



Ethan Berkowitz, Mayor

2017 Stormwater Outfall Monitoring Report

APDES Permit No. AKS-052558

MUNICIPALITY OF ANCHORAGE
WATERSHED MANAGEMENT PROGRAM

FINAL REPORT

December 2017

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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

and

Kinnetic Laboratories, Inc.
704 West 2nd Avenue
Anchorage, AK 99501

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List of Acronyms

°C	Degrees Celsius
%	Percent
ADEC	Alaska Department of Environmental Conservation
ADOT&PF	Alaska Department of Transportation and Public Facilities
APDES	Alaska Pollutant Discharge and Elimination System
AWC	Anchorage Waterways Council
AWQS	Alaska Water Quality Standard
AIA	Anchorage International Airport
BETX	Benzene, Ethylbenzene, Toluene, and Xylenes
BMPs	Best Management Practices
BOD ₅	Biological Oxygen Demand (5 Day)
COC	Chain of Custody
CI	Commercial Industrial
Cu	Copper
DO	Dissolved Oxygen
EPA	U.S. Environmental Protection Agency
FC/100 mL	Fecal Coliform units
hr	Hour
HGDB	Hydro-Geographic Database
Jewel	Rain Gauge at East Northern Lights Boulevard
LCS/LCSD	Laboratory Control Samples and Duplicates
mg/L	Milligrams/Liter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MS4	Municipal Separate Storm Sewer System
NOAA	National Oceanic and atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
OGS	Oil/Grit Separator
PAHs	Polycyclic Aromatic Hydrocarbons
QA/QC	Quality Assurance/Quality Control
QAP	Monitoring, Evaluation, and Quality Assurance Plan
SMRC	Stormwater Managers Resource Center.
Spencer's	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
TPAH	Total Polycyclic Aromatic Hydrocarbons
TSS	Total Suspended Solids
ug/L	Micrograms/Liter
USGS	U.S. Geological Survey

1.0 Introduction

1.1 Background

The U.S. Environmental Protection Agency (EPA) issued the Municipality of Anchorage (MOA) and the Alaska Department of Transportation and Public Facilities (ADOT&PF) a Municipal Separate Storm Sewer System (MS4) permit under the National Pollutant Discharge Elimination System (NPDES) in 1999. EPA re-issued the permit (Permit No. AKS-052558) in October 2009 (EPA 2009). The 2009 permit included a requirement to conduct stormwater outfall monitoring at ten priority outfalls. The MOA has taken the lead role in implementing the monitoring requirements of the permit. Since permit issuance, EPA has delegated the NPDES stormwater program for Alaska to the Alaska Department of Environmental Conservation (ADEC) who now oversees its implementation and administration under the Alaska Pollutant Discharge Elimination System (APDES). The 2009 permit expired in January 2015 and was reissued in June 2015 with an effective date of August 1, 2015 (ADEC 2015a). The stormwater outfall monitoring requirements in the 2015 permit are, for the most part, identical to those contained in the prior permit, which require continued monitoring at the ten priority stormwater outfalls.

The APDES MS4 permit establishes minimum control measures requiring the co-permittees to develop programs and policies and to implement actions designed to prevent and control contaminants entering publicly owned storm sewer systems. The permit also identifies a number of objectives for monitoring, of which the stormwater outfall monitoring is one component. The objective most relevant to stormwater outfall monitoring is to broadly identify fecal coliform and petroleum product loading from stormwater. To accomplish this objective, a variety of land uses must be examined to ensure representative water quality conditions across the MS4 area are included in the monitoring program. This report and the data collected during the monitoring program fulfill the annual outfall monitoring objectives of the APDES Permit. The stormwater sampling conducted during 2017 is the third year of monitoring that was performed for the reissued permit, but the seventh year of monitoring ten outfalls.

1.2 Stormwater Definition

The EPA has recognized urban stormwater as a major contributor to pollution of the nation's streams, rivers, and lakes. EPA and delegated states are using the NPDES MS4 permit to control pollutants from urban stormwater to the maximum extent practicable. Urban stormwater can contribute to the degradation of the quality of water bodies. Runoff from precipitation and snowmelt events can transport contaminants from impervious surfaces such as driveways, sidewalks, and roads, and semi-pervious surfaces such as lawns, into the local water bodies. Most stormwater runoff flows into a storm sewer system or directly to a water body, often without receiving treatment to remove the pollutants.

In issuing the Anchorage MS4 permit, EPA recognized that a number of water bodies in the greater Anchorage watershed were categorized as impaired under section 303(d) of the Clean Water Act. For 14 impaired water bodies (13 for elevated concentrations of fecal coliform and one for petroleum hydrocarbons), ADEC has developed (and EPA has approved) Total Maximum Daily Load (TMDL) plans to improve water quality to the extent that the waters will meet the current standards. The TMDLs identify stormwater runoff as a contributor of fecal coliform and petroleum

hydrocarbon contamination to the water bodies and establish reduction goals for concentrations of these pollutants in stormwater.

1.3 Goals and Objectives of Monitoring Program

The monitoring elements of the MS4 permit are designed to identify sources of stormwater pollution such as fecal coliform and petroleum hydrocarbons, monitor the effectiveness of best management practices (BMPs), and monitor the status of stormwater outfalls and receiving waters. The goal of the stormwater outfall monitoring component of the permit is to obtain sufficient data to characterize the quality of the stormwater runoff for pollutants identified in the permit. By monitoring the same outfalls over a multi-year period, the results should provide a qualitative characterization that meets the objectives identified in the APDES Permit and Fact Sheet (ADEC 2015a and 2015b).

The stormwater outfall monitoring program measured pollutants and pollutant indicators during precipitation events that generated runoff at ten high priority outfall sites. This monitoring program will allow MOA to meet the ADEC objectives specified in the permit. As specified in the permit, the outfall monitoring should address the following objectives:

- Broadly estimate the annual pollutant loading of fecal coliform and petroleum products discharged to specific watersheds from the MS4s
- Assess the effectiveness and adequacy of existing stormwater controls in reducing fecal coliform bacteria and petroleum products
- Identify and prioritize portions of the MS4 that need additional controls.

2.0 Explanation of Report Organization

This report is divided into the following sections:

- Introduction, background information, and goals and objectives of the program
- Summary information about the field phase of the project including project design, site selection and descriptions, parameters to be measured, field and laboratory procedures, deviations from the monitoring and quality assurance plan, and summary of quality assurance/quality control (QA/QC) results
- Tabular and graphical summaries of the data along with a discussion of results
- Summary and preliminary conclusions
- References
- Appendices that include: field photographs, laboratory data reports, field and laboratory data validation summary, and completed field log forms.

3.0 Monitoring Program

3.1 Sampling Design

Beginning in the summer of 2011 and annually thereafter, ten priority outfalls were sampled four times each summer when there was sufficient precipitation to generate runoff (typically, 0.1 to 0.25 inches depending upon percent impervious land use within the watershed). For planning purposes, 0.1 inches of rain was the trigger for a potential sampling event. Monitoring of the outfalls included both in situ measurements and discrete grab samples submitted for laboratory analyses. Appendix B (*Stormwater Outfall Monitoring Plan*) of the *Monitoring, Evaluation, and Quality Assurance Plan* (QAP; MOA 2012) stipulates that the following parameters are to be collected at each outfall: flow, dissolved oxygen (DO), pH, temperature, turbidity, 5-day biochemical oxygen demand (BOD₅), fecal coliform, and total suspended solids (TSS). Samples from outfalls located in predominantly commercial, industrial, or paved collector, (arterial streets or parking lots) were also analyzed for total aromatic hydrocarbons (TAH) and polycyclic aromatic hydrocarbons (PAH) to allow calculation of the summed parameter of total aqueous hydrocarbons (TAqH). In addition, the supplemental measurement of specific conductance was obtained with the field parameters. Beginning in 2016, supplemental samples for dissolved copper (Cu) and water hardness were also collected at all ten outfalls.

3.2 Monitoring Site Selection and Descriptions

The stormwater outfall monitoring prescribed in the permit requires the monitoring of specific water quality parameters and flow four times each year at ten separate locations. To meet the permit objectives, the outfalls selected represent a diversity of land uses. The MOA developed a selection process for identifying the ten outfalls as the highest priority locations from a list of 30 medium to high priority outfalls. Criteria identified by the MOA for targeted monitoring within the Anchorage Basin are as follows:

- Include a variety of land uses
- Include storm drains that discharge to water quality impaired (303(d)-listed) streams
- Experience approximately the same annual precipitation
- Be geographically diverse while allowing relatively easy access to all outfalls during a single rainfall event.

To meet these criteria, MOA selected a portion of the MS4 that extends from C Street on the west to Lake Otis Parkway on the east, and from the northern portion of the Chester Creek watershed to the southern edge of the Furrow Creek Watershed. The targeted area included substantially urbanized portions of the watershed tributary to Chester Creek, Furrow Creek, Little Campbell Creek, and Campbell Creek. These four streams are impaired for fecal coliform and have an approved TMDL, and therefore meet one of the permit objectives (ADEC 2004a, 2004b, 2005, and 2006; and AWC 2014).

Within the target area, the MOA identified priority outfalls that represent homogeneous land use subbasins, heterogeneous land use subbasins, and subbasins with and without oil/grit separator (OGS) devices. This diversity of land uses and structures meets the permit objectives of broadly

quantifying pollutant loads and assessing effectiveness of existing best management practices (BMPs).

Monitoring data from subbasins meeting the four different conditions (homogeneous land use, heterogeneous land use, with OGS and without OGS) serve different functions.

Conditions for the subbasins with a homogeneous land use:

- Data identify specific pollutants originating from a predominant land use that require additional controls. Controls tailored to a specific land use could be utilized in those watersheds.
- Data from basins with homogeneous land uses are appropriate for developing loading estimates for fecal coliform and TAH, as described below.
- Fecal coliform, TAH, and TAqH data are appropriate for comparison with receiving water quality criteria. Since water quality criteria do not apply directly to stormwater, the criteria serve as benchmarks.
- Fecal coliform data are appropriate for comparison with TMDL reduction goals for fecal coliform to determine improvement over time.

Conditions for subbasins with heterogeneous land uses:

- Data are useful when developing loading estimates of fecal coliform and petroleum hydrocarbons.
- Data were also to be used to assess pollutants originating across land uses that may require additional controls, and additional BMP controls that could be applied across the basin.
- Fecal coliform and petroleum hydrocarbon data are appropriate for comparison with receiving water quality criteria.
- Fecal coliform data are appropriate for comparison with TMDL reduction goals for fecal coliform to determine improvement over time.

Conditions for subbasins with or without OGS systems:

- Data are used to assess the effectiveness of the OGS systems and determine whether additional OGS systems could be installed to improve stormwater quality.
- Petroleum hydrocarbon data are appropriate for comparison with receiving water quality criteria.

MOA used its hydro-geographic database (HGDB) and other municipal geographic data to select subbasins with the aforementioned characteristics. Application of this selection process resulted in the initial identification of ten priority outfalls. Following the pre-sampling field reconnaissance, it was determined that one of the selected outfalls (Node ID 299-20) exhibited severe corrosion within the outfall pipe and was not suitable for sampling. An alternate outfall within the Little Campbell Creek Watershed, having the same land use and BMP characteristics (Station ID SWM02, Node ID 847-1), became the tenth sampling site. Station SWM02 was sampled from 2011 thru 2016, but was subsequently replaced by Station SWM12 in 2017 since it was found that the original site was not truly representative of the land use category as a result of influence of stream flow from Little Campbell Creek (Table 1). The other outfall replaced in 2017 was SWM01,

which was discontinued due to inconsistent flow and the small size of the drainage area. The replacement outfall, SWM11, is located within the Furrow Creek drainage area, has a larger drainage area, and represents the residential land use category.

To facilitate sample labeling and simplify outfall identification in the field per the *Monitoring, Evaluation and Quality Assurance Plan* (MOA 2012), the outfall stations were sequentially numbered from south to north along the sampling corridor (SWM01 thru SWM10) with SWM11 and SWM12 being added to the original numbering scheme. Table 1 provides the characteristics of each outfall including physical location, geographic location, outfall dimensions, acreage of subbasin, and percent impervious surface of the subbasin. An overview map (Figure 1) shows the ten current monitoring outfall locations along with the subbasins for each watershed. Figures 2-8 are larger scale maps that clearly show land use types for each of the outfalls and subbasins.

SWM03 and SWM04 are located near Sylvan Drive and drain a residential area east of Campbell Creek. Though these outfalls are close together, their drainage areas are vastly different. 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 industrial area to the north and mixed land use area to the south, 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 commercial and residential area south of Chester Creek. SWM11 is located at Johns Road and Botanical Circle and drains a large residential area that flows into Furrow Creek. SWM12 drains the commercial and industrial area near the Old Seward Highway and represents the inflow to the Lynwood retention basin.

Table 1. Top Ten Priority and Replacement Outfalls.

Station ID	Subbasin ID	Outfall Node ID	Watershed	Contributing Land Use*	OGS Present	Priority Rank	Latitude	Longitude	Outfall Diameter (inch)	Drainage Acreage	Percent Impervious
Identified Priority Outfalls											
SWM03	1224a	1224-1	Campbell	R	Yes	3	61° 09.548'	-149° 52.443'	36	92.78	70.05
SWM04	1224b	1224-2	Campbell	R	Yes	6	61° 09.545'	-149° 52.451'	18	20.10	31.78
SWM05	805	207-1	Campbell	CI	Yes	1	61° 10.202'	-149° 52.326'	24	58.34	75.41
SWM06	219	314-22	Chester	R	Yes	2	61° 11.996'	-149° 50.750'	26	33.81	37.26
SWM07	507	484-1	Chester	CI	No	8	61° 12.100'	-149° 52.114'	24	50.17	87.68
SWM08	549	86-1	Chester	M	No	6	61° 12.095'	-149° 52.114'	42	354.62	68.94
SWM09	132	499-1	Chester	CI	Yes	4	61° 12.176'	-149° 52.554'	24	40.04	53.65
SWM10	554	525-2	Chester	M	No	5	61° 12.161'	-149° 52.486'	24	47.51	74.62
Medium Priority Replacement Outfalls											
SWM11	1103	348-3	Furrow Cr.	R	No	-	61° 06.448'	-149° 52.734'	36	86.32	38.58
SWM12	1449	1454-1	Campbell	CI	No	-	61° 09.758'	-149° 52.525'	24	111.68	59.51

* R = Residential; CI = Commercial and Industrial; M = Mixed

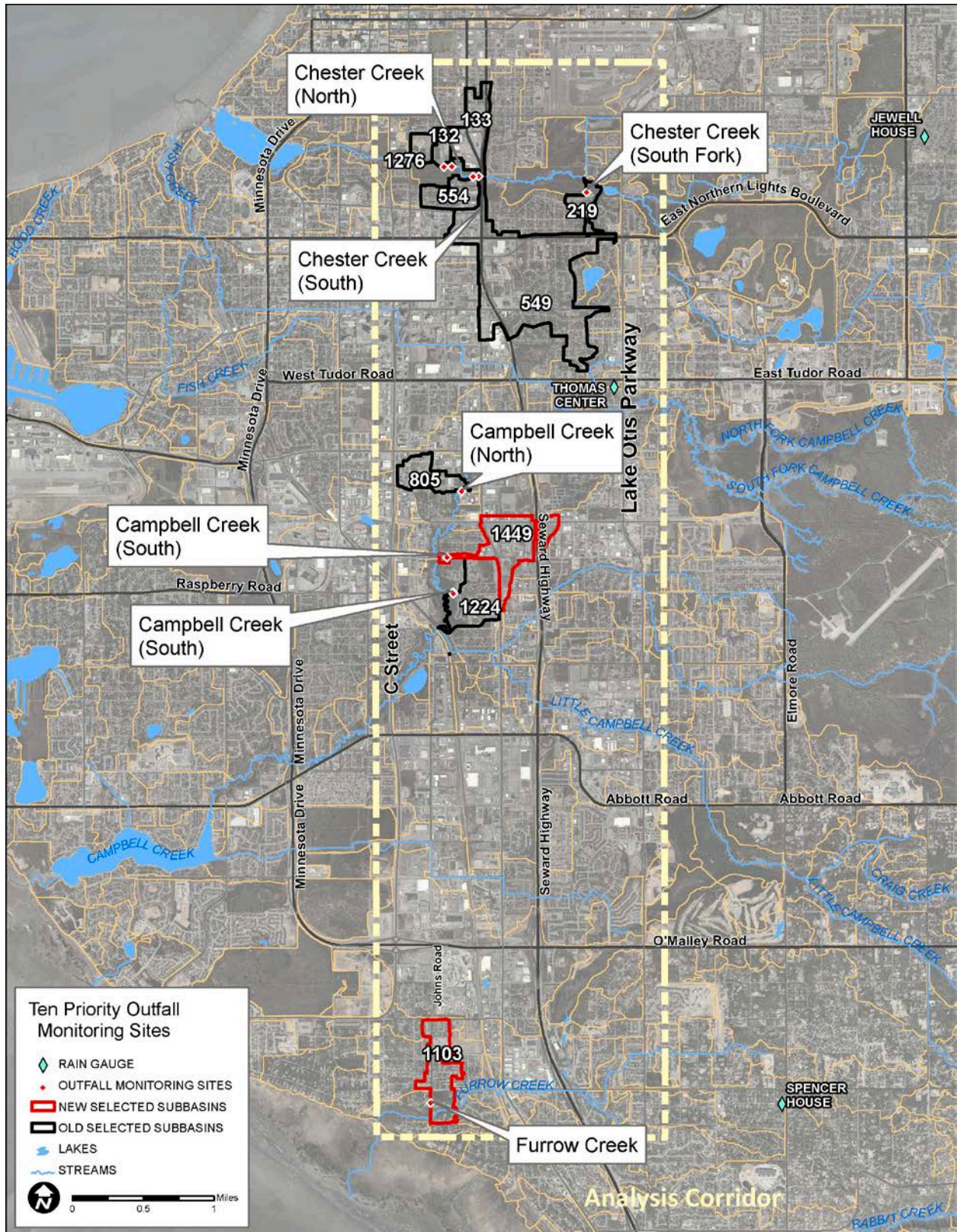


Figure 1. Overview Map of the Ten Final Outfall Monitoring Sites and Subbasins.



Figure 2. Outfalls SWM03 and SWM04, Fairweather Loop off Sylvan Drive (Campbell Creek).

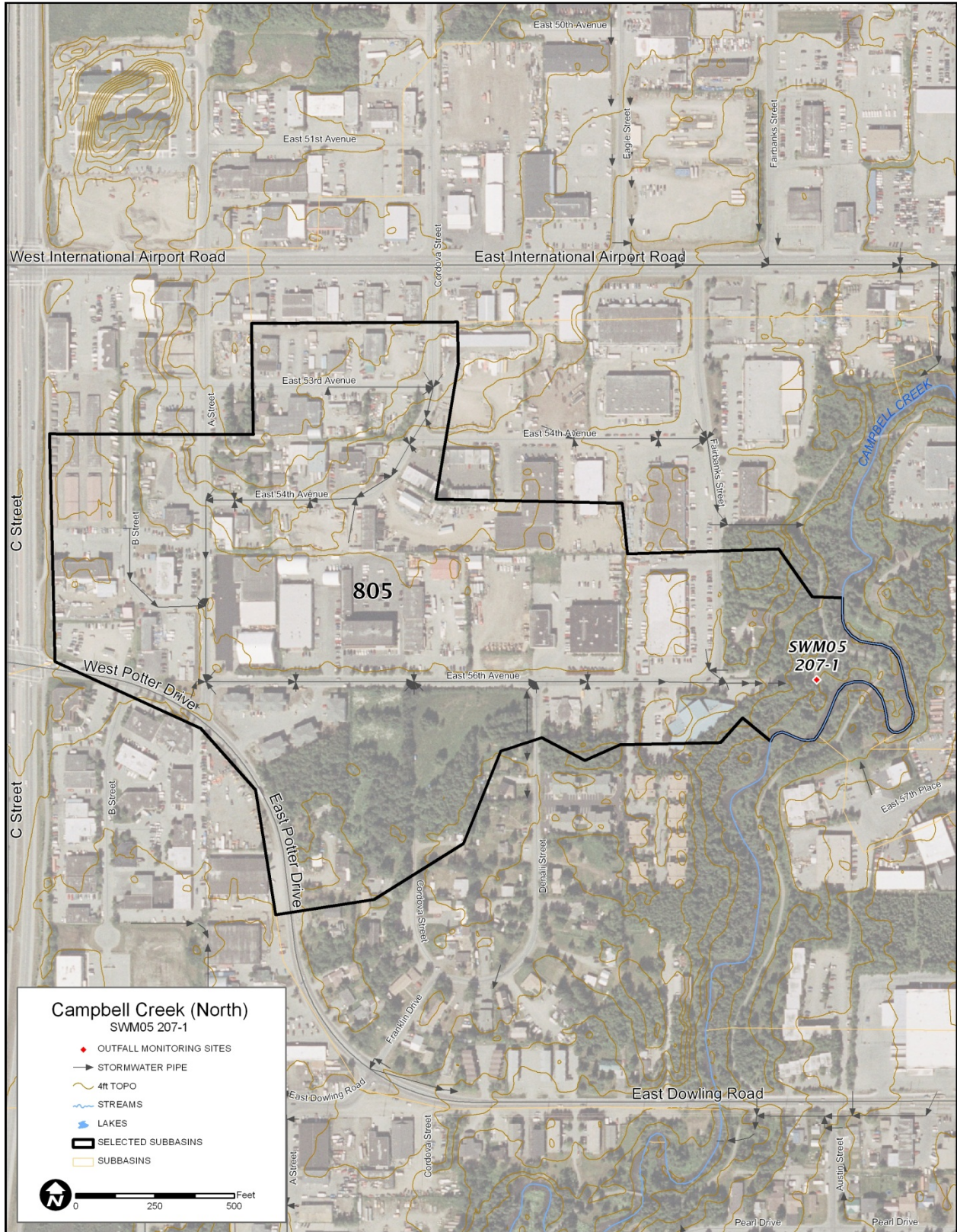


Figure 3. Outfall SWM05, East 56th Avenue (Campbell Creek).

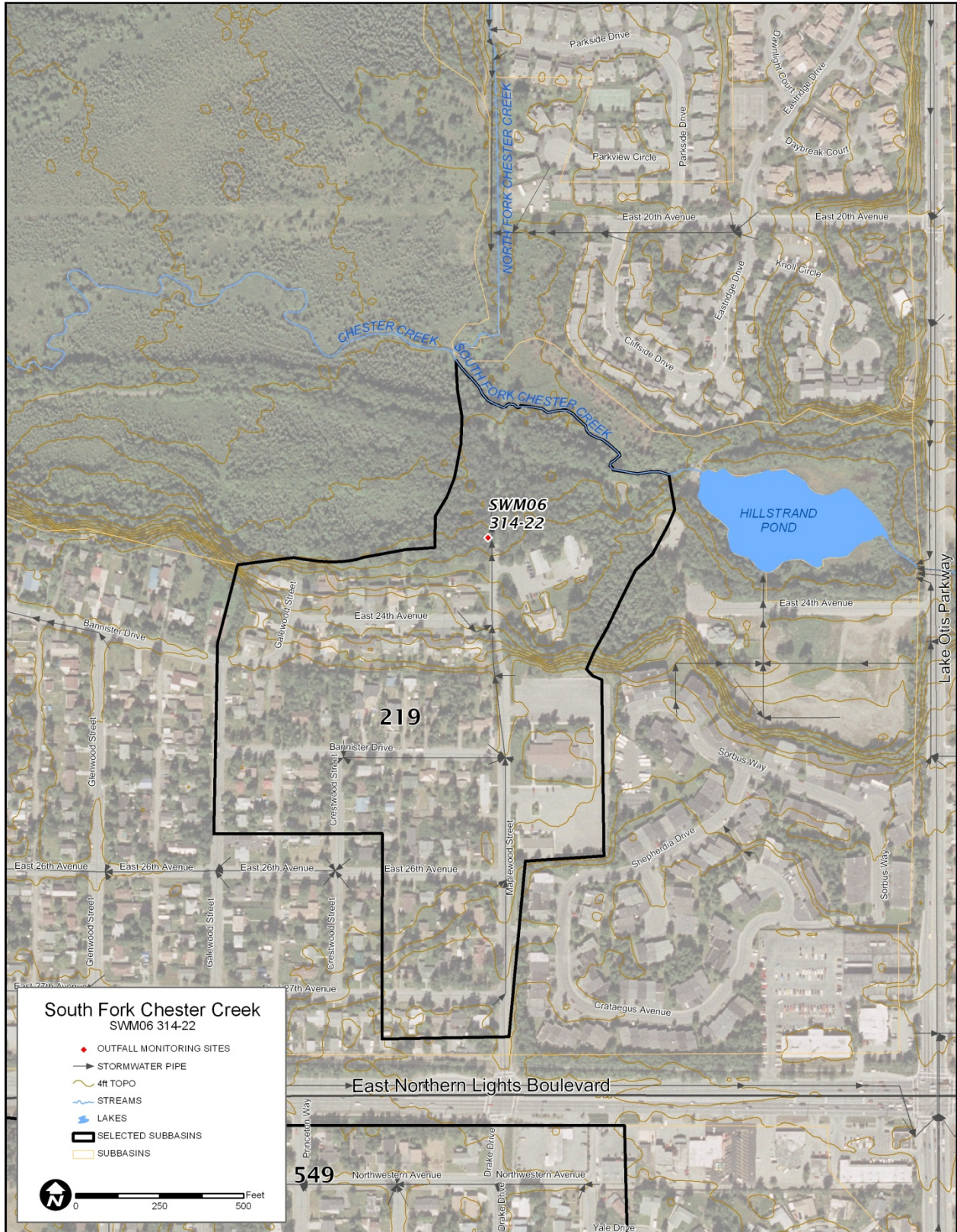


Figure 4. Outfall SWM06, Maplewood Street (South Fork Chester Creek).

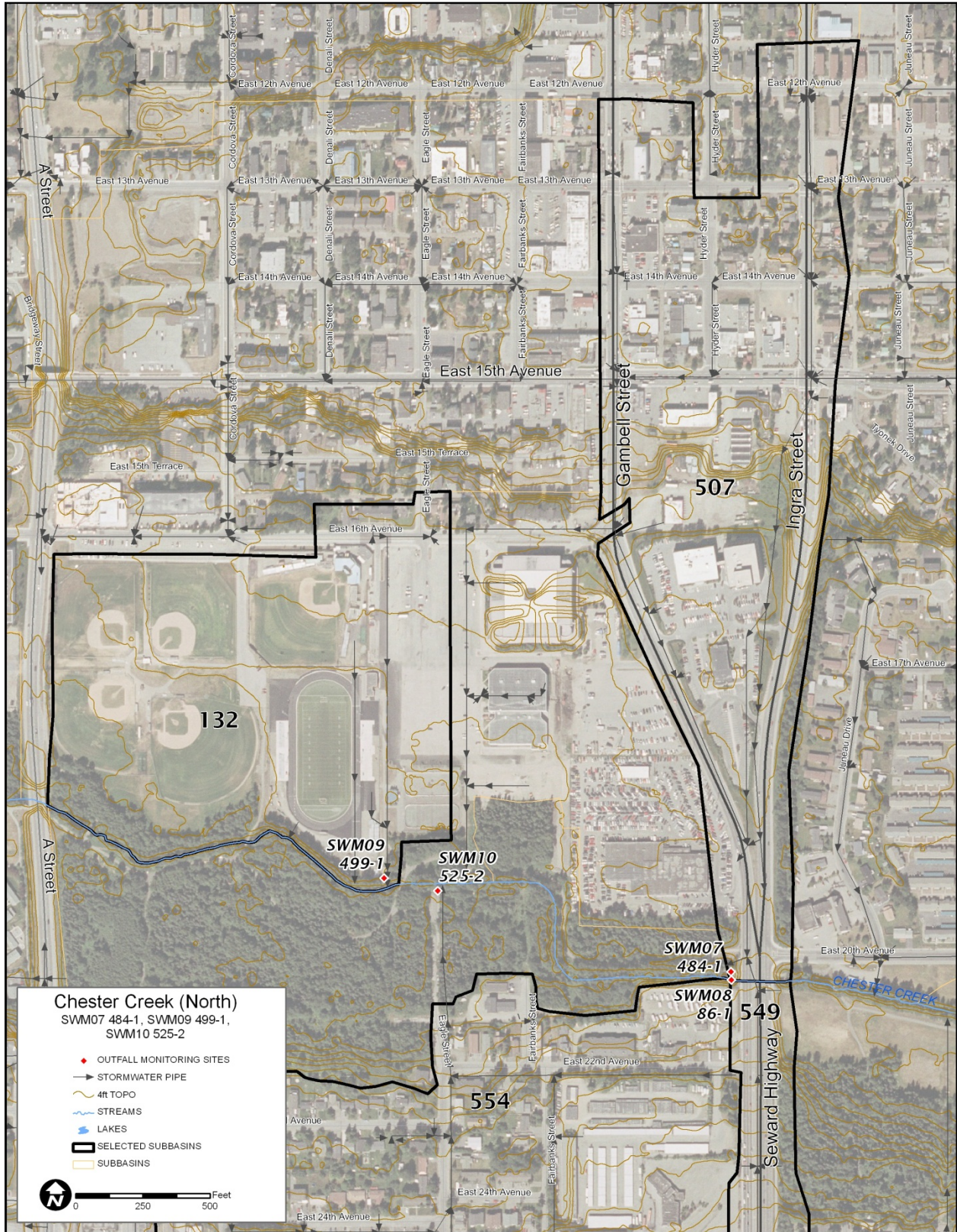


Figure 5. Outfalls SWM07, SWM09, and SWM10 (Chester Creek).

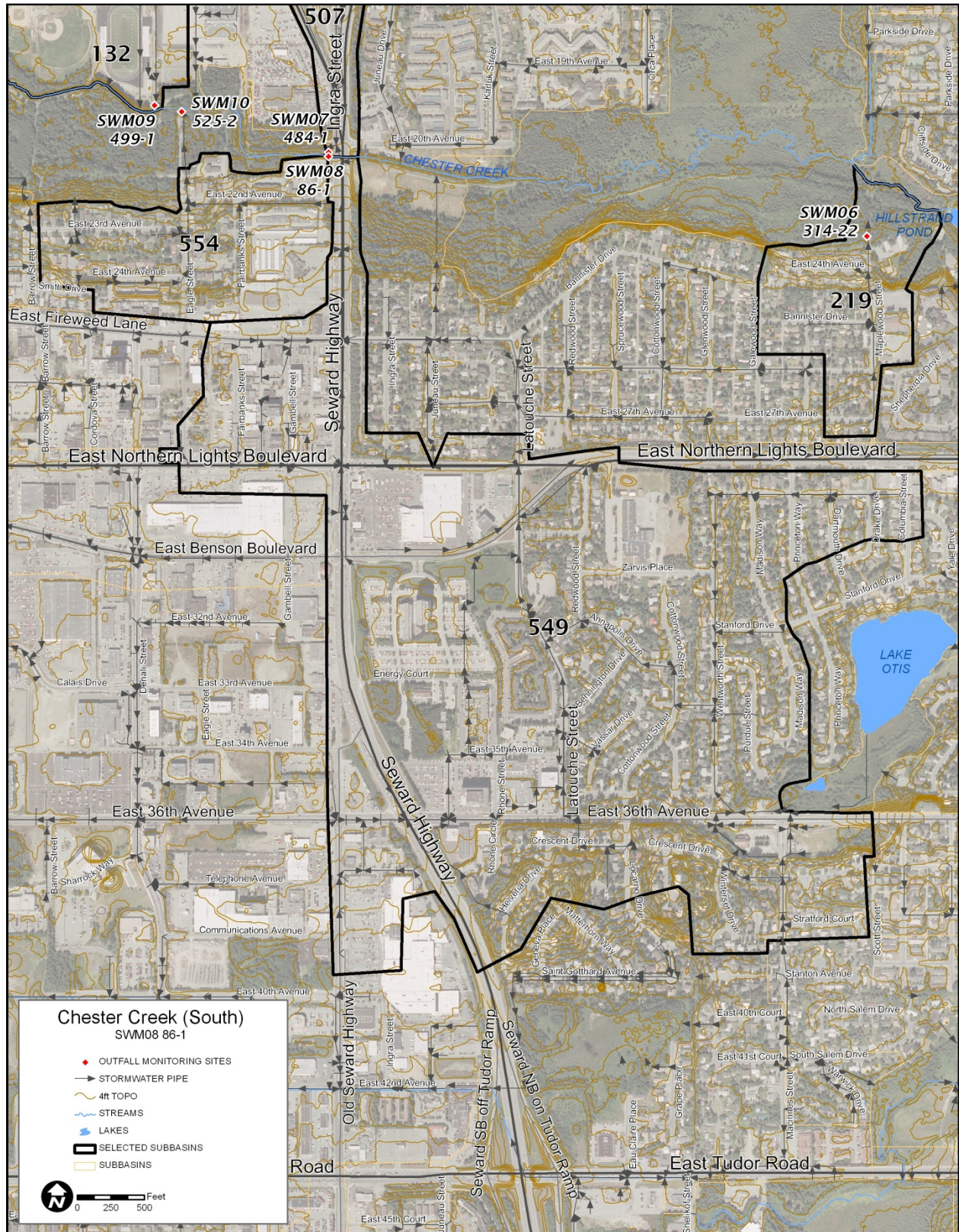


Figure 6. Outfall SWM08, New Seward Highway (Chester Creek).

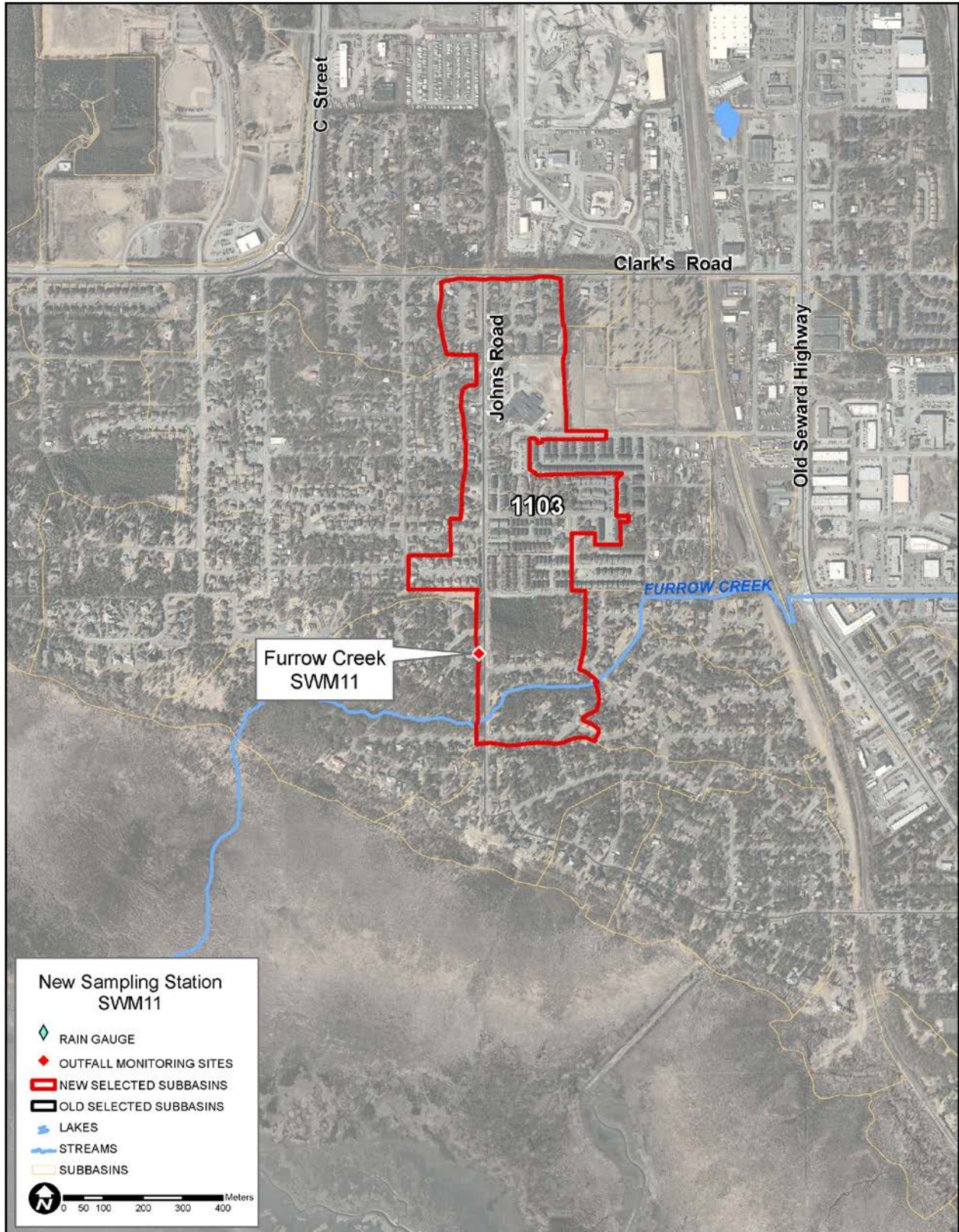


Figure 7. Outfall SWM11, Johns Road and Botanical Circle (Furrow Creek).



Figure 8. Outfall SWM12, Lynwood Retention Pond (Campbell Creek).

3.3 Measured Parameters

Parameters measured during stormwater outfall monitoring are shown in Table 2. The table includes sample type, measurement type (field or laboratory), analysis method, and purpose of monitoring. Measurement quality objectives for each parameter including precision, accuracy, sensitivity, and measurement range are in the program’s QAP (MOA 2012). In addition to the parameters listed in Table 2, field observations were recorded at each outfall including any evidence of oily sheen, scum, odor, detritus, floating material, water color and clarity, deposits or stains, vegetation, and any other pertinent observations.

Table 2. Measured Parameter, Type, Purpose, and Method of Analysis.

Parameter	Type of Sample*	Measurement Type	Method	Purpose
Flow	IR	Field	Flow meter, or bucket	Characterize flow
Specific Conductance	IR	Field	EPA 120.1/ YSI 556	Stormwater quality
DO	IR	Field	EPA 360.1/ YSI 556	Stormwater quality
pH	IR	Field	EPA 150.2/ YSI 556	Stormwater quality
Temperature	IR	Field	SM2550B/ YSI 556	Stormwater quality
Turbidity	IR/G	Field	EPA 180.1M/ Hach 2100	Stormwater quality
BOD ₅	G	Laboratory	SM 5210 B	Stormwater quality
Fecal Coliform	G	Laboratory	SM 9222D	Stormwater quality & loading
TSS	G	Laboratory	SM 2540D	Stormwater quality
TAH	G	Laboratory	EPA 624	Stormwater quality & loading
TAqH	G	Laboratory	EPA 625 + EPA 624	Stormwater quality & loading
Dissolved Copper	G	Laboratory	EPA 200.8	Stormwater quality
Total Hardness	G	Laboratory	EPA 200.8	Stormwater quality

* IR = instantaneous recording of field analysis; G = grab sample for analysis; M = modified for field use

Three tipping bucket rain gauges installed within the monitoring area recorded precipitation throughout the monitoring period. The rain gauges were located along the north-south sampling corridor in order to provide a good representation of rainfall within each of the sampled subbasins (refer to Figure 1 for rain gage locations).

Table 3 identifies the parameters monitored at each outfall location. The commercial industrial (CI) land use categories in the table represent predominantly commercial and industrial areas with paved collectors, arterial streets, and parking lots. Outfalls with watersheds dominated by these land uses are those most likely to contribute petroleum hydrocarbon pollutants to stormwater. TAH and TAqH were collected at these locations in addition to the other parameters collected at every location. For this monitoring program, two CI subbasin categories were selected that had existing OGS systems, and two others were selected that did not have OGS systems.

Table 3. Parameters Measured at each Subbasin Outfall.

Station ID	Outfall ID	Watershed	Contributing Land Use*	OGS Present?	Field Parameters						Lab Samples						
					Flow	Cond	pH	Temp	DO	Turb	BOD ₅	FC	TSS	Hardness	Diss. Cu	TAH	TAqH
SWM03	1224-1	Campbell Cr	R	Yes	x	x	x	x	x	x	x	x	x	x	x		
SWM04	1224-2	Campbell Cr	R	Yes	x	x	x	x	x	x	x	x	x	x	x		
SWM05	207-1	Campbell Cr	CI	Yes	x	x	x	x	x	x	x	x	x	x	x	x	x
SWM06	314-22	Chester Cr	R	Yes	x	x	x	x	x	x	x	x	x	x	x		
SWM07	484-1	Chester Cr	CI	No	x	x	x	x	x	x	x	x	x	x	x	x	x
SWM08	86-1	Chester Cr	M	No	x	x	x	x	x	x	x	x	x	x	x		
SWM09	499-1	Chester Cr	CI	Yes	x	x	x	x	x	x	x	x	x	x	x	x	x
SWM10	525-2	Chester Cr	M	No	x	x	x	x	x	x	x	x	x	x	x		
SWM11	348-3	Furrow Cr	R	No	x	x	x	x	x	x	x	x	x	x	x		
SWM12	1454-1	Campbell Cr	CI	No	x	x	x	x	x	x	x	x	x	x	x	x	x

*R-Residential, CI-Commercial/Industrial, M-Mixed

3.4 Field Sampling Procedures

Monitoring of precipitation throughout the summer rainfall season was done in order to capture four storms that were representative of typical Anchorage rainfall conditions. Water sampling was conducted during storm events that were both expected to create runoff in the MS4 area and that met antecedent dry weather conditions. Typically, rain events yielding greater than 0.1 inch within a 24-hour (hr) period were sufficient to generate runoff at all sites. Therefore, a minimum of 0.1 inches of rain was required before targeting an event. In addition, all storm events were to be preceded by a relatively dry period. A dry period is defined as rainfall of <0.1 inches in the preceding 24-hr period.

Once a storm event was identified for sampling, the field crew prepared field sampling equipment and laboratory bottles for sampling. All 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. Prior to departing for the field, all bottles were labeled with station location, sample number, number of bottles, and analysis type and method. Date, time, and sampler’s initials were added in the field.

The field sampling team consisted of two people to address safety concerns and to allow one person to be the designated recorder while the second person performed measurements and conducted the grab sampling. Upon arriving on site at the outfall, the field team took flow measurements and placed the YSI 556 multi-probe into the outfall flow in order to allow the probes to equilibrate for at least three minutes prior to taking any measurements.

An acoustic Doppler flow meter and staff gauge were used to collect flow measurements. The flow meter measures the average velocity of the outfall pipe. 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 crew measured dissolved oxygen (DO), specific conductance, pH, and temperature with a YSI 556 multi-probe system. Turbidity was measured in the field by collecting a discrete sample that was analyzed on site with a portable Hach 2100P/Q turbidimeter. All water quality measurements were obtained from the water flowing out of the end of pipe prior to any mixing with the receiving water body. All field measurements were recorded on project-specific field log forms that were bound in the project field log books along with field instrument calibration logs (refer to Appendix D).

The field crew obtained the water samples for BOD₅, TSS, fecal coliform, dissolved copper, total hardness, TAH, and PAH in laboratory-provided bottles. The water quality samples were collected from the water flowing out the outfall, and extra care was taken not to disturb any accumulated sediment 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 1-Liter (L) 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 crew recorded visual observations at each outfall location.

The field crew conducted replicate field measurements and laboratory analyses at a rate of 15 percent (%) per sampling event. This resulted in two additional measurements for all parameters except TAH and TAqH. TAH and TAqH required only one additional field measurement since they are collected at fewer outfalls. Additional water for TAH and TAqH was collected at one station to allow the laboratory to perform matrix spike/ matrix spike duplicate (MS/MSD) analyses. TAH analyses also included a trip blank sample, provided by the laboratory, that accompanied the sample bottles in the field.

Precipitation was recorded using a tipping bucket rain gauge and data logger recording in 0.01-inch increments. During precipitation events, the collection cup in the gauge collects precipitation until it reaches the equivalent of 0.01 inches of precipitation where upon the bucket tips, triggering a reed switch and recording an event with a time stamp. These events are stored in the data logger and downloaded into a computer program where they are summarized over different time intervals or graphed as a time series. Three rain gauges installed for this program were located at East Northern Lights Boulevard (“Jewel”), near Lake Otis Parkway and Tudor Road (“Thomas”), and in South Anchorage near Elmore and Huffman Roads (“Spencer’s”) that represent the northern, middle, and southern portions of the study area respectively. Selected rain gage locations bracket the study area, showing that the storm events were representative of the entire region and not confined to a restricted area in the analysis corridor. In addition, precipitation data collected by the National Weather Service at the Anchorage International Airport (AIA) was utilized to supplement the rain gauge data collected for this program.

3.5 Sampling Handling and Chain of Custody Procedures

BOD₅, TSS, fecal coliform, dissolved Cu, hardness, TAH, and TAqH samples were collected, preserved, and cooled for shipment to the laboratory as described in the QAP. SGS North America, Inc. 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 crew 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 all completed COCs are included with the laboratory data reports in Appendix B. When necessary, fecal samples were taken to the laboratory in two batches during the storm event to ensure the 6-hr holding time requirement was met.

3.6 Laboratory Analyses

The water quality constituents selected for this program were established based upon the requirements of MOA's APDES Stormwater Permit (AKS-052558). All analyses were conducted by SGS North America, Inc. SGS is certified to conduct such analyses. All analytical methods (refer to Table 2) were based upon approved EPA methodology and included all necessary QA/QC procedures and analyses as outlined in the methodology and detailed 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 this program included:

- Employing analytical chemists trained in the procedures and analytical methods to be conducted
- Adherence to documented procedures, EPA methods, and laboratory SOPs
- Calibration of analytical instruments
- Use of quality control samples, internal standards, surrogates, and standard reference material (SRMs)
- Complete 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.

3.7 Deviation from the QAP

The QAP called for flow measurements by either of two methods: installation of a temporary portable weir or by timing the collection of flow in a bucket of known volume. After performing the pre-sampling reconnaissance in 2011 it was determined that only one of the ten outfalls was amenable to collection of the flow in a bucket. For most outfalls, a vertical drop did not exist at the end of the outfall pipe where the discharge could be collected with a bucket. Likewise, due to the varying outfall sizes, condition of the outfall pipes, and corrugated nature of most outfall pipes, that a temporary weir sized properly for the variable flow and that would seal properly to the end of pipe would be difficult and impractical to install in a timely manner. For these reasons, an acoustic Doppler flow meter and staff gauge were used to collect flow measurements.

3.8 QA/QC and Data Validation Results

QA/QC procedures were followed according to the QAP (MOA 2012). 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, TAqH, 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 being cooled to less than 6 °C before being delivered to the laboratory within a few hours of the sampling event. The holding times for all parameters tested were met and were analyzed within their respective holding time expirations.

The QA/QC officer validated all data reported by the laboratory. Data that was determined to be a biased low estimate was flagged based on low recovery rates from laboratory control samples. Any 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 C. Other QA/QC procedures included a field audit of the sampling in 2011 to ensure that all field protocols were followed and that protocols being used were sufficient. The field audit concluded that all protocols were followed and were sufficient. The field team was also required to QC all data at the end of each event to insure all data was collected and complete.

4.0 Results and Discussion

The 2017 stormwater monitoring at the ten longterm monitoring sites was initiated in July and comprised the seventh year of monitoring for the program. Approximately 7.7 inches of precipitation (including snow) had been measured in 2017 at the National Oceanic and atmospheric Administration (NOAA) National Weather Service's PANC weather station located at the AIA before the first event was sampled on 26 July (Figure 9). Four stormwater outfall monitoring events were conducted in 2017 as required by the *Stormwater Outfall Monitoring Plan* (MOA 2012) and the APDES Permit. Sampling events took place on 26 July, 16 August, 1 September, and 18 September and included successful sampling at all ten outfalls during each storm event. Rainfall amounts for May, June, and July in 2017 were very similar to their longterm averages, with May and July being slightly more and June being slightly less than the longterm mean precipitation for those months (Figure 9). The total rainfall in August was above average (4.11 inches) when compared to the longterm mean of 3.25 inches and the longterm maximum of 9.77 inches; this was the highest monthly precipitation for the year. For September, the recorded rainfall was below average (2.47 inches) when compared to the longterm average of 2.99 inches (Figure 9).

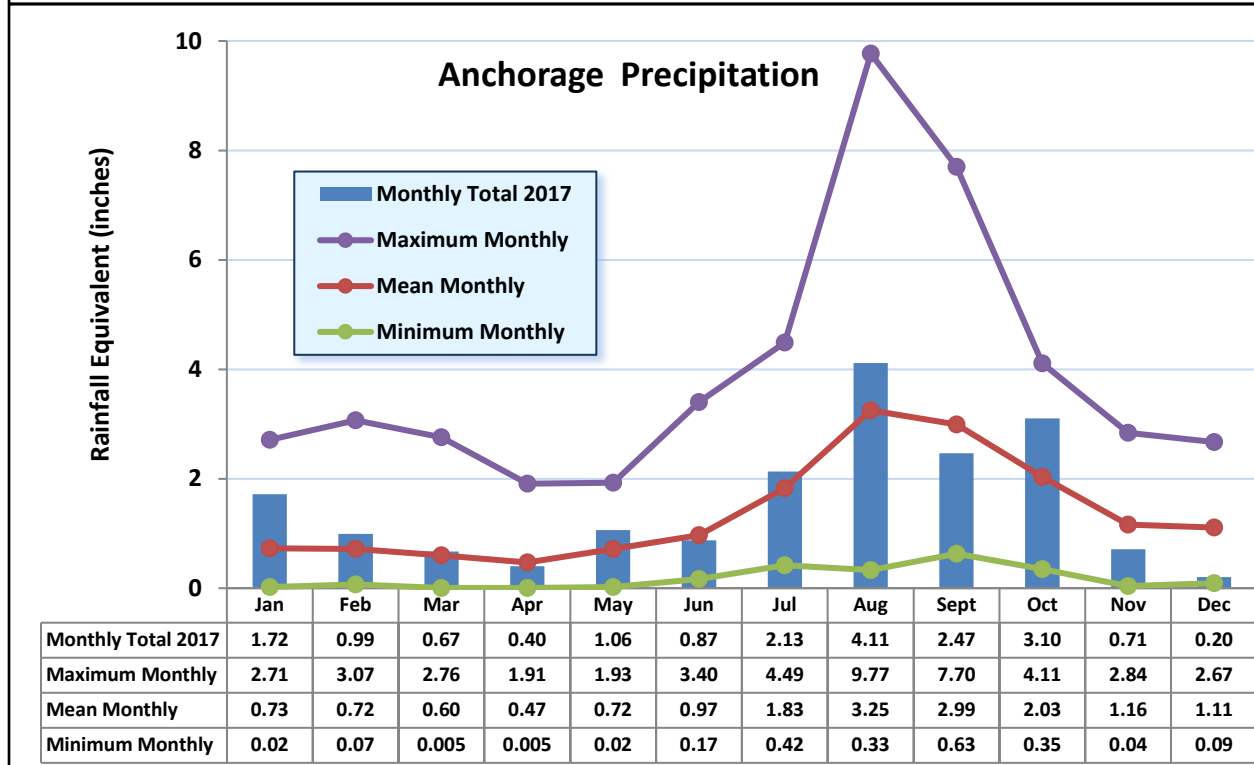
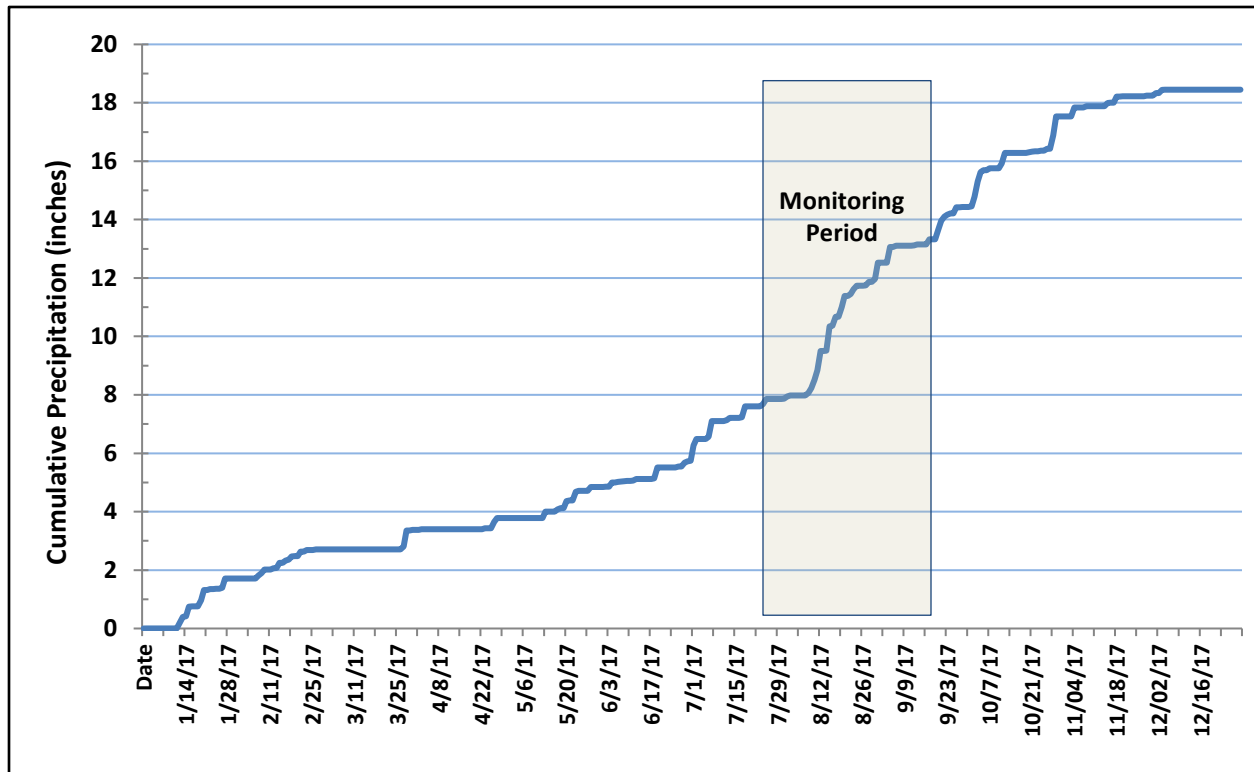
4.1 Precipitation

A total of four events were sampled in 2017 starting on 26 July and ending on 18 September. Total rainfall as measured at PANC and the three stations in the monitoring area during each monitored event ranged from a low of 0.11 inches at Jewel during the third event to 0.83 inches at PANC during the second event. Rainfall during the first event was similar in size to the fourth event with relatively low precipitation ranging from 0.16 to 0.26 inches across the four rain gauges for both events (Table 4). A fair amount of variability was seen across the Anchorage watershed for most of the rain events (Table 4 and Figure 10).

Daily rainfall records are illustrated in Figure 10 for three rain gauges located along the sampling corridor. As in past years, rainfall data from the PANC weather station at the AIA were used to supplement the other rain gauges to provide a time series for the entire year and a comparison to the long term historic record (Table 4).

The first storm event took place on 26 July with rainfall ranging from 0.16 inches at Spencer's to 0.17 inches recorded at PANC and Thomas for that calendar day. The Jewel rain gauge had not yet been installed for the first storm event. Rainfall that was recorded within the study area during the preceding calendar day ranged from 0.05 to 0.09 inches which is within the <0.1 inch dry weather criteria. Sampling was initiated in 09:15 approximately 6 hrs after the beginning of the storm. Based on the recorded precipitation, the rainfall appeared to be fairly consistent across the Anchorage Bowl for the first event.

The second storm event occurred on 16 August with recorded rainfall ranging from 0.29 inches at Jewel to 0.83 inches at PANC. Rainfall that was recorded within the study area during the preceding calendar day ranged from 0.0 to 0.12 inches with one of the four gauges exceeding the <0.1 inch dry weather criteria. Sampling for the second event was initiated at 12:35 approximately 4 hrs after the beginning of the storm during a period when the rainfall was fairly heavy and corresponding flow rates at most stations were elevated.



Note: Data for 2017 is incomplete at this time and includes only the period of 1/1/17 through 12/6/17.

Figure 9. Cumulative, Monthly, and Historic Rainfall Measured at the PANC NOAA Weather Station. Snowfall Has Been Converted to Rain Equivalent.

Table 4. Anchorage Precipitation Data Seven Days Prior to Each Sampling Event.

Date	PANC NOAA Airport (inches)*	Thomas (inches)	Jewel (inches)	Spencer's (inches)
7/19/17	0.37	NR	NR	0.33
7/20/17	T	NR	NR	0.01
7/21/17	0	NR	NR	0
7/22/17	0	NR	NR	0
7/23/17	0	0	NR	0
7/24/17	T	0	NR	0.02
7/25/17	0.08	0.09	NR	0.05
7/26/17 (Event 1)	0.17	0.17	NR	0.16
8/9/17	0.09	0.17	0.22	0.22
8/10/17	0.16	0.13	0.16	0.07
8/11/17	0.29	0.27	0.28	0.34
8/12/17	0.33	0.59	0.49	0.93
8/13/17	0.66	0.53	0.52	0.32
8/14/17	0	0	0	0
8/15/17	0.01	0.05	0	0.12
8/16/17 (Event 2)	0.83	0.51	0.29	0.31
8/25/17	0.12	0.08	0.06	0.07
8/26/17	T	0.01	0	0.01
8/27/17	0	0	0	0.01
8/28/17	0.01	0	0	0
8/29/17	0.12	0.07	0.07	0.05
8/30/17	T	0	0.01	0
8/31/17	0.10	0.04	0	0.01
9/1/17 (Event 3)	0.56	0.36	0.11	0.31
9/11/17	T	0.01	0.03	0.07
9/12/17	T	0	0	0
9/13/17	T	0	0	0.01
9/14/17	0.04	0.08	0.07	0
9/15/17	T	0.01	0.01	0.01
9/16/17	T	0	0	0
9/17/17	T	0	0	0
9/18/17 (Event 4)	0.17	0.16	0.14	0.26

* T = Trace level measurement, NR = No record

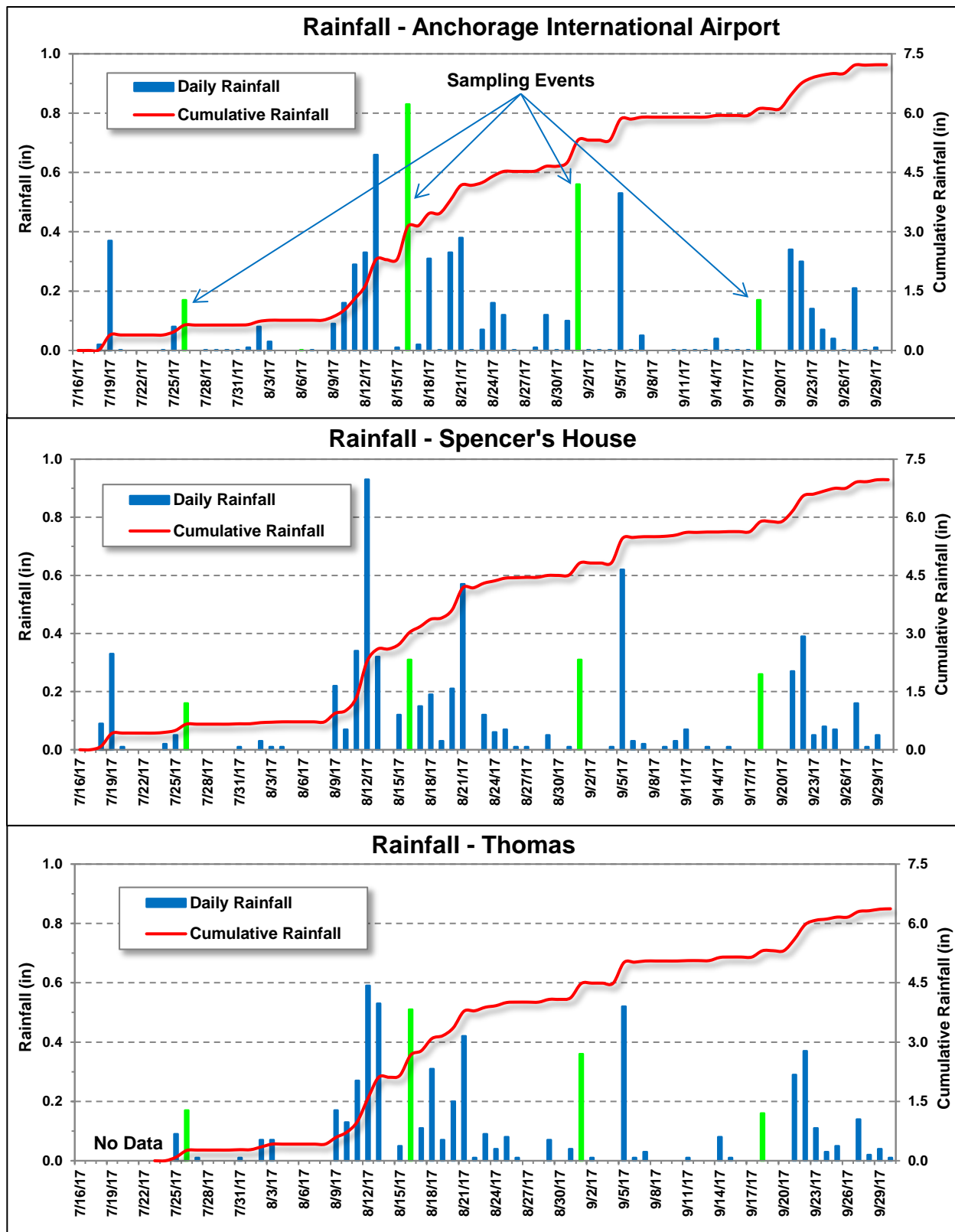


Figure 10. Rainfall Measured at the Three Anchorage Rain Gauges. (Note: Sampling days highlighted in green.)

The third event took place on 1 September. On the day of sampling, precipitation ranged from 0.11 inches at Jewel to 0.56 inches recorded at PANC with high variability across the Anchorage watershed. Rainfall that was recorded within the study area during the preceding calendar day ranged from 0.0 to 0.1 inches which is barely outside of the <0.1 inch dry weather criteria. Sampling for the third event was initiated at 09:20 approximately 8 hrs after the beginning of the storm during a period when the rainfall was light and had started to taper off. Heavy rainfall was experienced later during the sampling day.

The fourth monitoring event took place on 18 September. Precipitation for this event ranged from 0.14 inches at Jewel to 0.26 inches at Spencer's with fairly consistent rainfall across the Anchorage watershed. Precipitation on the preceding day ranged from 0.0 at the three project rain gauges to trace at PANC. Outfall monitoring for the fourth storm event began at 12:38 approximately 5 hrs after the beginning of the storm event with rainfall being fairly heavy prior to and during the sampling effort.

4.2 Field Measurements

The results of field measurements for flow, turbidity, DO, conductivity, pH, and temperature are shown graphically in Figures 11-16 and in Table 5. Where appropriate, field and laboratory measurements were compared against the most stringent Alaska Water Quality Standard (AWQS) numeric criteria for each parameter (refer to Table 9 for AWQS benchmarks used for comparisons). Most of these parameters exhibited similar trends to those observed for other stormwater programs in cooler climates.

Flow rates were highly variable between sites and storm events with SWM08 having the highest flow rates for two of the four storm events. Flow rates ranged from 0.16 gpm discharge at SWM06 during the third storm event to 2,259 gpm at SWM08 during the second storm event. The highest flows for five of the ten locations occurred during the second event on 16 August and for four of the ten locations during the fourth event in September. The one remaining location (SWM03) had the highest flow during the third storm event. This high variability between stations and events reflects both the spatial and temporal variability that was seen in all the precipitation records.

Mean turbidity levels ranged from a low of 10.9 Nephelometric Turbidity Units (NTU) at SWM04 to a high of 184.5 NTU at SWM07 which also had the highest turbidities for two of the four storm events. SWM12 had the highest turbidity levels for the two remaining storm events. The elevated turbidity was also generally evident in TSS samples taken for laboratory analysis at the same locations. Overall, large differences between outfalls are expected for turbidity since this parameter is highly dependent on the drainage area and is a function of the type of useage, percent impervious surfaces, amount of disturbed land from construction and other activities, drainage slope, flow rate, and other factors.

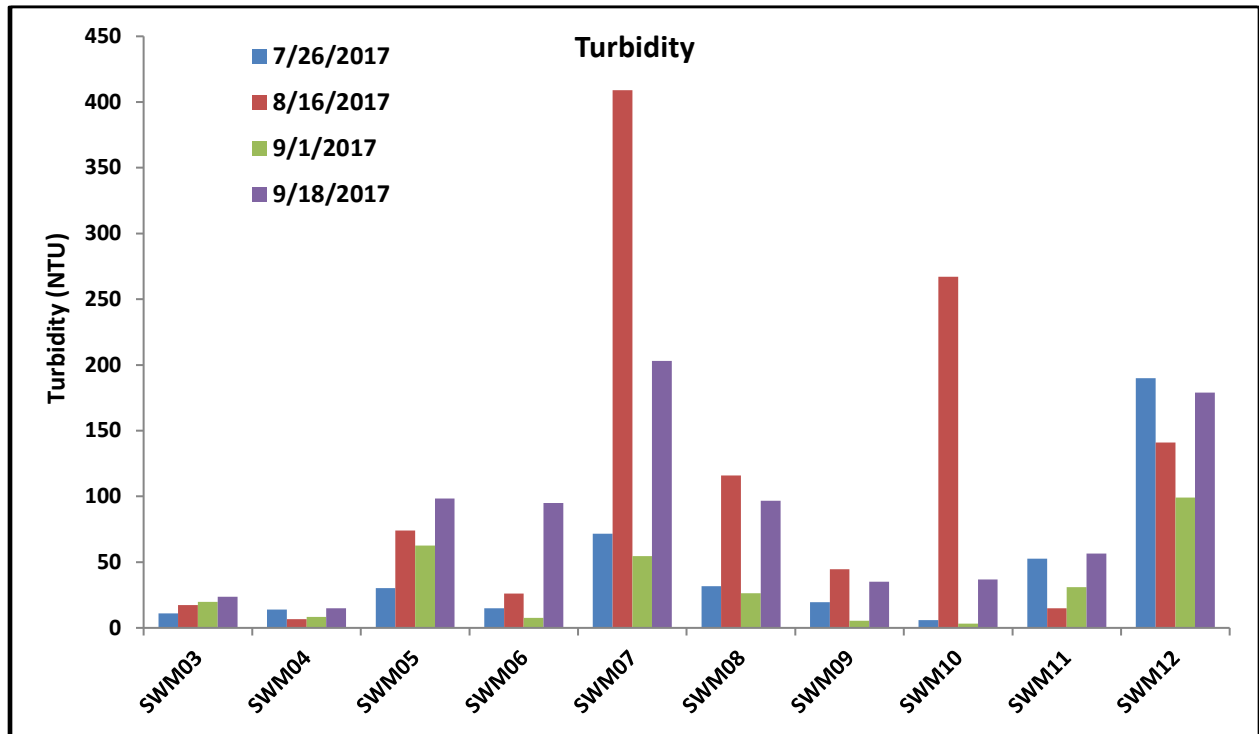


Figure 11. Flow Rates Measured at Monitoring Sites During all Four Events.

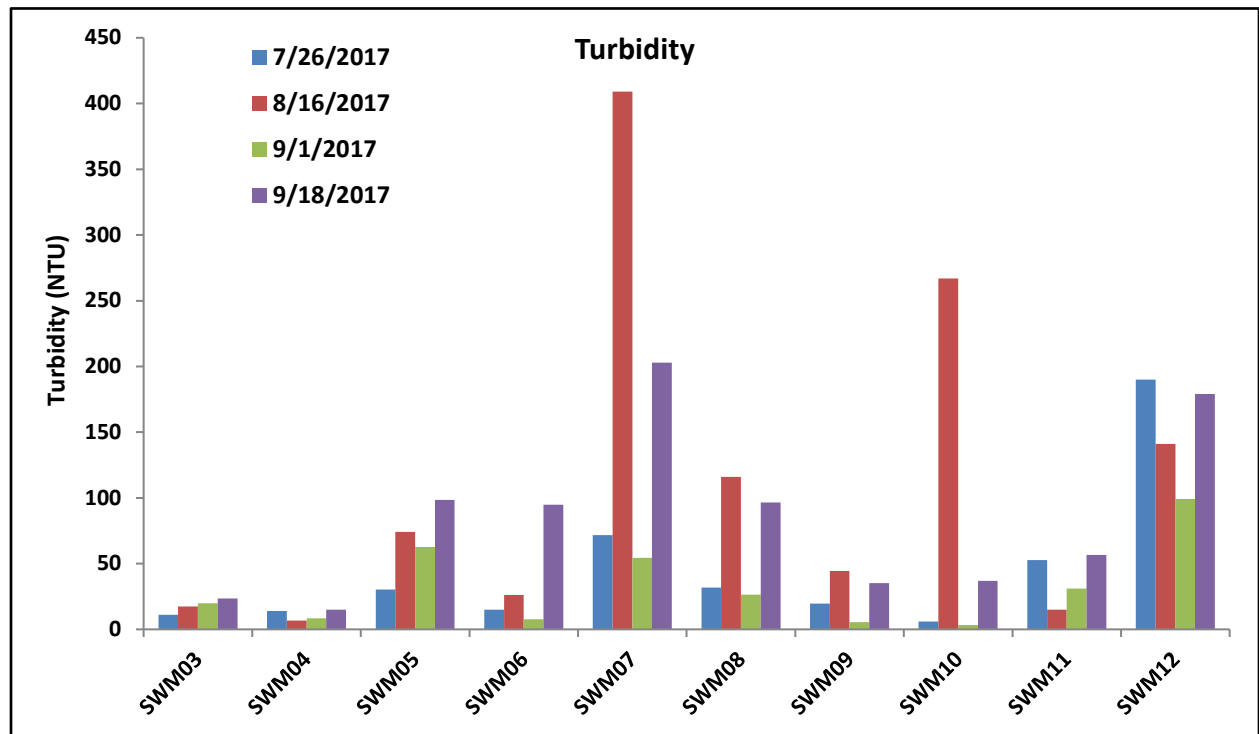


Figure 12. Turbidity Measured in Stormwater Sampled at Monitoring Sites During all Four Events.

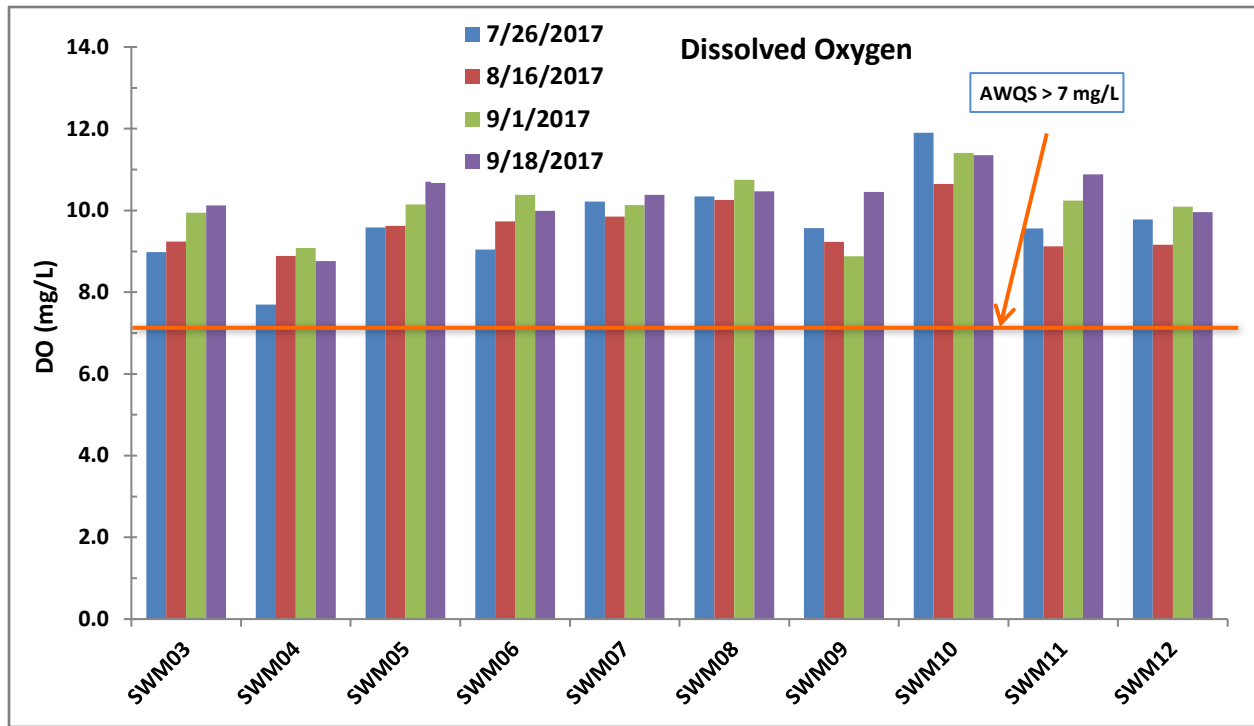


Figure 13. Dissolved Oxygen Measured in Stormwater Sampled at Monitoring Sites During all Four Events. (AWQS Criteria > 7 mg/L.)

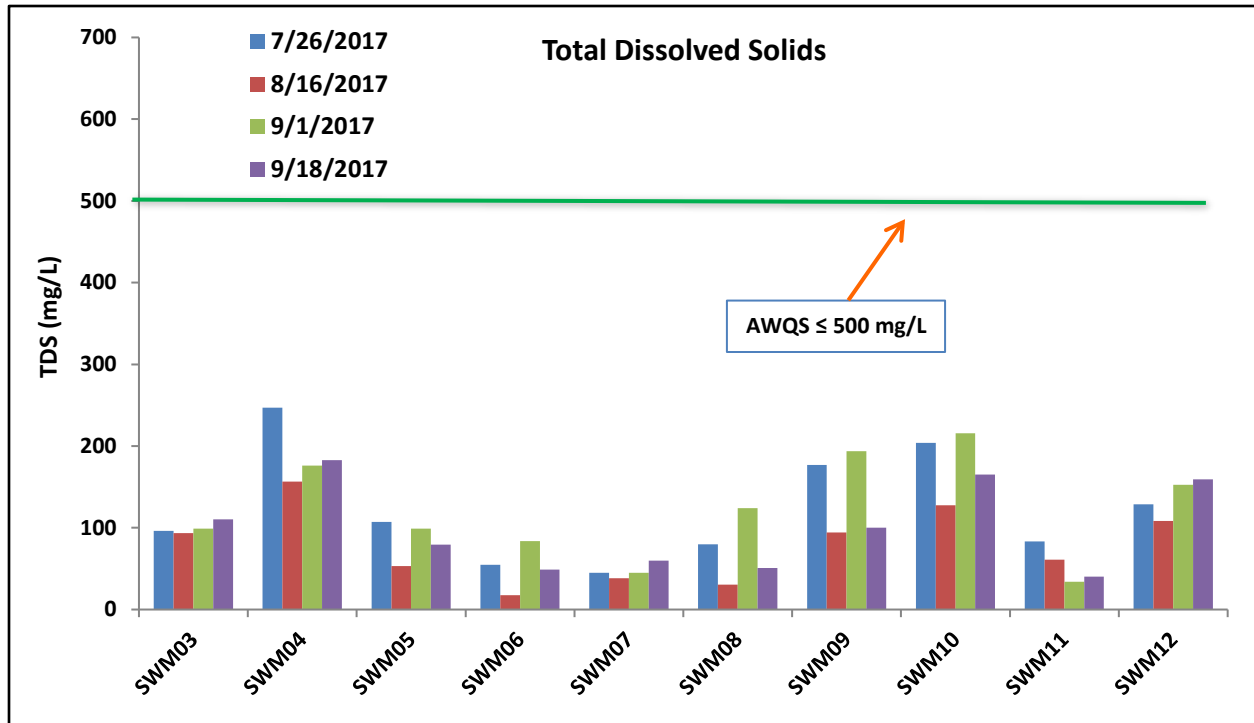
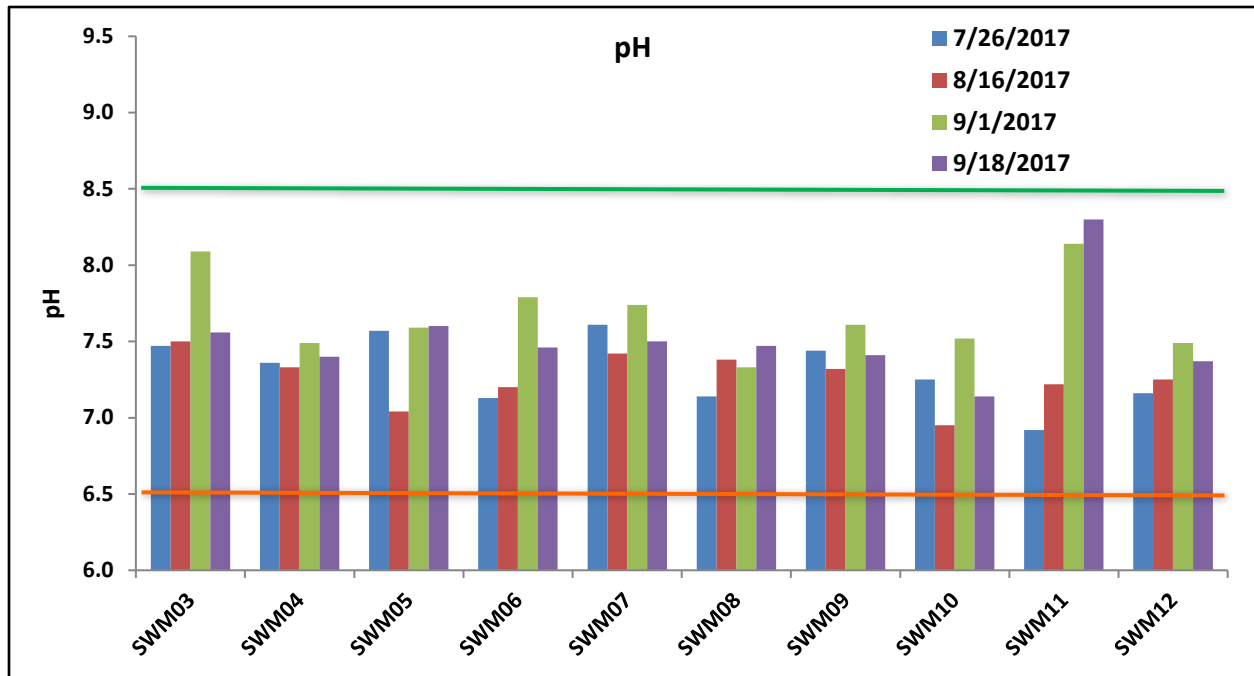
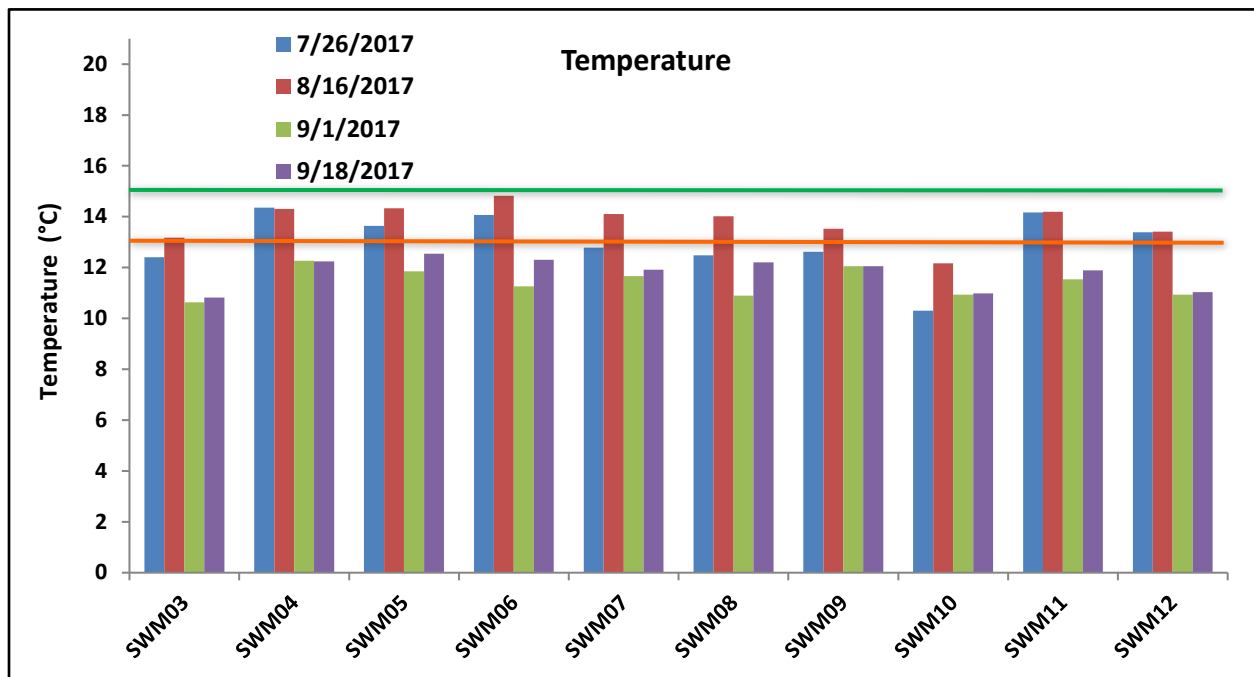


Figure 14. Total Dissolved Solids Measured in Stormwater Sampled at Monitoring Sites During all Four Events. (AWQS Criteria ≤ 500 mg/L.)



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

Figure 15. pH (units) Measured in Stormwater Sampled at Monitoring Sites During all Four Events. (AWQS Criteria ≥ 6.5 and ≤ 8.5).



Red line indicates the upper limit of 13°C for spawning and green line indicates the upper limit of 15°C for migration.

Figure 16. Temperature (°C) Measured in Stormwater Sampled at Monitoring Sites During all Four Events. (AWQS Criteria $\leq 13^\circ\text{C}$ for spawning and egg/fry incubation and $\leq 15^\circ\text{C}$ for migration routes and rearing areas).

Table 5. In Situ Parameters Measured at Monitoring Sites During All Four Sampling Events.

Station	Event 1 26-Jul-2017	Event 2 16-Aug-2017	Event 3 1-Sept-2017	Event 4 18-Sept-2017	Mean
<i>Flow Rate (gpm)</i>					
SWM03	48.5	124	146	97.1	104
SWM04	1.53	44.6	40.0	14.4	25.2
SWM05	2.22	47.6	5.43	183	59.6
SWM06	31.3	40.4	0.16	53.5	31.3
SWM07	1.87	121	44.7	16.7	46.1
SWM08	59.9	2259	64.6	877	815
SWM09	3.30	31.0	15.0	11.3	15.2
SWM10	63.6	238	32.2	173	127
SWM11	48.0	27.4	20.9	160	64.1
SWM12	84.7	141	61.6	319	152
<i>Turbidity (NTU)</i>					
SWM03	11.0	17.4	19.8	23.6	18.0
SWM04	13.9	6.59	8.39	14.9	10.9
SWM05	30.3	74.1	62.6	98.4	66.4
SWM06	15.0	26.2	7.60	94.9	35.9
SWM07	71.6	409	54.5	203	184.5
SWM08	31.8	116	26.4	96.6	67.7
SWM09	19.6	44.5	5.36	35.1	26.1
SWM10	6.02	267	3.35	36.9	78.3
SWM11	52.7	14.9	31.0	56.5	38.8
SWM12	190	141	99.1	179	152.3
<i>Dissolved Oxygen (mg/L)</i>					
SWM03	8.98	9.24	9.94	10.12	9.57
SWM04	7.70	8.89	9.08	8.76	8.61
SWM05	9.58	9.62	10.15	10.70	10.01
SWM06	9.04	9.73	10.38	9.99	9.79
SWM07	10.22	9.85	10.13	10.38	10.15
SWM08	10.34	10.26	10.75	10.47	10.46
SWM09	9.57	9.23	8.88	10.45	9.53
SWM10	11.90	10.65	11.41	11.35	11.33
SWM11	9.56	9.12	10.24	10.88	9.95
SWM12	9.78	9.16	10.09	9.96	9.75

Table 5. Continued.

Total Dissolved Solids (mg/L)					
SWM03	96.2	93.6	98.8	110.5	99.8
SWM04	247.0	156.7	176.2	182.7	190.6
SWM05	107.3	53.3	98.8	79.3	84.7
SWM06	54.6	17.6	83.9	48.8	51.2
SWM07	44.9	38.4	44.9	59.8	47.0
SWM08	80.0	30.6	124.2	50.7	71.3
SWM09	176.8	94.3	193.7	100.1	141.2
SWM10	204.1	127.4	215.8	165.1	178.1
SWM11	83.2	61.1	33.8	40.3	54.6
SWM12	128.7	108.6	152.8	159.3	137.3
pH					
SWM03	7.47	7.50	8.09	7.56	7.47 – 8.09
SWM04	7.36	7.33	7.49	7.40	7.33 – 7.49
SWM05	7.57	7.04	7.59	7.60	7.04 – 7.60
SWM06	7.13	7.20	7.79	7.46	7.13 – 7.79
SWM07	7.61	7.42	7.74	7.50	7.42 – 7.74
SWM08	7.14	7.38	7.33	7.47	7.14 – 7.47
SWM09	7.44	7.32	7.61	7.41	7.32 – 7.61
SWM10	7.25	6.95	7.52	7.14	6.95 – 7.52
SWM11	6.92	7.22	8.14	8.30	6.92 – 8.30
SWM12	7.16	7.25	7.49	7.37	7.16 – 7.49
Temperature (°C)					
SWM03	12.41	13.17	10.63	10.82	11.76
SWM04	14.36	14.31	12.27	12.24	13.30
SWM05	13.64	14.33	11.85	12.55	13.09
SWM06	14.07	14.82	11.26	12.31	13.12
SWM07	12.79	14.11	11.66	11.92	12.62
SWM08	12.48	14.02	10.90	12.21	12.40
SWM09	12.62	13.53	12.05	12.06	12.57
SWM10	10.30	12.17	10.93	10.98	11.10
SWM11	14.17	14.20	11.54	11.89	12.95
SWM12	13.39	13.41	10.93	11.03	12.19

Dissolved oxygen (DO) levels were generally fairly high and near saturation. The highest concentrations at eight locations were seen during the third storm event. Many of the outfalls had fairly turbulent flows which tend to raise DO levels. Mean DO concentrations ranged from 8.61 to 11.33 mg/L (Table 5). The lowest DO level for any of the surveys was seen at SWM04, with a concentration of 7.70 mg/L measured during the first storm event. This level is still above the minimum AWQS criteria of 7.0 mg/L for the growth and propagation of fish, shellfish, and other aquatic life and wildlife (Figure 13).

Although not required by the monitoring plan, specific conductivity was recorded at each site since it was available on the portable multi-parameter field instrumentation and is considered useful for interpretation of the stormwater data. Specific conductance was then converted to total dissolved solid (TDS) concentrations so that comparisons could be made with AWQS criteria. Water from SWM04 and SWM10 tended to have notably higher TDS levels than the other locations. Mean TDS concentrations ranged from 47.0 milligrams/liter (mg/L) at SWM07 to 190.6 mg/L at SWM02 (Table 5). Although elevated conductivity and TDS can be indicative of contaminants, the highest concentrations measured were well within expected ranges for stormwater (EPA 1983). Also, no TDS concentrations were found that exceeded the most restrictive AWQS criteria of 500 mg/L (Figure 14).

Measurements of pH were all within AWQS criteria for all storm events and locations (Table 5 and Figure 15). pH across all stations ranged from a low of 6.92 pH units to a high of 8.30, both of which occurred at SWM11. Rainfall is often slightly acidic, but exposure to minerals in soils typically mitigates any brief depressions. The National Atmospheric Deposition Program (NADP) indicates that rainfall in Alaska is typically in the range of 5.2 to 5.5 pH units.

In 2017, eight of the ten locations were coolest during the third storm (Table 5). The coolest outfall discharge temperatures were seen at SWM10 for two of the four storm events with a mean temperature of 11.10°C, and the warmest temperatures were seen at SWM04, which drains a small residential area, with a mean temperature of 13.30°C. The majority of temperature values were found to be less than the AWQS of 13°C for spawning and egg/fry incubation areas, and all were below the AWQS criteria of 15°C for migration routes and rearing areas (Figure 16).

In addition to the standard field measurements, the field crew also recorded visual observations of any odor, water color, clarity, floatables, deposits or stains, sheens, and debris. Observations for petroleum odor and sheen are noted under hydrocarbons. A hydrocarbon odor was noticed at SWM08 during three of the four sampling efforts; this station receives runoff from a large mixed-use area. A slight hydrocarbon odor was also observed at SWM09 during the first event and at SWM06 during the fourth storm event. An oily sheen was observed at SWM05 during the third storm event. Observations of water color and clarity were consistent and matched those outfalls where high turbidity and TSS were observed. Floatables consisted of some suds, vegetative material, and other small pieces of organic material that were noted at a few locations (refer to field logs in Appendix D). 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 area streams. Other observations included a small amount of scum at several sites, some garbage-type debris, sediment deposits, and algae. Other than hydrocarbons and turbidity, no attempt has been made to correlate any of the visual observations with the conventional or pollutant measurements.

4.3 Conventional Parameters (BOD₅ and TSS)

The BOD₅ concentrations during 2017 were found to be fairly low at all locations for all four storm events with no clear seasonal pattern (Table 6 and Figure 17). Concentrations ranged from a low of not detected (ND) (<2 mg/L) at many sites to a high of 12.3 mg/L measured at SWM12 during the fourth storm event. The highest overall BOD₅ concentrations were also seen at SWM12 with mean concentration of 7.65 mg/L. The next highest mean concentration was 7.2 mg/L which was seen at SWM07.

As noted earlier, it is expected that TSS levels would be highly correlated with turbidity. SWM12 had the highest mean TSS in 2017 at 71.1 mg/L and also exhibited second highest turbidity levels (Tables 5 and 6, Figures 12 and 18). TSS concentrations ranged from 1.70 mg/L at SWM10 during the third event to a high of 179 mg/L at SWM05 seen during the second storm event. The station mean concentrations ranged from 8.7 mg/L at SWM06 to 71.1 mg/L at SWM12. Large differences can occur for TSS since this parameter is highly dependent on the drainage area and is a function of the type of useage, percent impervious surfaces, slope, flow rate, and other factors.

4.4 Fecal Coliform

Fecal coliform measurements were found to often exceed the 200 fecal coliform (FC)/100 mL AWQS criteria. Overall, concentrations were found to be similar when compared to those seen in prior years (Table 6 and Figure 19). The highest concentrations seen in 2017 occurred at the two new stations, SWM11 and SWM12 with geometric mean concentrations of 4,736 and 6,065 FC/100 mL, respectively. Although the AWQS do not directly apply to stormwater, the limit of 200 FC/100 mL was used as a benchmark comparison since most applicable beneficial use criteria are based on this numeric limit (refer to Table 9). The site with the lowest geometric mean was SWM04 with a concentration of 197 FC/100 mL. Other sites with low geometric mean fecal coliform levels were SWM06 and SWM10. Overall, only five individual samples from 2017 were less than the 200 FC/100 mL criteria. Studies conducted by EPA in the early 1980s (EPA, 1983) indicated that fecal coliform levels in warm climates were typically in the range of 10s to 100s of thousand FC/100 ml with a median of 21,000 FC/100 mL. In colder climates, the median concentration of fecal coliform was in the range of 1,000 FC/100 mL which is similar to concentrations seen at most locations and storms during 2017.

Despite the fact that established fecal coliform standards were exceeded during most storms at all ten sites, overall mean concentrations were not alarming when compared to typical concentrations seen in urban areas (EPA 1983). The highest mean concentrations were seen at SWM07, SWM08, SWM09, SWM11, and SWM12 with geometric means of 3036, 2755, 2347, 4736, and 6065 FC/100 mL, respectively, although elevated individual samples were also seen at a number of other locations (Table 6). An earlier analysis of fecal coliform in Anchorage streams indicated that highest loads would most likely occur in August/September in association with peak runoff and rainfall (MOA 2003). This analysis appeared to agree with what was seen during both 2011 and 2013 when the highest levels of fecal coliform tended to occur in July and August with somewhat lower levels seen in September. However, in 2017, the highest levels at each site were spread across all four storms. The high variability of fecal coliform measurements

Table 6. Concentrations of Microbiological and Conventional Parameters.

Station	Event 1 26-Jul-2017	Event 2 16-Aug-2017	Event 3 1-Sept-2017	Event 4 18-Sept-2017	Mean
Biological Oxygen Demand (mg/L)					
SWM03	2.19	2U	2.01	4.53	2.43
SWM04	4.81	2U	2U	3.32	2.53
SWM05	3.34	2.05	2U	5.46	2.96
SWM06	2U	2U	2U	10.7	3.43
SWM07	4.05	8.94	4.12	11.7	7.20
SWM08	3.46	4.97	2U	7.86	4.32
SWM09	2U	2.98	2U	4.79	2.44
SWM10	2U	2.09	2U	3.66	1.94
SWM11	7.20	2.18	2.58	7.65	4.90
SWM12	7.35	4.98	5.98	12.3	7.65
Total Suspended Solids (mg/L)					
SWM03	6.34	9.68	13.9	6.80	9.2
SWM04	13.8	4.62	71.1	6.80	24.1
SWM05	12.4	33.0	25.4	56.3	31.8
SWM06	6.70	15.3	5.39	7.50	8.7
SWM07	23.8	179	12.3	37.3	63.1
SWM08	11.0	96.5	11.6	38.7	39.5
SWM09	6.73	26.5	23.4	21.5	19.5
SWM10	2.78	137	1.70	14.2	38.9
SWM11	22.7	9.90	15.1	35.3	20.8
SWM12	93.5	65.0	51.5	74.4	71.1
Fecal Coliform (FC/100 mL)					
SWM03	2600	845	1720	1200	1459
SWM04	102	482	530	58	197
SWM05	10200	864	550	2500	1866
SWM06	390	500	784	144	385
SWM07	1760	10000	2100	2300	3036
SWM08	1060	11600	901	5200	2755
SWM09	2100	20000	42	17200	2347
SWM10	64	793	380	520	316
SWM11	1430	7820	36000	1250	4736
SWM12	8100	5100	2800	11700	6065

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

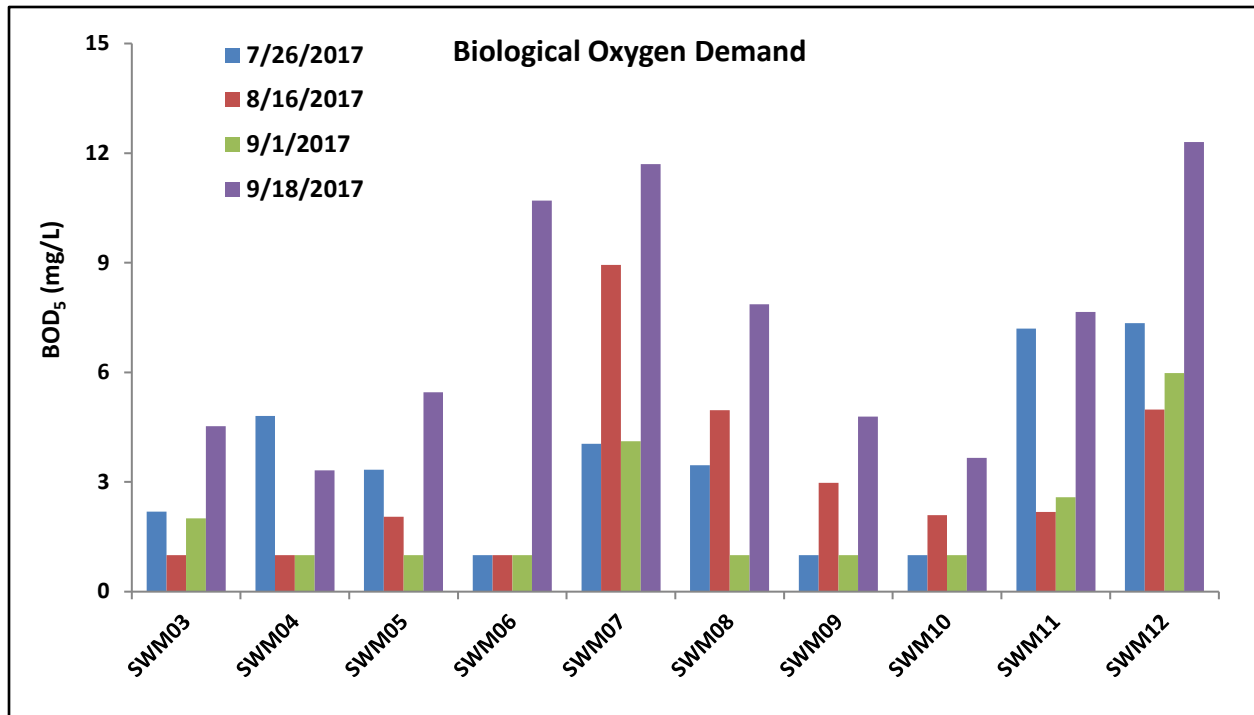


Figure 17. BOD₅ (mg/L) Measured in Stormwater Sampled at Monitoring Sites During all Four Events. (Note: ND ≤ 1 mg/L.)

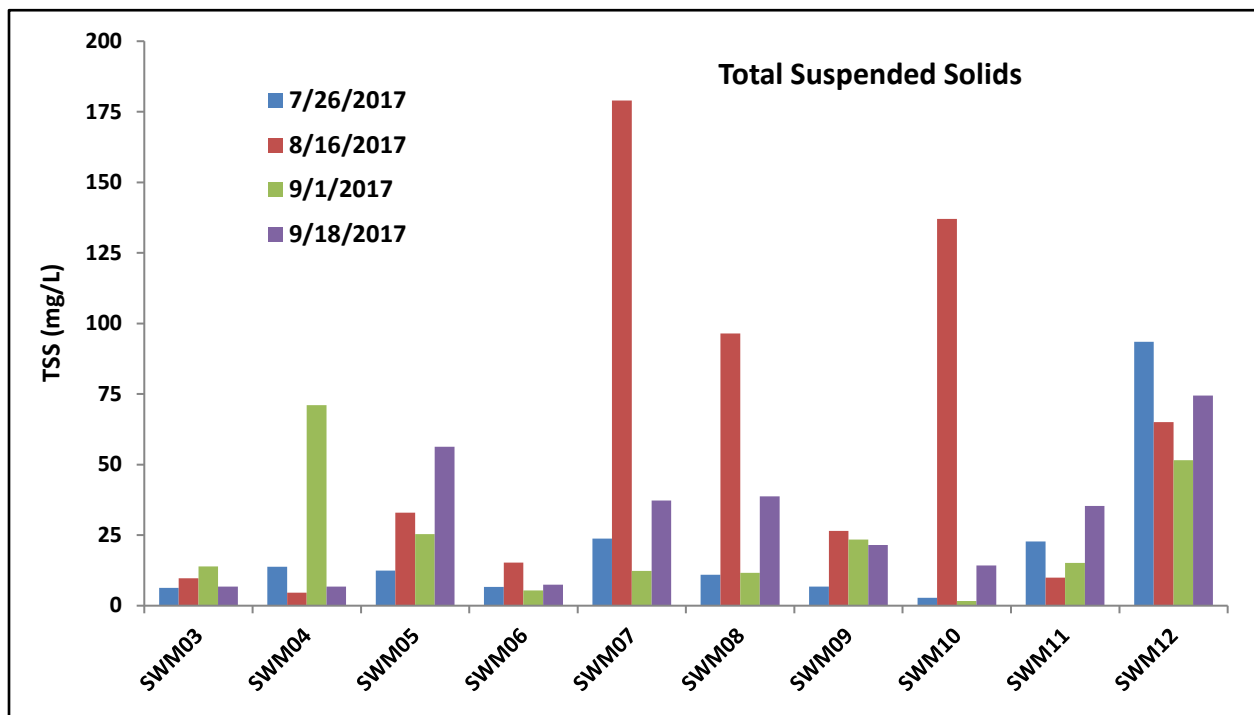


Figure 18. Total Suspended Solids Measured in Stormwater Sampled at Monitoring Sites During all Four Events.

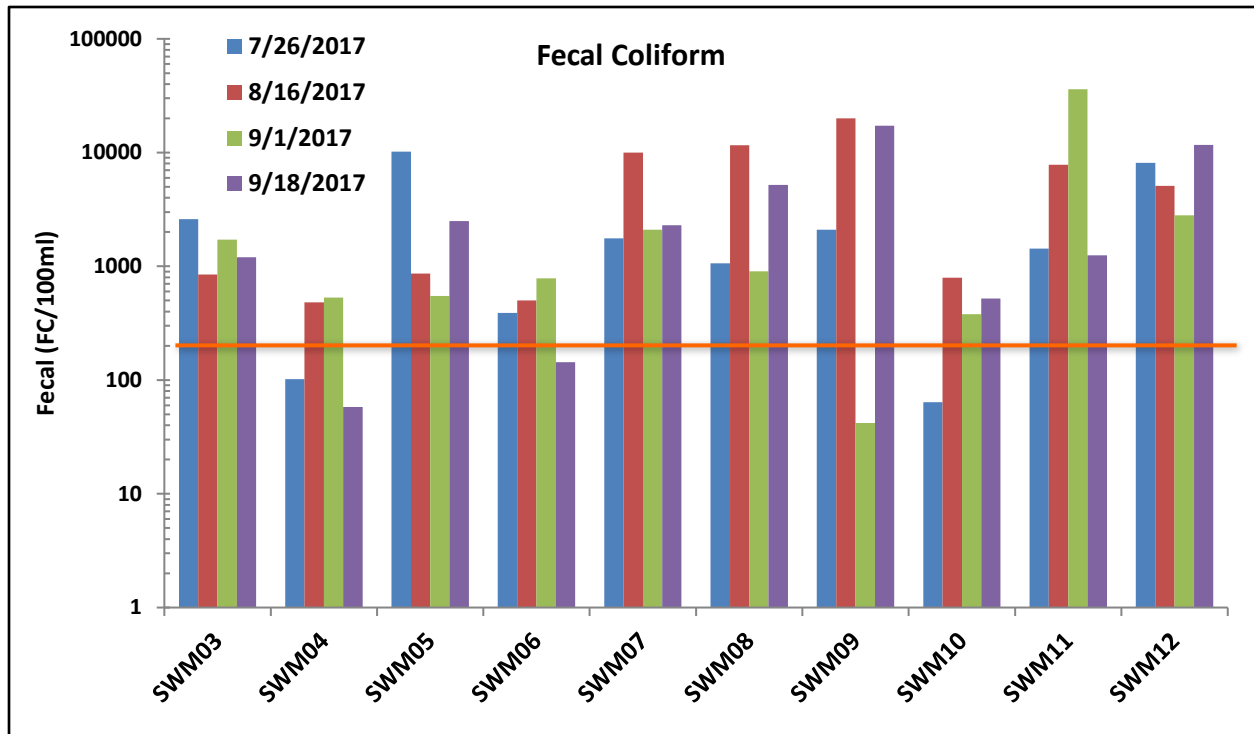


Figure 19. Fecal Coliform (FC/100 mL) Measured in Stormwater Sampled at Monitoring Sites during all Four Events. (AWQS \leq 200 FC/100 mL.)

between storm events and locations suggests the need to continue monitoring this parameter over a relatively extended time period to better assess performance of control measures.

In addition to the four storm events, five supplemental fecal coliform samples were obtained at SWM07 on 4 October 2017 during a storm event. Samples were taken at 15-minute intervals over a one-hour period. Results from this sampling effort were the following; 200, 1000, 1270, 2200, and 2600 FC/100 mL indicating a high degree of within-storm variability within the stormwater waste stream. Overall, concentrations were lower than those seen during the regular sampling program.

4.5 Metals and Hardness

Supplemental monitoring of dissolved copper and total water hardness were added in 2016 for all locations and storms. The Permit requirements and monitoring conducted in prior years did not include these two parameters.

Hardness was found to be highly variable between locations and events. Hardness concentrations ranged from a low of 11.0 mg/L to a high of 121 mg/L (Table 7 and Figure 20). Mean concentrations ranged from a low of 28.4 mg/L at SWM07 to a high of 96.7 mg/L at SWM04. Typically, within the same water body, hardness is inversely correlated to turbidity and TSS. This relationship is not clear in the 2017 data, where five of the ten sites had their highest hardness values during the first storm, but of these, only two stations (SWM05 and SWM09) had corresponding minimum TSS levels during that same storm. Hardness is an important parameter

for freshwater since it affects toxicity and it is used to determine both the acute and chronic receiving water criteria for many metals. As hardness increases, so does the corresponding metals criteria. For example, for the State of Alaska, the acute water quality criteria for copper range from a concentration of 6.99 µg/L at a hardness of 50 mg/L to a concentration of 13.44 µg/L at a hardness value of 100 mg/L. However, in order to apply this information directly to the metals data collected in this program, hardness data is needed for the receiving waterbody.

Dissolved copper concentrations were quite variable and ranged from ND (<1 µg/L) to a high of 17.6 µg/L that was seen at SWM07 during the fourth storm (Table 7 and Figure 21). Concentrations at this site were also elevated during two of the other three storms when compared to acute criteria level. Mean copper concentrations ranged from 1.2 µg/L at SWM10 to a high of 10.6 µg/L seen at SWM07. The next highest copper concentrations were seen at SWM05 with a mean of 8.4 µg/L. These two outfalls also exhibited some of the highest dissolved copper concentrations during 2016.

Table 7. Concentrations of Hardness and Dissolved Copper.

Station	Event 1 26-Jul-2017	Event 2 16-Aug-2017	Event 3 1-Sept-2017	Event 4 18-Sept-2017	Mean
Hardness (mg/L)					
SWM03	64.9	62.8	58.4	70.4	64.1
SWM04	121.0	89.6	86.1	89.9	96.7
SWM05	60.1	34.0	60.1	44.5	49.7
SWM06	30.4	11.0	46.3	27.0	28.7
SWM07	19.6	36.1	22.6	35.3	28.4
SWM08	38.0	21.4	54.8	26.0	35.1
SWM09	106.0	64.2	97.5	59.4	81.8
SWM10	100.0	73.5	97.1	78.3	87.2
SWM11	39.0	37.4	20.3	25.5	30.6
SWM12	62.9	73.8	83.6	94.9	78.8
Dissolved Copper (µg/L)					
SWM03	3.8	2.7	2.1	4.9	3.3
SWM04	3.5	2.6	2.3	3.5	3.0
SWM05	12.1	8.2	4.5	8.6	8.4
SWM06	2.8	2.4	2.8	5.5	3.4
SWM07	8.4	10.6	6.0	17.6	10.6
SWM08	4.5	4.6	2.6	9.1	5.2
SWM09	1.9	3.1	1U	4.0	2.4
SWM10	1U	1.4	1U	2.6	1.2
SWM11	8.5	3.2	2.7	6.6	5.3
SWM12	7.9	6.5	5.3	3.7	5.8

Footnotes: U = not detected at the associated reporting limit that is shown. Mean calculations utilized 1/2 the reporting limit where analyte was not detected.

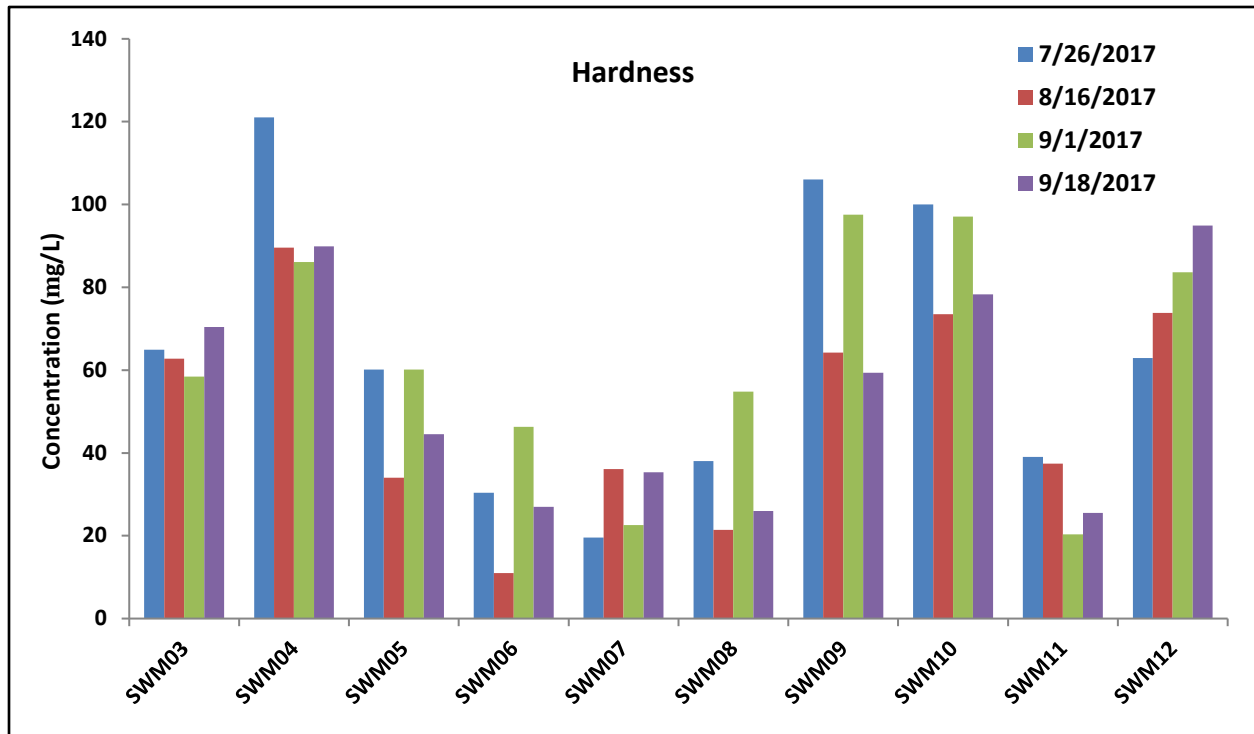


Figure 20. Water Hardness (mg/L) Measured in Stormwater Samples.

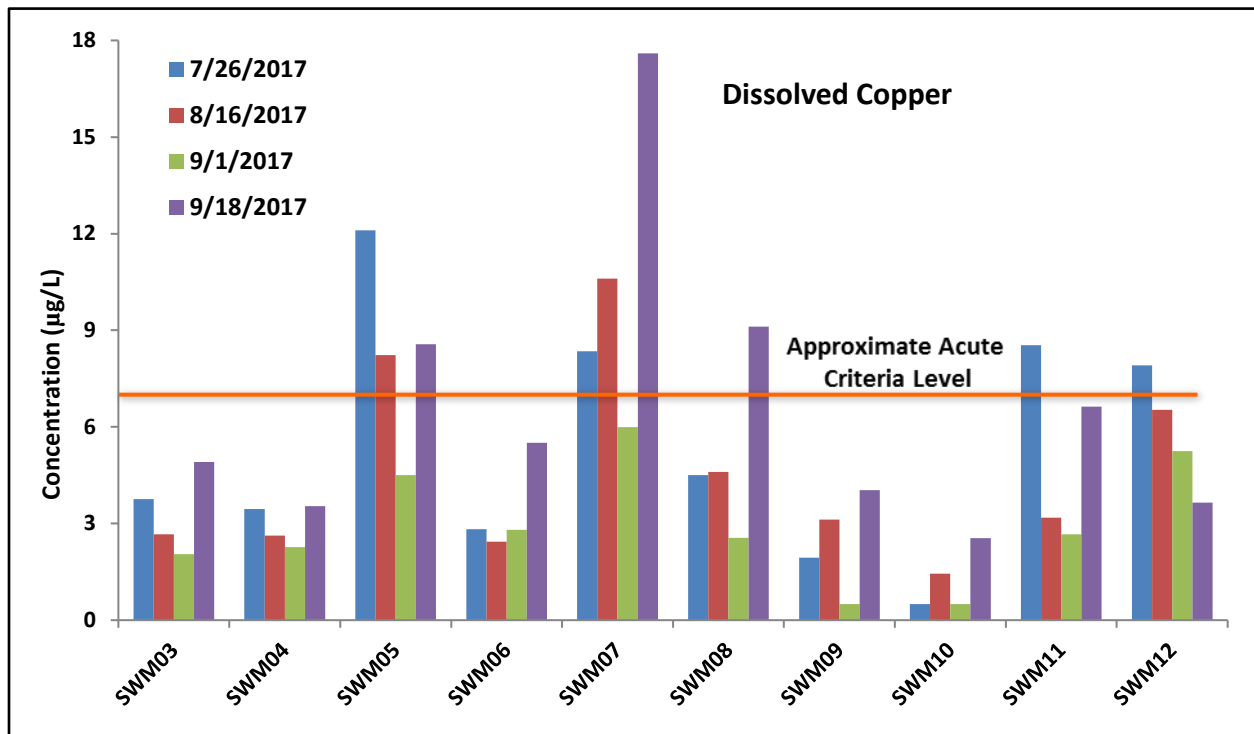


Figure 21. Dissolved Copper (µg/L) Measured in Stormwater Samples. (Acute AWQS based on hardness value of 50 mg/L in the receiving water.)

4.6 Hydrocarbons

Polycyclic aromatic hydrocarbons (PAHs) and total volatile aromatic hydrocarbons (TAH) were measured at four of the monitoring sites: SWM05, SWM07, SWM09, and SWM12. In all cases, total PAH (TPAH) concentrations were low ranging from 0.0144 to 2.863 $\mu\text{g/L}$ (Figure 22 and Table 8). TAH concentrations were all below detection limits for all sites and all storms except for a single detection of toluene at SWM05 during the fourth storm event at a concentration of 1.53 $\mu\text{g/L}$. All samples were well within the AWQS criteria for both the summed parameter of total aqueous hydrocarbons (TAqH) and TAH measured as benzene, ethylbenzene, toluene, and xylenes (BETX). TAqH is defined in the AWQS as the summation of TPAH and TAH with a criteria of 15 $\mu\text{g/L}$, whereas TAH alone has an AWQS criteria of 10 $\mu\text{g/L}$ (Table 9). The highest concentration of TAqH was 2.863 $\mu\text{g/L}$ at SWM09 during the third stormwater sampling event.

PAHs were the most common compounds found at each site and were typically comprised of combustion-related compounds like pyrene, fluoranthene, chrysene, benzo(a)pyrene, benzo(a)anthracene, benzo(g,h,i)perylene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene although low levels of dibenzo(a,h)anthracene and phenanthrene were also seen in one sample at SWM09. Concentrations of individual PAHs were found to be low and with the exception of six analytes in one sample at SWM09, were all less than 0.2 $\mu\text{g/L}$. Some PAHs were seen at all four sites during all four storm events. The highest PAH concentrations at two of the four sites occurred during the second storm event which was also generally the largest storm in terms of

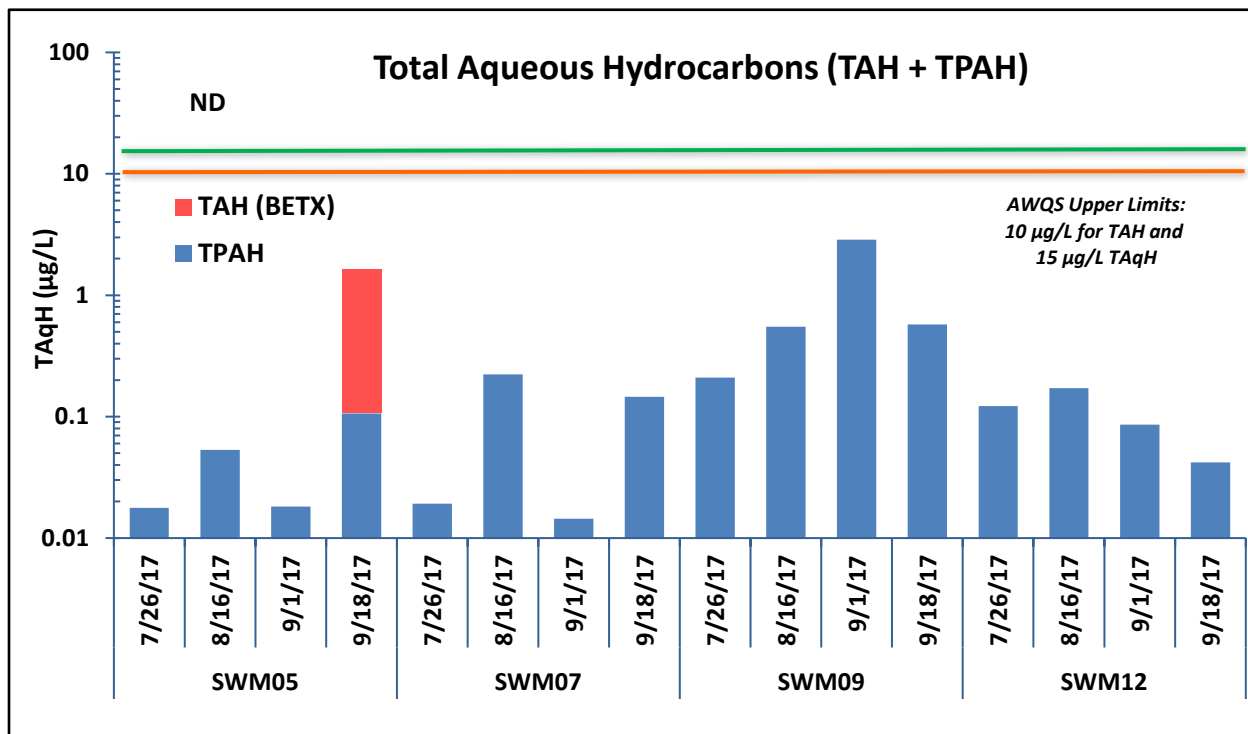


Figure 22. Total Aqueous Hydrocarbons (TAqH = TAH + TPAH) Measured in Stormwater Sampled at Monitoring Sites During all Four Events. (AWQS $\leq 10 \mu\text{g/L}$ for TAH and $\leq 15 \mu\text{g/L}$ for TAqH.)

Table 8. 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)			
	7/26/17	8/16/17	9/1/17	9/18/17	7/26/17	8/16/17	9/1/17	9/18/17	7/26/17	8/16/17	9/1/17	9/18/17	7/26/17	8/16/17	9/1/17	9/18/17
Polycyclic Aromatic Hydrocarbons (µg/L)																
Acenaphthene	0.013U	0.014U	0.013U	0.013U	0.013U	0.066U	0.013U	0.013U	0.013U	0.013U	0.014U	0.0162U	0.013U	0.014U	0.014U	0.013U
Acenaphthylene	0.013U	0.014U	0.013U	0.013U	0.013U	0.066U	0.013U	0.013U	0.013U	0.013U	0.014U	0.0162U	0.013U	0.014U	0.014U	0.013U
Anthracene	0.013U	0.014U	0.013U	0.013U	0.013U	0.0661	0.013U	0.013U	0.013U	0.013U	0.0233	0.0162U	0.013U	0.014U	0.014U	0.013U
Benzo(a)anthracene	0.013UJ-	0.014UJ-	0.013UJ-	0.013UJ-	0.013UJ-	0.066UJ-	0.013UJ-	0.013UJ-	0.013UJ-	0.0328J-	0.197J-	0.0469J-	0.013UJ-	0.014UJ-	0.014UJ-	0.013UJ-
Benzo(a)pyrene	0.0052UJ-	0.0055UJ-	0.0050UJ-	0.0050UJ-	0.0050UJ-	0.026UJ-	0.0051UJ-	0.0052UJ-	0.00831J-	0.0374J-	0.260J-	0.0065UJ-	0.0051UJ-	0.0057UJ-	0.00726J-	0.0053UJ-
Benzo(b)fluoranthene	0.013UJ-	0.014UJ-	0.013UJ-	0.013UJ-	0.013UJ-	0.066UJ-	0.013UJ-	0.013UJ-	0.0234J-	0.0782J-	0.407J-	0.0878J-	0.0162J-	0.0142UJ-	0.0231J-	0.013UJ-
Benzo(g,h,i)perylene	0.013UJ-	0.014UJ-	0.013UJ-	0.0208J-	0.013UJ-	0.066UJ-	0.013UJ-	0.0314J-	0.013UJ-	0.0448J-	0.239J-	0.0536J-	0.0167J-	0.0206J-	0.0192J-	0.0157J-
Benzo(k)fluoranthene	0.013UJ-	0.014UJ-	0.013UJ-	0.013UJ-	0.013UJ-	0.066UJ-	0.013UJ-	0.013UJ-	0.013UJ-	0.0261J-	0.126J-	0.0281J-	0.013UJ-	0.014UJ-	0.014UJ-	0.013UJ-
Chrysene	0.013UJ-	0.0247J-	0.013UJ-	0.0388J-	0.013UJ-	0.11J-	0.013UJ-	0.0387J-	0.0356J-	0.0752J-	0.295J-	0.0824J-	0.013UJ-	0.0364J-	0.014UJ-	0.0264J-
Dibenzo(a,h)anthracene	0.0052UJ-	0.0055UJ-	0.0050UJ-	0.0050UJ-	0.0050UJ-	0.026UJ-	0.0051UJ-	0.0052UJ-	0.0051UJ-	0.0052UJ-	0.0468J-	0.0065UJ-	0.0051UJ-	0.0057UJ-	0.0054UJ-	0.0053UJ-
Fluoranthene	0.0178	0.0286	0.0182	0.0464	0.0192	0.113	0.0144	0.013U	0.0878	0.127	0.509	0.127	0.0371J-	0.0503J-	0.0364J-	0.013UJ-
Fluorene	0.013U	0.014U	0.013U	0.013U	0.013U	0.066U	0.013U	0.013U	0.013U	0.013U	0.014U	0.016U	0.013U	0.014U	0.014U	0.013U
Indeno(1,2,3-cd)pyrene	0.013UJ-	0.014UJ-	0.013UJ-	0.013UJ-	0.013UJ-	0.066UJ-	0.013UJ-	0.013UJ-	0.013UJ-	0.0351J-	0.186J-	0.0425J-	0.013UJ-	0.014UJ-	0.014UJ-	0.013UJ-
Naphthalene	0.026U	0.028U	0.026U	0.025U	0.025U	0.132U	0.026U	0.026U	0.026U	0.026U	0.028U	0.032U	0.026U	0.028U	0.027U	0.026U
Phenanthrene	0.052U	0.055U	0.051U	0.050U	0.050U	0.265U	0.051U	0.052U	0.051U	0.052U	0.168	0.065U	0.051U	0.057U	0.054U	0.053U
Pyrene	0.052U	0.055U	0.051U	0.050U	0.050U	0.265U	0.051U	0.0753	0.0542	0.0939	0.406	0.105	0.0521	0.0645	0.054U	0.053U
Volatile Aromatic Hydrocarbons (µg/L)																
1,2-Dichlorobenzene	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
1,3-Dichlorobenzene	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
1,4-Dichlorobenzene	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
Benzene	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U	0.4U
Chlorobenzene	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
Ethylbenzene	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
o-Xylene	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
Toluene	1U	1U	1U	1.53	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U
Xylene, Isomers m & p	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U	2U
Hydrocarbon Summary Parameters (µg/L)																
TPAH	0.0178	0.0533	0.0182	0.106	0.0192	0.223	0.0144	0.1454	0.2093	0.551	2.863	0.573	0.1221	0.1718	0.0860	0.0421
TAH as BETX	ND	ND	ND	1.53	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TAqH (TPAH + TAH)	0.0178	0.0533	0.0182	1.636	0.0192	0.223	0.0144	0.1454	0.2093	0.5505	2.863	0.573	0.1221	0.1718	0.0860	0.0421

Footnotes: U = not detected at the reporting limit. ND = no concentration detected in any analyte tested. J- = Estimated value biased low due to matrix interferences.
 All detected concentrations are shown in bold. Hydrocarbon summary parameters only include detected concentrations.

Table 9. Pertinent Numeric Alaska Water Quality Standard 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% 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 7 mg/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.
(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 the 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 9. Continued

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)						

Source: Alaska Department of Environmental Conservation, 18AAC70 Water Quality Standards, Amended as of February 5, 2017.

outfall flow rates and TSS/turbidity levels at most sites. There did not appear to be any noticeable differences in PAH levels at the two sites with OGS versus the two that did not.

In addition to the laboratory measurements of PAH and TAH, field observations were recorded of any sheens or odors. A sheen was observed at SWM05 during the third event. Although not sampled for hydrocarbons, a hydrocarbon odor was also noted at SWM08 during three of the four sampling events and at SWM09 during one sampling event.

4.7 Site Trends

This report presents the latest of seven years of monitoring for the program. Some general trends between sites were detected that in some cases have persisted across sampling events and between years. General site differences were investigated graphically with boxplots that have been prepared for each field and laboratory parameter (Figures 23, 24, and 25). With the exception of the two new outfalls (SWM11 and SWM12), the boxplots constitute the results from 26–28 samples collected at each location during 2011 through 2017 and depict the minimum, maximum, median, 25th-percentile, 75th-percentile, and grand median measurements across all locations. The boxplots

for SWM11 and SWM12 represent just four samples from 2017. In addition, AWQS criteria have been plotted where appropriate for each parameter.

A few locations seem to stand out for each parameter. Temperature is somewhat lower at two locations (SWM03 and SWM10). This may be a function of the duration in which the stormwater flows through a buried storm drain network versus the drainages with more open-channel and overland flow with shorter pipe networks. Water flowing through buried pipes tends to remain cooler than that flowing overland during the summer months.

DO was near saturation at all locations. SWM10 had the highest levels potentially due to turbulent flow in the outfall pipe prior to discharge. SWM10 was also one of the locations with the lowest BOD₅ concentration. This potential correlation did not hold true for SWM07 which had a median DO level of ~10 mg/L, slightly above average, but that also had the highest BOD₅ concentration. For BOD₅, SWM07 and SWM12 are somewhat higher which may be the result of vehicle cooling liquid inputs (glycols) from streets and driveways. The drainage areas for both of these outfalls include a high percentage of streets, parking lots, and other impervious surfaces.

For pH, SWM06 is consistently lower than the other locations with a few measurements below the AWQS lower limit of 6.5 pH units. Outfalls SWM03 and SWM11 had the highest median pH concentration. No outfalls or storm events exceeded the upper water quality criteria limit for pH of 8.5 pH units.

TDS appeared to be slightly higher at both SWM04 and SWM10 and may be an indication of other pollutants such as trace metals or salts. Potential sources could be magnesium chloride, which MOA uses on the city streets for de-icing/anti-icing purposes, or residential/commercial use of deicing salts on walkways and driveways, particularly during the early summer storms. Both of these outfalls drain primarily residential areas. USGS (2006) documented increases in TDS, sodium, and chloride levels in the downstream direction within the Chester Creek drainage that indicate influences from urbanization.

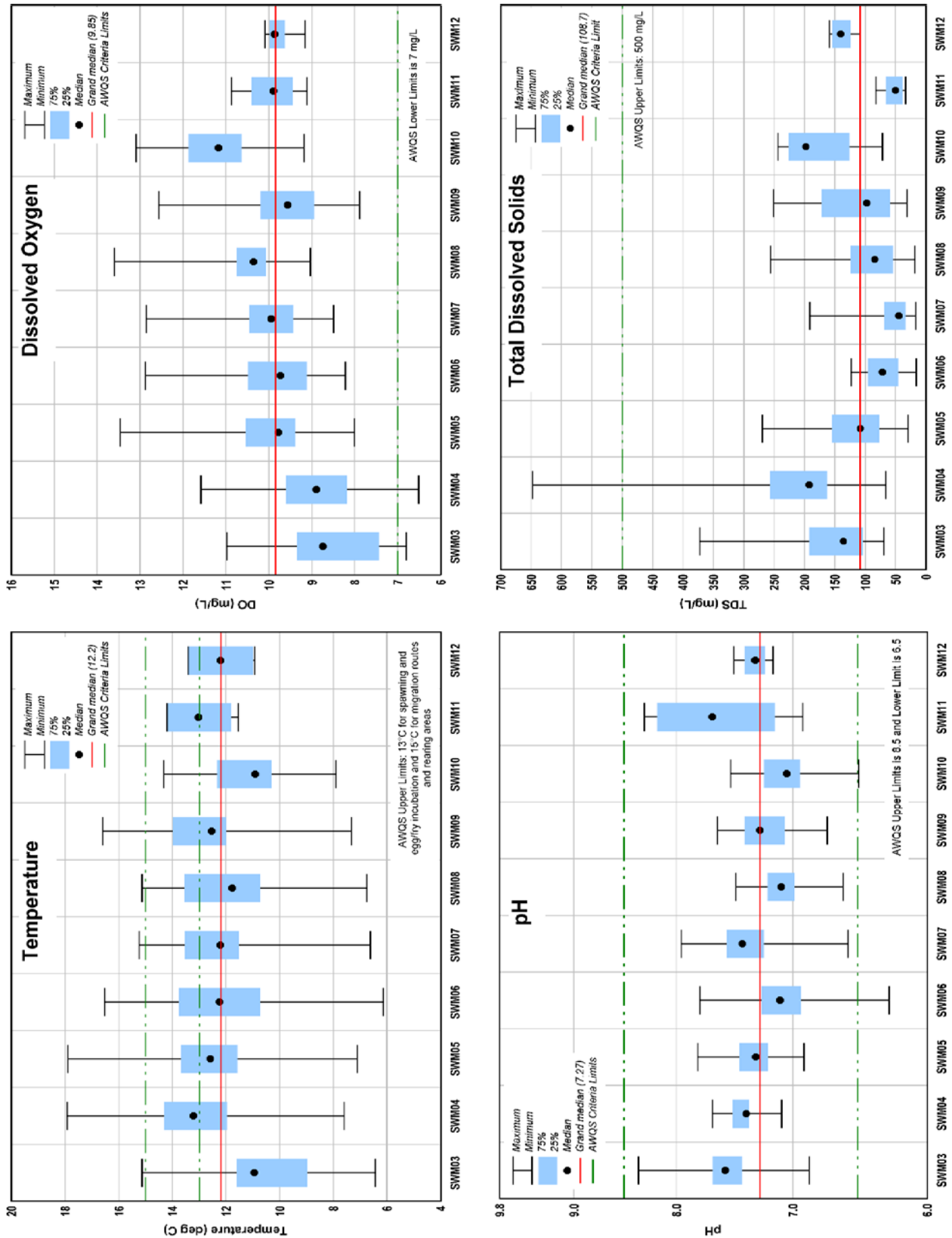


Figure 23. Station Boxplots of pH, Temperature, Total Dissolved Solids, and Dissolved Oxygen for 2011 through 2017.

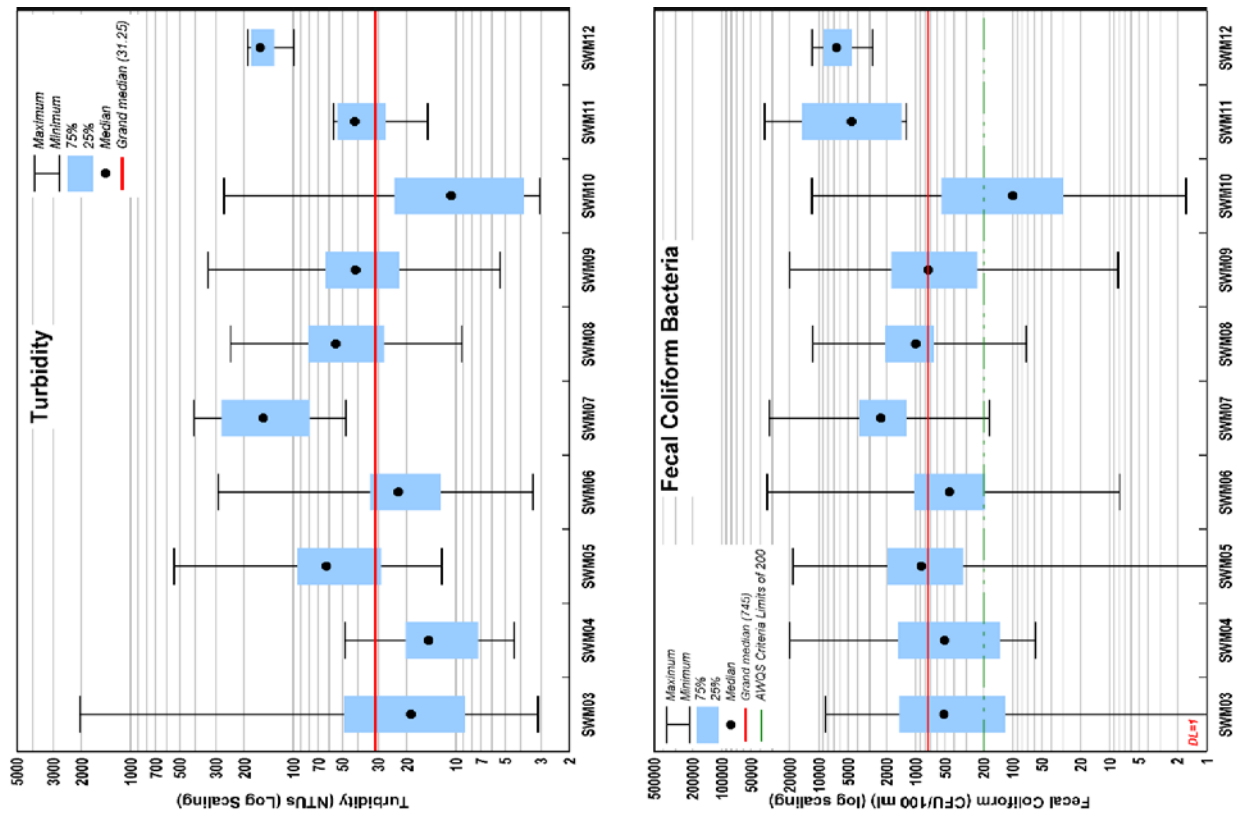
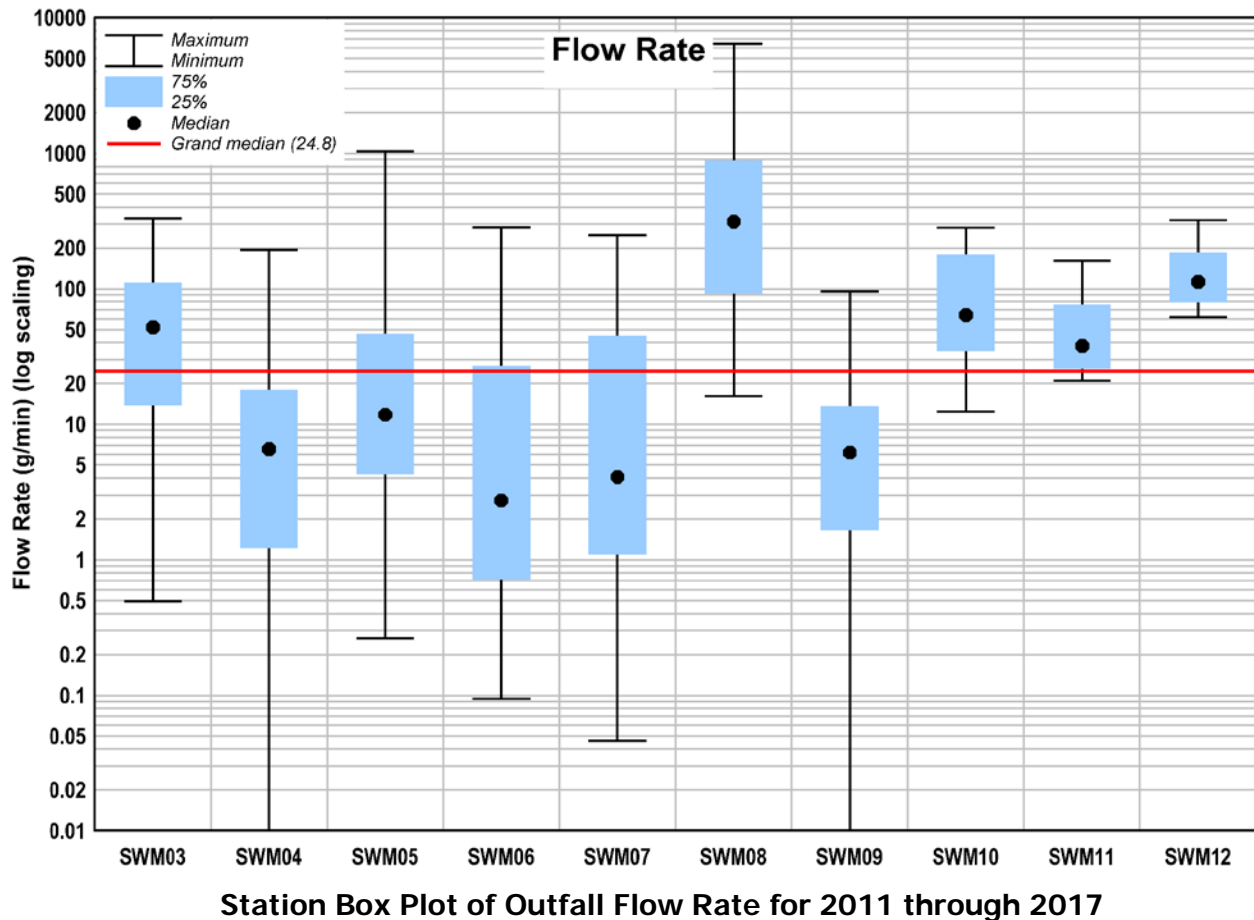


Figure 24. Station Boxplots of Total Suspended Solids, Turbidity, Biological Oxygen Demand, and Fecal Coliform for 2011 through 2017.



Both TSS and turbidity were highly variable although there was a general positive correlation between TSS and turbidity in the boxplot location patterns. The highest median TSS and turbidity concentrations were detected at SWM07 and at the newly-sampled outfall SWM12. Outfall SWM07 has been consistently high for each year of the study.

For fecal coliform, SWM10 was consistently lower than other locations, and SWM07 has been consistently much higher historically. Fecal coliform concentrations were also found to be high at the two new outfall locations, SWM11 and SWM12, although the box plot only represents four samples from each new location. Other elevated locations included SWM05 and SWM08. The sources of the higher concentrations seen at SWM07, SWM11, and SWM12 are unknown, but these observations will be used to guide future efforts and to focus subsequent analyses.

Flow rate was highly variable between locations and between events. Outfall SWM08, which is a large 42-inch pipe that drains the largest basin, had consistently higher flow rates than the other locations. The lowest flow was at SWM06 which drains a small residential area. Flows at SWM03, SWM10, SWM11, and SWM12 were also relatively high when compared to the other five locations, although some of the other locations exhibited high flows during some storm events. For some outfalls, particularly for those with small drainage basins, flow rates responded rapidly to changes in precipitation.

4.8 Yearly and Seasonal Trends

The data were examined for any yearly or seasonal trends to determine if differences in the concentration of any parameter changed dramatically from one year to the next or if there were differences that could be attributed to seasonal timing. For example, historic studies conducted in the Anchorage watersheds indicated that there were seasonal influences on fecal coliform concentrations, presumably tied to air and water temperatures, where concentrations were generally higher during the summer months and lower during spring and fall (MOA 2003). Most of the measurements taken over the seven years of this study occurred during July and August. Data was collected during one storm event during June and one in October, while seven storm events were sampled in September. With a limited number of storm events sampled outside of the peak summer months, determining seasonal trends is difficult.

Although many differences occurred between years for various parameters, no clear patterns emerged across multiple locations. For example, fecal coliform was clearly higher at one location during 2011, 2012, and 2015, two locations during 2013 and 2014, four locations in 2016, and at three locations in 2017, although SWM07 has stood out each year as having some of the highest fecal coliform levels overall. The two new outfalls, SWM11 and SWM12, also exhibited high fecal coliform levels in 2017. Variability fluctuated between years for other parameters as well. In fact, other than TSS and turbidity, no patterns of multiple parameters correspondingly fluctuating across multiple locations and years emerged.

Even with limited data points outside the peak summer months, some seasonal differences occurred in a few of the parameters. Temperature was higher across all locations in July and August than in early June, September, and October. DO typically fluctuates inversely to temperature with higher DO concentrations during early summer and fall and lower concentrations during mid-summer. This seasonal trend in DO, as plotted against the day of year (DOY), is clear in the regression plot for all sites and years (Figure 26). Although not as consistent or as highly correlated as temperature or DO, fecal coliform followed a similar trend as that seen in temperature. Fecal coliform counts were generally lower during spring and fall and higher during the summer (Figure 26). Seasonal pattern regression values are presented on each plot where the data has been fitted to a second order polynomial. Regression values (R coefficient) were 0.550 for DO, 0.703 for temperature, and 0.234 for fecal coliform.

4.9 Annual Loading

The *Simple Method* to calculate loading estimates was used for determining annual loadings for fecal coliform and hydrocarbons for each of the subbasins that was examined in this study. The Simple Method was developed under an EPA grant to provide Phase II communities with tools to protect their local watersheds (SMRC 2010). This method estimates stormwater runoff pollutant loads for urban areas and requires the following information: subbasin drainage area and percent impervious cover, flow-weighted or event-mean stormwater runoff pollutant concentrations, and annual precipitation. With the Simple Method, calculations can be based on specific land use areas such as residential, commercial, industrial, and roadway to calculate annual pollutant loads for each type of land use. The method can also be used for more

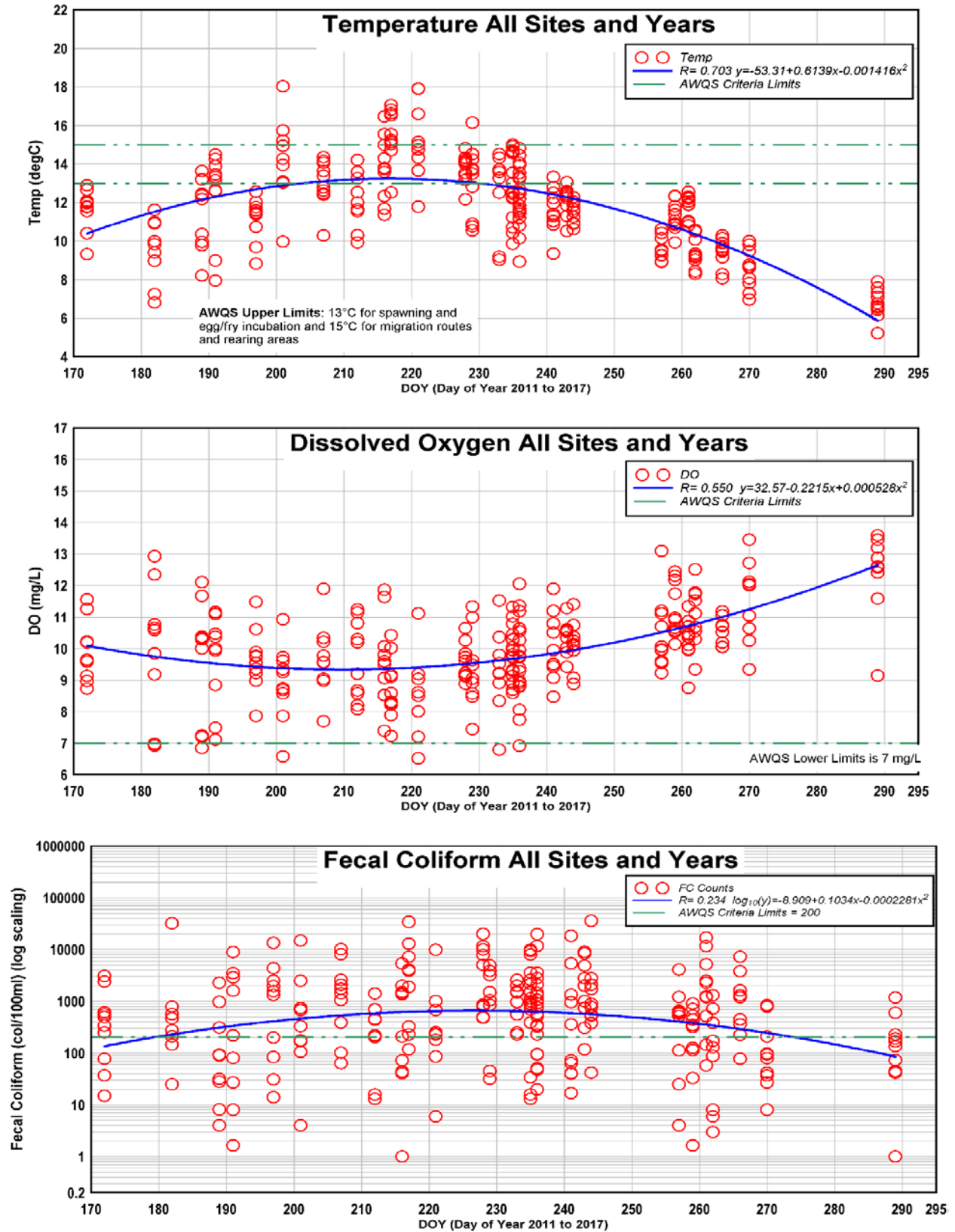


Figure 25. Seasonal Patterns for Temperature, DO, and Fecal Coliform, All Sites and All Years.

generalized pollutant comparisons by 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 2012).

A major limitation for this method is applying data collected from a single grab sample for each storm event rather than using flow-weighted data which would help eliminate some of the high variability. Available documentation for this method does not address its applicability to organic compounds such as petroleum hydrocarbons even though comparisons are provided in this report (SMRC 2010). Loading data are considered estimates that can provide useful information in comparing subbasins and for use as a planning tool, but are not precise enough for comparing similar loading estimates.

Annual loading estimates were determined for fecal coliform and hydrocarbons. For hydrocarbons, only TPAH was examined since all volatile aromatic hydrocarbons were found to be ND except a single sample in 2011, 2012, and 2017. Fecal coliform loading calculations (Figure 27) utilized the annual geometric mean for each location to account for some of the high variability. TPAH loading calculations (Figure 28) utilized the annual arithmetic mean for each location.

SWM07 stands out as the subbasin with the highest annual fecal coliform loading in six of the seven years of the study (Figure 27). During 2015, the fecal loading at SWM07 was substantially lower but has since increased to be the highest again in both 2016 and 2017. In 2015, SWM08 had the highest loading estimate. Other areas with relatively high fecal coliform loading were SWM03 (residential), SWM05 (commercial/industrial), SWM08 (mixed), SWM11 (residential), and SWM12 (commercial/industrial). These locations represent all three of the different land use categories examined in the study (refer to Table 1). The lowest fecal loading values were detected at SWM04 (residential), SWM06 (residential), SWM09 (commercial/industrial), and SWM10 (mixed). SWM10 indicated elevated levels of fecal coliform loading during 2014, although three or the four storm events were in line with historic measurements. With the exception of SWM11, the residential areas were generally lower in fecal coliform loading when compared to the commercial/industrial areas.

Annual hydrocarbon loading, as determined by TPAH measurements, was low at all four locations that were measured (Figure 28). The highest TPAH loading was seen at SWM09, ranging from a low of 0.04 lbs/year in 2016 to a high of 0.17 lbs/year during 2013. Slightly lower levels were seen at both SWM05 and SWM07 during some years with peak concentrations of around 0.08 lbs/year. No clear pattern was noted between the outfalls that contained OGS units (SWM05 and SWM09) versus those that did not (SWM07 and SWM12). SWM05 had some of the lowest loading values while SWM09 had some of the highest. Based on these four locations, and given that they were all similar in size in terms of acreage and were from the commercial/industrial land use categories, the efficacy of the OGS units could not be determined. OGS units may be effective in removing oil, grease, and grit but the hydrocarbons as measured by both TAH and TPAH may not be removed as they are mostly dissolved and likely pass through an OGS.

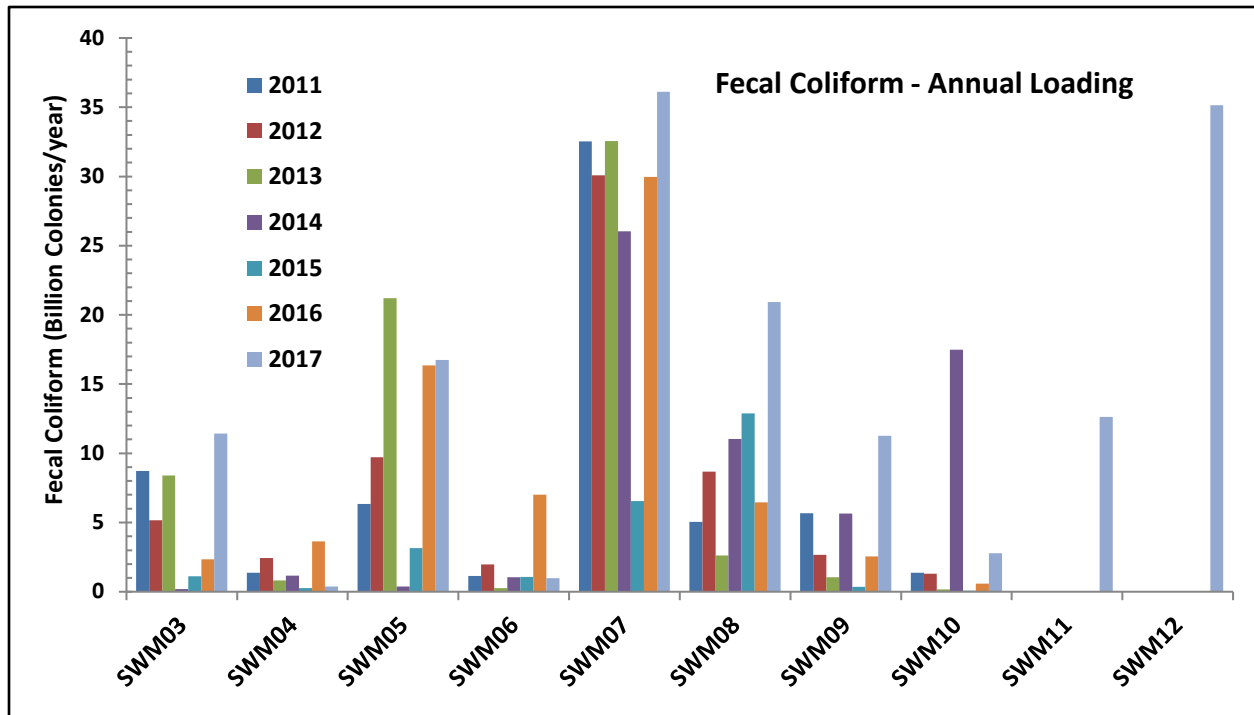


Figure 26. Fecal Coliform Annual Loading by Monitoring Site.

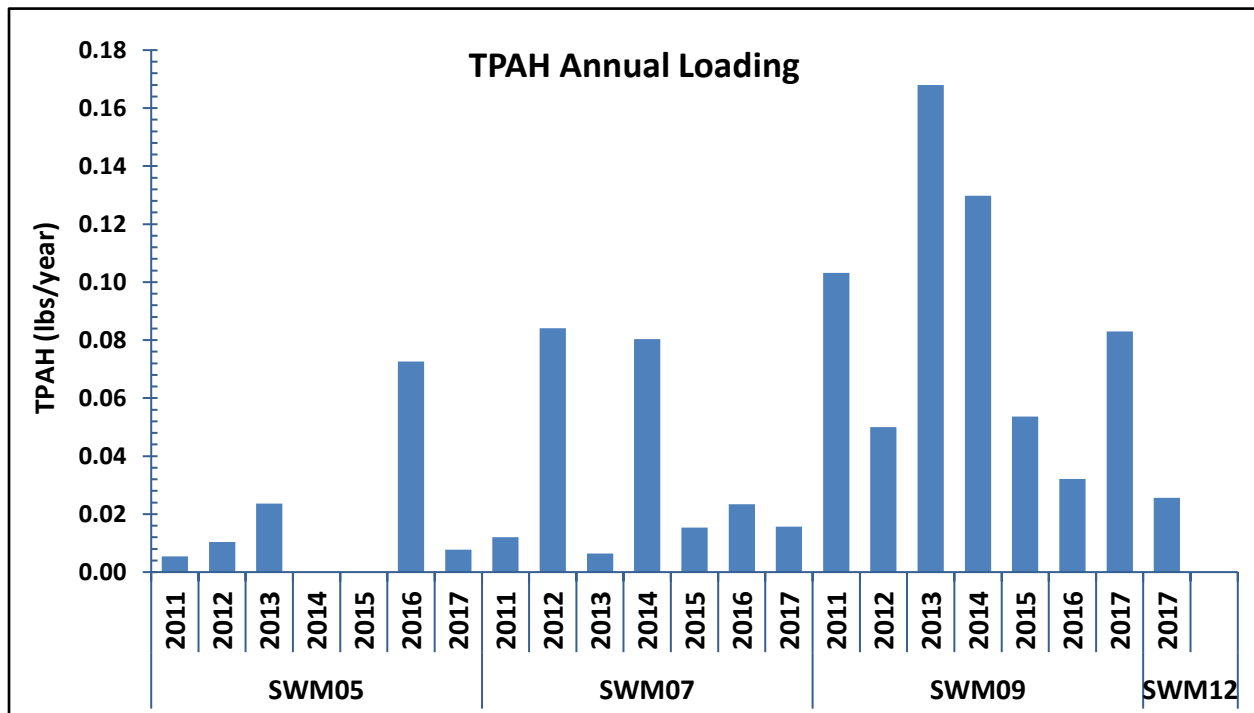


Figure 27. TPAH Annual Loading by Monitoring Site.

Alternatively, there could just be large differences between the four areas examined that make it difficult to determine the effectiveness of the OGS based on this study. The best way to measure the efficacy of an OGS unit would be to take both up- and down-stream measurements so that a direct comparison could be made on the amount of hydrocarbons removed at a specific location. Hydrocarbon concentrations could also be measured in the oil and grit that is collected within the OGS unit itself to obtain a percent removal estimate.

5.0 Summary and Conclusions

This report presents results from the 2017 monitoring and summarizes the results for the entire seven years of sampling conducted under the APDES permit-specified monitoring program. The monitoring program began in 2011 and included sampling at ten representative locations during four storm events each year for a total of 28 storms. Results from this sampling effort allow an initial screening by comparison against all available water quality standards. When benchmark exceedances were identified, the intent was that MOA would determine likely causes and take actions if necessary such as education and outreach or implementation of additional BMPs to reduce the pollutant loading.

The seventh year of monitoring successfully sampled all parameters specified for each of the ten selected outfalls during all four monitoring events meeting the permit requirements. Minor excursions to the QA/QC requirements of the program, including failure to collect two targeted duplicate measurements, did not affect overall data quality.

Overall, there were no significant findings from any of the years 2011 through 2017 that would suggest the need for any special investigations to be initiated at this time. With the exception of elevated fecal coliforms, high TSS/turbidity detected at one location in 2011 and another in 2015, high aromatic hydrocarbons at one location during one storm event in 2012, and one anomalously high copper value in 2016, concentrations of target constituents in the grab samples and in the field measurements were all well within the range of expected values. Although AWQS criteria were commonly exceeded in fecal coliform samples, concentrations were not considered extraordinary and warranting further investigation at this time. Also, it should be noted that AWQS criteria used in this report were for benchmark comparisons purposes only and that any exceedances noted are not considered water quality or permit violations.

The high TSS and turbidity concentrations that were noted at one location during two storm events in 2011 and at a different location during one storm event during 2015 were all believed to be due to commercial construction activities within the subbasins at the time of sampling. Since then, no high turbidity or TSS concentrations have been seen at either location. In 2012, the one high hydrocarbon sample that was collected adjacent to the Seward Highway is believed to have originated from a gasoline-type source as there was no indication that it originated from a combustion source, and BTEX levels in diesel fuel are typically much less. A sample taken at the same location three days later during the subsequent storm event did not detect any volatile hydrocarbons. The field crew contacted the MOA as soon as a problematic result occurred to allow the MOA an opportunity to perform a site inspection and potentially identify the source of the problem. In 2016, a high level of dissolved copper was noted at one location during one storm event, but the cause of this anomalous high value could not be determined.

Data were examined for station, yearly, and seasonal trends to determine if particular locations have pollutant problems, whether significant differences were seen on a year-to-year basis, and whether there were seasonal influences that could be discerned in the data. One location that stood out was SWM07. This location consistently had the highest BOD₅, fecal coliform, TSS, and turbidity concentrations. Although BOD₅ was consistently high, the DO levels were higher than a majority of other locations. High fecal coliform levels at SWM07 were reflected in the annual loading estimates for that location. This site exhibited the highest annual loading of fecal coliform for six of the seven years of the study. The reason for the high levels of fecal loading at this site is unknown as it drains a commercial use area located between the two lanes of the Seward Highway north of Chester Creek and south of 12th Avenue, although the drainage area does include a homeless camp (refer to Figure 7).

Other trends include a general seasonal trend in temperature, DO, and fecal coliform. Temperature and fecal coliform were highest during the mid-summer months and lower in early summer and fall. DO concentrations had an inverse relationship with lower values in the summer and higher values in early summer and fall as would be expected since colder water has a higher DO saturation level.

Hydrocarbon concentrations were examined in four of the ten subbasins that represented commercial/industrial land use category. Two of the locations had OGS units and two did not, which allowed comparisons to be made on their efficacy for stormwater pollutant control. Based on TPAH levels, no differences could be attributed to an OGS unit, although the measurement of TPAH may not be the best parameter to be used in this examination. In general, with the exception of three samples with detectable levels of BTEX, one of which was elevated, all aromatic hydrocarbon concentrations were below detection levels for all seven years of monitoring. TAqH concentrations were also very low and, when compared to ADEC's TAqH water quality standard, were all well below the criteria. Annual hydrocarbon loading was also very low at all four locations.

6.0 References

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- ADEC 2004b. Total Maximum Daily Loads (TMDLs) for Fecal Coliform in the Waters of Furrow Creek in Anchorage, Alaska. Final - March, 2004.
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- MOA 2012. Monitoring, Evaluation, and Quality Assurance Plan (QAP), APDES Permit No. AKS-052558. Prepared for Alaska Department of Environmental Conservation, Division of Water. Prepared by HDR Alaska, Inc. and Municipality of Anchorage. July 2011, revised in October 2012.
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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. U.S. Geological Survey.

Appendix A

Photographs



Photograph 1. Outfall SWM11 (348-3), Johns Road at Botanical Circle.



Photograph 2. Outfall SWM12 (1454-1), Lynwood Retention Basin.



Photograph 3. Outfall SWM03 (1224-1), Fairweather Loop off Sylvan Drive.



Photograph 4. Outfall SWM04 (1224-2), Fairweather Loop off Sylvan Drive.



Photograph 5. Outfall SWM05 (207-1), East 56th Avenue at Save School.



Photograph 6. Outfall SWM06 (314-22), Maplewood Street off of Northern Lights Boulevard.



Photograph 7. Outfall SWM07 (484-1), New Seward Highway at Chester Creek.



Photograph 8. Outfall SWM08 (86-1), New Seward Highway at Chester Creek.



Photograph 9. Outfall SWM09 (499-1), Anchorage Football Stadium & Ben Boeke Ice Arena.



Photograph 10. Outfall SWM10 (525-2), Eagle Street at Chester Creek.

Appendix B

Laboratory Data Packages & Chain of Custodies

Appendix B1

Laboratory Data Package Storm Event #1



Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr
PO Box 196650
Anchorage, AK 99519
907-343-8058

Report Number: **1174875**

Client Project: **MOA Stormwater Management**

Dear Kristi Bischofberger,

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 Forest 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.

Forest Taylor
Project Manager
Forest.Taylor@sgs.com

Date

Print Date: 08/29/2017 11:27:24AM

Case Narrative

SGS Client: **MOA-Project Mnmt/Engr**
SGS Project: **1174875**
Project Name/Site: **MOA Stormwater Management**
Project Contact: **Kristi Bischofberger**

Refer to sample receipt form for information on sample condition.

SWM12-01 (1174875002) PS

8270D SIM - PAH surrogate recovery for terphenyl-d14 (24.67%) does not meet QC criteria. Sample was re-extracted past hold time, with PAH surrogate within QC criteria. Results are comparable.

SWM12-01 DUP (1174875005) PS

8270D SIM - PAH surrogate recovery for terphenyl-d14 (23.49%) does not meet QC criteria. Sample was re-extracted past hold time, with PAH surrogate within QC criteria. Results are comparable.

SWM05-01 (1174875008) PS

8270D SIM - PAH surrogate recovery for terphenyl-d14 (46.5%) does not meet DOD recovery limits but is within in-house recovery limits (29.014%).

SWM07-01 (1174875010) PS

8270D SIM - PAH surrogate recovery for terphenyl-d14 (25.52%) does not meet QC criteria. Sample was re-extracted past hold time, with PAH surrogate within QC criteria. Results are comparable.

SWM12-01 MS (1174875003) BMS

8260C - BMS recovery for P&M Xylene (126%) does not meet QC criteria. Refer to LCS/LCSD for accuracy requirements.

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

8270D SIM - PAH surrogate recovery for parent sample does not meet QC criteria. Sample was re-extracted past hold time, with PAH surrogate within QC criteria. Results are comparable.

SWM12-01 MSD (1174875004) BMSD

8260C - BMSD recovery for P&M Xylene (126%) does not meet QC criteria. Refer to LCS/LCSD for accuracy requirements.

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

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

8270D SIM - PAH surrogate recovery for parent sample does not meet QC criteria. Sample was re-extracted past hold time, with PAH surrogate within QC criteria. Results are comparable.

1174875013DUP (1401046) 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.

1174894003DUP (1401047) DUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. Both sample and duplicate concentrations are less than the LOQ.

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

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)				
1174875013	SWM09-01	XMS10266	Benzo[k]fluoranthene	RP
1400775	LCS for HBN 1764585 [XXX/37990	XMS10266	Anthracene	BLC
1400775	LCS for HBN 1764585 [XXX/37990	XMS10266	Benzo[k]fluoranthene	BLC
1400776	LCSD for HBN 1764585 [XXX/3799	XMS10266	Anthracene	BLC

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. 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) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). 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
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>
SWM11-01	1174875001	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM12-01	1174875002	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM12-01 MS	1174875003	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM12-01 MSD	1174875004	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM12-01 DUP	1174875005	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM03-01	1174875006	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM04-01	1174875007	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM05-01	1174875008	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM06-01	1174875009	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM07-01	1174875010	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM08-01	1174875011	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM08-01 DUP	1174875012	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM09-01	1174875013	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
SWM10-01	1174875014	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)
Trip Blank	1174875015	07/26/2017	07/26/2017	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
EPA 602/624	602 Aromatics by 624 (W)
EPA 625M SIM (PAH)	625 Semi-Volatiles GC/MS Liq/Liq ext.
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

Detectable Results Summary

Client Sample ID: **SWM11-01**

Lab Sample ID: 1174875001

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	8.54	ug/L
Calcium	12800	ug/L
Hardness as CaCO ₃	39.0	mg/L
Magnesium	1710	ug/L
Biochemical Oxygen Demand	7.20	mg/L
Fecal Coliform	1430	col/100mL
Total Suspended Solids	22.7	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM12-01**

Lab Sample ID: 1174875002

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	7.91	ug/L
Calcium	18600	ug/L
Hardness as CaCO ₃	62.9	mg/L
Magnesium	4030	ug/L
Biochemical Oxygen Demand	7.35	mg/L
Fecal Coliform	8100	col/100mL
Benzo[b]Fluoranthene	0.0162	ug/L
Benzo[g,h,i]perylene	0.0167	ug/L
Fluoranthene	0.0371	ug/L
Pyrene	0.0521	ug/L
Total Suspended Solids	93.5	mg/L

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

Client Sample ID: **SWM12-01 DUP**

Lab Sample ID: 1174875005

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	8.32	ug/L
Calcium	18900	ug/L
Hardness as CaCO ₃	64.8	mg/L
Magnesium	4290	ug/L
Biochemical Oxygen Demand	7.65	mg/L
Fecal Coliform	6200	col/100mL
Benzo[b]Fluoranthene	0.0159	ug/L
Benzo[g,h,i]perylene	0.0169	ug/L
Chrysene	0.0152	ug/L
Fluoranthene	0.0353	ug/L
Total Suspended Solids	93.5	mg/L

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

Client Sample ID: **SWM03-01**

Lab Sample ID: 1174875006

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.76	ug/L
Calcium	15800	ug/L
Hardness as CaCO ₃	64.9	mg/L
Magnesium	6170	ug/L
Biochemical Oxygen Demand	2.19	mg/L
Fecal Coliform	2600	col/100mL
Total Suspended Solids	6.34	mg/L

Microbiology Laboratory

Waters Department

Detectable Results Summary

Client Sample ID: **SWM04-01**

Lab Sample ID: 1174875007

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.45	ug/L
Calcium	32000	ug/L
Hardness as CaCO ₃	121	mg/L
Magnesium	10000	ug/L
Biochemical Oxygen Demand	4.81	mg/L
Fecal Coliform	102	col/100mL
Total Suspended Solids	13.8	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM05-01**

Lab Sample ID: 1174875008

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	12.1	ug/L
Calcium	17600	ug/L
Hardness as CaCO ₃	60.1	mg/L
Magnesium	3940	ug/L
Biochemical Oxygen Demand	3.34	mg/L
Fecal Coliform	10200	col/100mL
Fluoranthene	0.0178	ug/L
Total Suspended Solids	12.4	mg/L

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

Client Sample ID: **SWM06-01**

Lab Sample ID: 1174875009

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.82	ug/L
Calcium	8290	ug/L
Hardness as CaCO ₃	30.4	mg/L
Magnesium	2350	ug/L
Fecal Coliform	390	col/100mL
Total Suspended Solids	6.70	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM07-01**

Lab Sample ID: 1174875010

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	8.35	ug/L
Calcium	6140	ug/L
Hardness as CaCO ₃	19.6	mg/L
Magnesium	1040	ug/L
Biochemical Oxygen Demand	4.05	mg/L
Fecal Coliform	1760	col/100mL
Fluoranthene	0.0192	ug/L
Total Suspended Solids	23.8	mg/L

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

Detectable Results Summary

Client Sample ID: **SWM08-01**

Lab Sample ID: 1174875011

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	4.50	ug/L
Calcium	11000	ug/L
Hardness as CaCO ₃	38.0	mg/L
Magnesium	2530	ug/L
Biochemical Oxygen Demand	3.46	mg/L
Fecal Coliform	1060	col/100mL
Total Suspended Solids	11.0	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM08-01 DUP**

Lab Sample ID: 1174875012

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	4.54	ug/L
Calcium	11000	ug/L
Hardness as CaCO ₃	37.6	mg/L
Magnesium	2490	ug/L
Biochemical Oxygen Demand	3.49	mg/L
Fecal Coliform	1200	col/100mL
Total Suspended Solids	11.4	mg/L

Microbiology Laboratory

Waters Department

Client Sample ID: **SWM09-01**

Lab Sample ID: 1174875013

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

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	1.94	ug/L
Calcium	30500	ug/L
Hardness as CaCO ₃	106	mg/L
Magnesium	7290	ug/L
Fecal Coliform	2100	col/100mL
Benzo[a]pyrene	0.00831	ug/L
Benzo[b]Fluoranthene	0.0234	ug/L
Chrysene	0.0356	ug/L
Fluoranthene	0.0878	ug/L
Pyrene	0.0542	ug/L
Total Suspended Solids	6.73	mg/L

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

Client Sample ID: **SWM10-01**

Lab Sample ID: 1174875014

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	28600	ug/L
Hardness as CaCO ₃	100	mg/L
Magnesium	7040	ug/L
Fecal Coliform	64	col/100mL
Total Suspended Solids	2.78	mg/L

Microbiology Laboratory

Waters Department



Results of SWM11-01

Client Sample ID: **SWM11-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875001
Lab Project ID: 1174875

Collection Date: 07/26/17 09:15
Received Date: 07/26/17 15:13
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	8.54	1.00	0.310	ug/L	1		07/28/17 18:39

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 18:39
Container ID: 1174875001-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of SWM11-01

Client Sample ID: SWM11-01
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875001
Lab Project ID: 1174875

Collection Date: 07/26/17 09:15
Received Date: 07/26/17 15:13
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Calcium and Magnesium.

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 18:39
Container ID: 1174875001-C
Prep Batch: MX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row includes Hardness as CaCO3.

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 18:39
Container ID: 1174875001-C
Prep Batch: MX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of SWM11-01

Client Sample ID: **SWM11-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875001
Lab Project ID: 1174875

Collection Date: 07/26/17 09:15
Received Date: 07/26/17 15:13
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	7.20	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875001-E

<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	1430	9.09	9.09	col/100mL	1		07/26/17 17:12

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 17:12
Container ID: 1174875001-A

Print Date: 08/29/2017 11:27:30AM

Results of SWM11-01

Client Sample ID: **SWM11-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875001
 Lab Project ID: 1174875

Collection Date: 07/26/17 09:15
 Received Date: 07/26/17 15:13
 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	22.7	3.33	1.03	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875001-D

Print Date: 08/29/2017 11:27:30AM

Results of SWM12-01

Client Sample ID: **SWM12-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875002
 Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
 Received Date: 07/26/17 15:13
 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	7.91	1.00	0.310	ug/L	1		07/28/17 18:45

Batch Information

Analytical Batch: MMS9876
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 07/28/17 18:45
 Container ID: 1174875002-H

Prep Batch: MXX30861
 Prep Method: E200.2
 Prep Date/Time: 07/28/17 07:15
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM12-01**

Client Sample ID: **SWM12-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875002
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
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	500	150	ug/L	1		07/28/17 18:45
Magnesium	4030	50.0	15.0	ug/L	1		07/28/17 18:45

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 18:45
Container ID: 1174875002-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
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	62.9	5.00	5.00	mg/L	1		07/28/17 18:45

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 18:45
Container ID: 1174875002-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM12-01**

Client Sample ID: **SWM12-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875002
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
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	7.35	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875002-J

<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	8100	100	100	col/100mL	1		07/26/17 17:25

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 17:25
Container ID: 1174875002-F

Print Date: 08/29/2017 11:27:30AM



Results of SWM12-01

Client Sample ID: SWM12-01
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875002
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
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 detection results.

Batch Information

Analytical Batch: XMS10269
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 08/02/17 01:49
Container ID: 1174875002-A

Prep Batch: XXX37990
Prep Method: SW3520C
Prep Date/Time: 07/27/17 08:44
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL



Results of SWM12-01

Client Sample ID: SWM12-01
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875002
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzene, Chlorobenzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and Surrogates (1,2-Dichloroethane-D4, 4-Bromofluorobenzene, Toluene-d8).

Batch Information

Analytical Batch: VMS16996
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 07/27/17 15:00
Container ID: 1174875002-C

Prep Batch: VXX30969
Prep Method: SW5030B
Prep Date/Time: 07/27/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of SWM12-01

Client Sample ID: **SWM12-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875002
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
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	93.5	5.00	1.55	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 07/27/17 18:01
Container ID: 1174875002-I

Print Date: 08/29/2017 11:27:30AM

Results of SWM12-01 DUP

Client Sample ID: **SWM12-01 DUP**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875005
 Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
 Received Date: 07/26/17 15:13
 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	8.32	1.00	0.310	ug/L	1		07/28/17 19:18

Batch Information

Analytical Batch: MMS9876
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 07/28/17 19:18
 Container ID: 1174875005-H

Prep Batch: MXX30861
 Prep Method: E200.2
 Prep Date/Time: 07/28/17 07:15
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of SWM12-01 DUP

Client Sample ID: SWM12-01 DUP
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875005
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Calcium and Magnesium.

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:18
Container ID: 1174875005-H
Prep Batch: MX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row includes Hardness as CaCO3.

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:18
Container ID: 1174875005-H
Prep Batch: MX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of SWM12-01 DUP

Client Sample ID: **SWM12-01 DUP**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875005
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
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	7.65	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875005-J

<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	6200	100	100	col/100mL	1		07/26/17 17:25

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 17:25
Container ID: 1174875005-F

Print Date: 08/29/2017 11:27:30AM



Results of SWM12-01 DUP

Client Sample ID: SWM12-01 DUP
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875005
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
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 detection results.

Batch Information

Analytical Batch: XMS10269
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 08/02/17 02:51
Container ID: 1174875005-A

Prep Batch: XXX37990
Prep Method: SW3520C
Prep Date/Time: 07/27/17 08:44
Prep Initial Wt./Vol.: 950 mL
Prep Extract Vol: 1 mL



Results of SWM12-01 DUP

Client Sample ID: SWM12-01 DUP
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875005
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzene, Chlorobenzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and Surrogates (1,2-Dichloroethane-D4, 4-Bromofluorobenzene, Toluene-d8).

Batch Information

Analytical Batch: VMS16996
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 07/27/17 15:17
Container ID: 1174875005-C

Prep Batch: VXX30969
Prep Method: SW5030B
Prep Date/Time: 07/27/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/29/2017 11:27:30AM



Results of SWM12-01 DUP

Client Sample ID: **SWM12-01 DUP**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875005
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
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	93.5	5.00	1.55	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 07/27/17 18:01
Container ID: 1174875005-I

Print Date: 08/29/2017 11:27:30AM

Results of SWM03-01

Client Sample ID: **SWM03-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875006
 Lab Project ID: 1174875

Collection Date: 07/26/17 11:05
 Received Date: 07/26/17 15:13
 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	3.76	1.00	0.310	ug/L	1		07/28/17 19:24

Batch Information

Analytical Batch: MMS9876
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 07/28/17 19:24
 Container ID: 1174875006-C

Prep Batch: MXX30861
 Prep Method: E200.2
 Prep Date/Time: 07/28/17 07:15
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM03-01**

Client Sample ID: **SWM03-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875006
Lab Project ID: 1174875

Collection Date: 07/26/17 11:05
Received Date: 07/26/17 15:13
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	15800	500	150	ug/L	1		07/28/17 19:24
Magnesium	6170	50.0	15.0	ug/L	1		07/28/17 19:24

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:24
Container ID: 1174875006-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
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	64.9	5.00	5.00	mg/L	1		07/28/17 19:24

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:24
Container ID: 1174875006-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM03-01**

Client Sample ID: **SWM03-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875006
Lab Project ID: 1174875

Collection Date: 07/26/17 11:05
Received Date: 07/26/17 15:13
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	2.19	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875006-E

<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	2600	100	100	col/100mL	1		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 18:12
Container ID: 1174875006-A

Print Date: 08/29/2017 11:27:30AM

Results of SWM03-01

Client Sample ID: **SWM03-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875006
 Lab Project ID: 1174875

Collection Date: 07/26/17 11:05
 Received Date: 07/26/17 15:13
 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	6.34	1.08	0.333	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875006-D

Print Date: 08/29/2017 11:27:30AM

Results of SWM04-01

Client Sample ID: **SWM04-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875007
 Lab Project ID: 1174875

Collection Date: 07/26/17 11:10
 Received Date: 07/26/17 15:13
 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	3.45	1.00	0.310	ug/L	1		07/28/17 19:27

Batch Information

Analytical Batch: MMS9876
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 07/28/17 19:27
 Container ID: 1174875007-C

Prep Batch: MXX30861
 Prep Method: E200.2
 Prep Date/Time: 07/28/17 07:15
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM04-01**

Client Sample ID: **SWM04-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875007
Lab Project ID: 1174875

Collection Date: 07/26/17 11:10
Received Date: 07/26/17 15:13
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	32000	500	150	ug/L	1		07/28/17 19:27
Magnesium	10000	50.0	15.0	ug/L	1		07/28/17 19:27

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:27
Container ID: 1174875007-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
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	121	5.00	5.00	mg/L	1		07/28/17 19:27

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:27
Container ID: 1174875007-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM

Results of SWM04-01

Client Sample ID: **SWM04-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875007
 Lab Project ID: 1174875

Collection Date: 07/26/17 11:10
 Received Date: 07/26/17 15:13
 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	4.81	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 07/26/17 20:23
 Container ID: 1174875007-E

<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	102	2.00	2.00	col/100mL	1		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 07/26/17 18:12
 Container ID: 1174875007-A

Results of SWM04-01

Client Sample ID: **SWM04-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875007
 Lab Project ID: 1174875

Collection Date: 07/26/17 11:10
 Received Date: 07/26/17 15:13
 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	13.8	1.01	0.313	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875007-D

Print Date: 08/29/2017 11:27:30AM



Results of **SWM05-01**

Client Sample ID: **SWM05-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875008
Lab Project ID: 1174875

Collection Date: 07/26/17 11:35
Received Date: 07/26/17 15:13
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	12.1	1.00	0.310	ug/L	1		07/28/17 19:30

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:30
Container ID: 1174875008-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM

Results of SWM05-01

Client Sample ID: **SWM05-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875008
 Lab Project ID: 1174875

Collection Date: 07/26/17 11:35
 Received Date: 07/26/17 15:13
 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	17600	500	150	ug/L	1		07/28/17 19:30
Magnesium	3940	50.0	15.0	ug/L	1		07/28/17 19:30

Batch Information

Analytical Batch: MMS9876
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 07/28/17 19:30
 Container ID: 1174875008-H

Prep Batch: MXX30861
 Prep Method: E200.2
 Prep Date/Time: 07/28/17 07:15
 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	60.1	5.00	5.00	mg/L	1		07/28/17 19:30

Batch Information

Analytical Batch: MMS9876
 Analytical Method: SM21 2340B
 Analyst: VDL
 Analytical Date/Time: 07/28/17 19:30
 Container ID: 1174875008-H

Prep Batch: MXX30861
 Prep Method: E200.2
 Prep Date/Time: 07/28/17 07:15
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM05-01**

Client Sample ID: **SWM05-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875008
Lab Project ID: 1174875

Collection Date: 07/26/17 11:35
Received Date: 07/26/17 15:13
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	3.34	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875008-J

<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	10200	100	100	col/100mL	1		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 18:12
Container ID: 1174875008-F

Print Date: 08/29/2017 11:27:30AM



Results of **SWM05-01**

Client Sample ID: **SWM05-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875008
Lab Project ID: 1174875

Collection Date: 07/26/17 11:35
Received Date: 07/26/17 15:13
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	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Acenaphthylene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Anthracene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Benzo(a)Anthracene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Benzo[a]pyrene	0.00515 U	0.00515	0.00155	ug/L	1		08/01/17 17:32
Benzo[b]Fluoranthene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Benzo[g,h,i]perylene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Benzo[k]fluoranthene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Chrysene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Dibenzo[a,h]anthracene	0.00515 U	0.00515	0.00155	ug/L	1		08/01/17 17:32
Fluoranthene	0.0178	0.0129	0.00381	ug/L	1		08/01/17 17:32
Fluorene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Indeno[1,2,3-c,d] pyrene	0.0129 U	0.0129	0.00381	ug/L	1		08/01/17 17:32
Naphthalene	0.0258 U	0.0258	0.00804	ug/L	1		08/01/17 17:32
Phenanthrene	0.0515 U	0.0515	0.00381	ug/L	1		08/01/17 17:32
Pyrene	0.0515 U	0.0515	0.00381	ug/L	1		08/01/17 17:32
Surrogates							
2-Fluorobiphenyl (surr)	71.2	53-106		%	1		08/01/17 17:32
Terphenyl-d14 (surr)	46.5 *	58-132		%	1		08/01/17 17:32

Batch Information

Analytical Batch: XMS10266
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 08/01/17 17:32
Container ID: 1174875008-A

Prep Batch: XXX37990
Prep Method: SW3520C
Prep Date/Time: 07/27/17 08:44
Prep Initial Wt./Vol.: 970 mL
Prep Extract Vol: 1 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM05-01**

Client Sample ID: **SWM05-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875008
Lab Project ID: 1174875

Collection Date: 07/26/17 11:35
Received Date: 07/26/17 15:13
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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:35
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:35
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		07/27/17 15:35
Benzene	0.400 U	0.400	0.120	ug/L	1		07/27/17 15:35
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		07/27/17 15:35
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:35
o-Xylene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:35
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		07/27/17 15:35
Toluene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:35
Surrogates							
1,2-Dichloroethane-D4 (surr)	98.8	81-118		%	1		07/27/17 15:35
4-Bromofluorobenzene (surr)	104	85-114		%	1		07/27/17 15:35
Toluene-d8 (surr)	109	89-112		%	1		07/27/17 15:35

Batch Information

Analytical Batch: VMS16996
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 07/27/17 15:35
Container ID: 1174875008-C

Prep Batch: VXX30969
Prep Method: SW5030B
Prep Date/Time: 07/27/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/29/2017 11:27:30AM

Results of SWM05-01

Client Sample ID: **SWM05-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875008
 Lab Project ID: 1174875

Collection Date: 07/26/17 11:35
 Received Date: 07/26/17 15:13
 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	12.4	1.00	0.310	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875008-I

Print Date: 08/29/2017 11:27:30AM



Results of SWM06-01

Client Sample ID: **SWM06-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875009
Lab Project ID: 1174875

Collection Date: 07/26/17 12:05
Received Date: 07/26/17 15:13
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	2.82	1.00	0.310	ug/L	1		07/28/17 19:33

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:33
Container ID: 1174875009-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM06-01**

Client Sample ID: **SWM06-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875009
Lab Project ID: 1174875

Collection Date: 07/26/17 12:05
Received Date: 07/26/17 15:13
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	8290	500	150	ug/L	1		07/28/17 19:33
Magnesium	2350	50.0	15.0	ug/L	1		07/28/17 19:33

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:33
Container ID: 1174875009-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
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		07/28/17 19:33

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:33
Container ID: 1174875009-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM

Results of SWM06-01

Client Sample ID: **SWM06-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875009
 Lab Project ID: 1174875

Collection Date: 07/26/17 12:05
 Received Date: 07/26/17 15:13
 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		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 07/26/17 20:23
 Container ID: 1174875009-E

<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	390	10.0	10.0	col/100mL	1		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 07/26/17 18:12
 Container ID: 1174875009-A

Results of SWM06-01

Client Sample ID: **SWM06-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875009
 Lab Project ID: 1174875

Collection Date: 07/26/17 12:05
 Received Date: 07/26/17 15:13
 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	6.70	1.06	0.330	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875009-D

Print Date: 08/29/2017 11:27:30AM



Results of SWM07-01

Client Sample ID: **SWM07-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875010
Lab Project ID: 1174875

Collection Date: 07/26/17 12:40
Received Date: 07/26/17 15:13
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	8.35	1.00	0.310	ug/L	1		07/28/17 19:36

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:36
Container ID: 1174875010-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM07-01**

Client Sample ID: **SWM07-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875010
Lab Project ID: 1174875

Collection Date: 07/26/17 12:40
Received Date: 07/26/17 15:13
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	6140	500	150	ug/L	1		07/28/17 19:36
Magnesium	1040	50.0	15.0	ug/L	1		07/28/17 19:36

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:36
Container ID: 1174875010-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
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	19.6	5.00	5.00	mg/L	1		07/28/17 19:36

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:36
Container ID: 1174875010-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM07-01**

Client Sample ID: **SWM07-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875010
Lab Project ID: 1174875

Collection Date: 07/26/17 12:40
Received Date: 07/26/17 15:13
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	4.05	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875010-J

<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	1760	9.09	9.09	col/100mL	1		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 18:12
Container ID: 1174875010-F

Print Date: 08/29/2017 11:27:30AM



Results of SWM07-01

Client Sample ID: SWM07-01
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875010
Lab Project ID: 1174875

Collection Date: 07/26/17 12:40
Received Date: 07/26/17 15:13
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 detection results.

Batch Information

Analytical Batch: XMS10269
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 08/02/17 03:11
Container ID: 1174875010-A

Prep Batch: XXX37990
Prep Method: SW3520C
Prep Date/Time: 07/27/17 08:44
Prep Initial Wt./Vol.: 990 mL
Prep Extract Vol: 1 mL



Results of **SWM07-01**

Client Sample ID: **SWM07-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875010
Lab Project ID: 1174875

Collection Date: 07/26/17 12:40
Received Date: 07/26/17 15:13
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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:53
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:53
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		07/27/17 15:53
Benzene	0.400 U	0.400	0.120	ug/L	1		07/27/17 15:53
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		07/27/17 15:53
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:53
o-Xylene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:53
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		07/27/17 15:53
Toluene	1.00 U	1.00	0.310	ug/L	1		07/27/17 15:53
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	81-118		%	1		07/27/17 15:53
4-Bromofluorobenzene (surr)	103	85-114		%	1		07/27/17 15:53
Toluene-d8 (surr)	107	89-112		%	1		07/27/17 15:53

Batch Information

Analytical Batch: VMS16996
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 07/27/17 15:53
Container ID: 1174875010-C

Prep Batch: VXX30969
Prep Method: SW5030B
Prep Date/Time: 07/27/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/29/2017 11:27:30AM

Results of SWM07-01

Client Sample ID: **SWM07-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875010
 Lab Project ID: 1174875

Collection Date: 07/26/17 12:40
 Received Date: 07/26/17 15:13
 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	23.8	2.00	0.620	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875010-I

Print Date: 08/29/2017 11:27:30AM



Results of SWM08-01

Client Sample ID: **SWM08-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875011
Lab Project ID: 1174875

Collection Date: 07/26/17 13:00
Received Date: 07/26/17 15:13
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	4.50	1.00	0.310	ug/L	1		07/28/17 19:39

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:39
Container ID: 1174875011-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM08-01**

Client Sample ID: **SWM08-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875011
Lab Project ID: 1174875

Collection Date: 07/26/17 13:00
Received Date: 07/26/17 15:13
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	11000	500	150	ug/L	1		07/28/17 19:39
Magnesium	2530	50.0	15.0	ug/L	1		07/28/17 19:39

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:39
Container ID: 1174875011-C

Prep Batch: MX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
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	38.0	5.00	5.00	mg/L	1		07/28/17 19:39

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:39
Container ID: 1174875011-C

Prep Batch: MX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM08-01**

Client Sample ID: **SWM08-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875011
Lab Project ID: 1174875

Collection Date: 07/26/17 13:00
Received Date: 07/26/17 15:13
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	3.46	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875011-E

<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		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 18:12
Container ID: 1174875011-A

Print Date: 08/29/2017 11:27:30AM

Results of SWM08-01

Client Sample ID: **SWM08-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875011
 Lab Project ID: 1174875

Collection Date: 07/26/17 13:00
 Received Date: 07/26/17 15:13
 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	11.0	2.00	0.620	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875011-D

Print Date: 08/29/2017 11:27:30AM



Results of **SWM08-01 DUP**

Client Sample ID: **SWM08-01 DUP**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875012
Lab Project ID: 1174875

Collection Date: 07/26/17 13:00
Received Date: 07/26/17 15:13
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	4.54	1.00	0.310	ug/L	1		07/28/17 19:42

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:42
Container ID: 1174875012-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of SWM08-01 DUP

Client Sample ID: SWM08-01 DUP
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875012
Lab Project ID: 1174875

Collection Date: 07/26/17 13:00
Received Date: 07/26/17 15:13
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows for Calcium and Magnesium.

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:42
Container ID: 1174875012-C
Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row for Hardness as CaCO3.

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:42
Container ID: 1174875012-C
Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM08-01 DUP**

Client Sample ID: **SWM08-01 DUP**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875012
Lab Project ID: 1174875

Collection Date: 07/26/17 13:00
Received Date: 07/26/17 15:13
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	3.49	2.00	2.00	mg/L	1		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875012-E

<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	1200	9.09	9.09	col/100mL	1		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 18:12
Container ID: 1174875012-A

Print Date: 08/29/2017 11:27:30AM



Results of SWM08-01 DUP

Client Sample ID: **SWM08-01 DUP**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875012
Lab Project ID: 1174875

Collection Date: 07/26/17 13:00
Received Date: 07/26/17 15:13
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	11.4	1.01	0.313	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 07/27/17 18:01
Container ID: 1174875012-D

Print Date: 08/29/2017 11:27:30AM



Results of SWM09-01

Client Sample ID: **SWM09-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875013
Lab Project ID: 1174875

Collection Date: 07/26/17 14:10
Received Date: 07/26/17 15:13
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	1.94	1.00	0.310	ug/L	1		07/28/17 19:51

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:51
Container ID: 1174875013-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM09-01**

Client Sample ID: **SWM09-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875013
Lab Project ID: 1174875

Collection Date: 07/26/17 14:10
Received Date: 07/26/17 15:13
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	30500	500	150	ug/L	1		07/28/17 19:51
Magnesium	7290	50.0	15.0	ug/L	1		07/28/17 19:51

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:51
Container ID: 1174875013-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
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	106	5.00	5.00	mg/L	1		07/28/17 19:51

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:51
Container ID: 1174875013-H

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM09-01**

Client Sample ID: **SWM09-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875013
Lab Project ID: 1174875

Collection Date: 07/26/17 14:10
Received Date: 07/26/17 15:13
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		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 07/26/17 20:23
Container ID: 1174875013-J

<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		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 07/26/17 18:12
Container ID: 1174875013-F

Print Date: 08/29/2017 11:27:30AM



Results of SWM09-01

Client Sample ID: SWM09-01
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1174875013
Lab Project ID: 1174875

Collection Date: 07/26/17 14:10
Received Date: 07/26/17 15:13
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: XMS10266
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 08/01/17 18:13
Container ID: 1174875013-A

Prep Batch: XXX37990
Prep Method: SW3520C
Prep Date/Time: 07/27/17 08:44
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL



Results of **SWM09-01**

Client Sample ID: **SWM09-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875013
Lab Project ID: 1174875

Collection Date: 07/26/17 14:10
Received Date: 07/26/17 15:13
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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 16:10
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 16:10
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		07/27/17 16:10
Benzene	0.400 U	0.400	0.120	ug/L	1		07/27/17 16:10
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		07/27/17 16:10
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 16:10
o-Xylene	1.00 U	1.00	0.310	ug/L	1		07/27/17 16:10
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		07/27/17 16:10
Toluene	1.00 U	1.00	0.310	ug/L	1		07/27/17 16:10
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		07/27/17 16:10
4-Bromofluorobenzene (surr)	101	85-114		%	1		07/27/17 16:10
Toluene-d8 (surr)	109	89-112		%	1		07/27/17 16:10

Batch Information

Analytical Batch: VMS16996
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 07/27/17 16:10
Container ID: 1174875013-C

Prep Batch: VXX30969
Prep Method: SW5030B
Prep Date/Time: 07/27/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/29/2017 11:27:30AM

Results of SWM09-01

Client Sample ID: **SWM09-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875013
 Lab Project ID: 1174875

Collection Date: 07/26/17 14:10
 Received Date: 07/26/17 15:13
 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	6.73	2.04	0.633	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875013-I

Print Date: 08/29/2017 11:27:30AM



Results of SWM10-01

Client Sample ID: **SWM10-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875014
Lab Project ID: 1174875

Collection Date: 07/26/17 13:46
Received Date: 07/26/17 15:13
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	1.00 U	1.00	0.310	ug/L	1		07/28/17 19:54

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:54
Container ID: 1174875014-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM



Results of **SWM10-01**

Client Sample ID: **SWM10-01**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875014
Lab Project ID: 1174875

Collection Date: 07/26/17 13:46
Received Date: 07/26/17 15:13
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	28600	500	150	ug/L	1		07/28/17 19:54
Magnesium	7040	50.0	15.0	ug/L	1		07/28/17 19:54

Batch Information

Analytical Batch: MMS9876
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 07/28/17 19:54
Container ID: 1174875014-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
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	100	5.00	5.00	mg/L	1		07/28/17 19:54

Batch Information

Analytical Batch: MMS9876
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 07/28/17 19:54
Container ID: 1174875014-C

Prep Batch: MXX30861
Prep Method: E200.2
Prep Date/Time: 07/28/17 07:15
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 08/29/2017 11:27:30AM

Results of SWM10-01

Client Sample ID: **SWM10-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875014
 Lab Project ID: 1174875

Collection Date: 07/26/17 13:46
 Received Date: 07/26/17 15:13
 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		07/26/17 20:23

Batch Information

Analytical Batch: BOD5810
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 07/26/17 20:23
 Container ID: 1174875014-E

<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	64	2.00	2.00	col/100mL	1		07/26/17 18:12

Batch Information

Analytical Batch: BTF15818
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 07/26/17 18:12
 Container ID: 1174875014-A

Print Date: 08/29/2017 11:27:30AM

Results of SWM10-01

Client Sample ID: **SWM10-01**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1174875014
 Lab Project ID: 1174875

Collection Date: 07/26/17 13:46
 Received Date: 07/26/17 15:13
 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	2.78	1.03	0.320	mg/L	1		07/27/17 18:01

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 07/27/17 18:01
 Container ID: 1174875014-D

Print Date: 08/29/2017 11:27:30AM



Results of Trip Blank

Client Sample ID: **Trip Blank**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1174875015
Lab Project ID: 1174875

Collection Date: 07/26/17 10:30
Received Date: 07/26/17 15:13
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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 14:42
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 14:42
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		07/27/17 14:42
Benzene	0.400 U	0.400	0.120	ug/L	1		07/27/17 14:42
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		07/27/17 14:42
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		07/27/17 14:42
o-Xylene	1.00 U	1.00	0.310	ug/L	1		07/27/17 14:42
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		07/27/17 14:42
Toluene	1.00 U	1.00	0.310	ug/L	1		07/27/17 14:42
Surrogates							
1,2-Dichloroethane-D4 (surr)	99.1	81-118		%	1		07/27/17 14:42
4-Bromofluorobenzene (surr)	104	85-114		%	1		07/27/17 14:42
Toluene-d8 (surr)	107	89-112		%	1		07/27/17 14:42

Batch Information

Analytical Batch: VMS16996
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 07/27/17 14:42
Container ID: 1174875015-A

Prep Batch: VXX30969
Prep Method: SW5030B
Prep Date/Time: 07/27/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 08/29/2017 11:27:30AM

Method Blank

Blank ID: MB for HBN 1764576 [BOD/5810]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1400746

QC for Samples:

1174875001, 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009, 1174875010, 1174875011, 1174875012, 1174875013, 1174875014

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: BOD5810

Analytical Method: SM21 5210B

Instrument:

Analyst: AKD

Analytical Date/Time: 7/26/2017 8:23:00PM

Print Date: 08/29/2017 11:27:52AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1174875 [BOD5810]

Blank Spike Lab ID: 1400747

Date Analyzed: 07/26/2017 20:23

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1174875001, 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009,
1174875010, 1174875011, 1174875012, 1174875013, 1174875014

Results by SM21 5210B

Parameter	Blank Spike (mg/L)			CL
	Spike	Result	Rec (%)	
Biochemical Oxygen Demand	198	192	97	(84.6-115.4

Batch Information

Analytical Batch: **BOD5810**

Analytical Method: **SM21 5210B**

Instrument:

Analyst: **AKD**

Print Date: 08/29/2017 11:27:53AM

Method Blank

Blank ID: MB for HBN 1764535 [BTF/15818]
Blank Lab ID: 1400751

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1174875001, 1174875002, 1174875005

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: BTF15818
Analytical Method: SM21 9222D
Instrument:
Analyst: K.W
Analytical Date/Time: 7/26/2017 5:12:00PM

Print Date: 08/29/2017 11:27:54AM



Method Blank

Blank ID: MB for HBN 1764535 [BTF/15818]
Blank Lab ID: 1400752

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1174875001, 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009, 1174875010, 1174875011, 1174875012, 1174875013, 1174875014

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: BTF15818
Analytical Method: SM21 9222D
Instrument:
Analyst: K.W
Analytical Date/Time: 7/26/2017 6:12:00PM

Print Date: 08/29/2017 11:27:54AM

Method Blank

Blank ID: MB for HBN 1764591 [MXX/30861]
 Blank Lab ID: 1400791

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1174875001, 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009, 1174875010, 1174875011, 1174875012, 1174875013, 1174875014

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: MMS9876
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 7/28/2017 6:27:14PM

Prep Batch: MXX30861
 Prep Method: E200.2
 Prep Date/Time: 7/28/2017 7:15:17AM
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1174875 [MXX30861]
 Blank Spike Lab ID: 1400792
 Date Analyzed: 07/28/2017 18:30

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1174875001, 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009,
 1174875010, 1174875011, 1174875012, 1174875013, 1174875014

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	10400	104	(85-115)
Copper	1000	984	98	(85-115)
Magnesium	10000	10500	105	(85-115)

Batch Information

Analytical Batch: **MMS9876**
 Analytical Method: **EP200.8**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **VDL**

Prep Batch: **MXX30861**
 Prep Method: **E200.2**
 Prep Date/Time: **07/28/2017 07:15**
 Spike Init Wt./Vol.: 10000 ug/L Extract Vol: 50 mL
 Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1400793
 MS Sample ID: 1400794 MS
 MSD Sample ID:

Analysis Date: 07/28/2017 18:39
 Analysis Date: 07/28/2017 18:42
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1174875001, 1174875002, 1174875005

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	12800	10000	22600	98				70-130		
Copper	8.54	1000	986	98				70-130		
Magnesium	1710	10000	11800	101				70-130		

Batch Information

Analytical Batch: MMS9876
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 7/28/2017 6:42:15PM

Prep Batch: MXX30861
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 7/28/2017 7:15:17AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 08/29/2017 11:27:59AM

Matrix Spike Summary

Original Sample ID: 1400795
 MS Sample ID: 1400796 MS
 MSD Sample ID:

Analysis Date: 07/28/2017 19:18
 Analysis Date: 07/28/2017 19:21
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009, 1174875010, 1174875011, 1174875012, 1174875013, 1174875014

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	18900	10000	28900	100				70-130		
Copper	8.32	1000	981	97				70-130		
Magnesium	4290	10000	14500	102				70-130		

Batch Information

Analytical Batch: MMS9876
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 7/28/2017 7:21:22PM

Prep Batch: MXX30861
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 7/28/2017 7:15:17AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 08/29/2017 11:27:59AM

Method Blank

Blank ID: MB for HBN 1764643 [STS/5569]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1401043

QC for Samples:

1174875001, 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009, 1174875010, 1174875011, 1174875012, 1174875013, 1174875014

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: STS5569

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Analytical Date/Time: 7/27/2017 6:01:52PM

Print Date: 08/29/2017 11:28:00AM

Duplicate Sample Summary

Original Sample ID: 1174875013

Duplicate Sample ID: 1401046

QC for Samples:

1174875001, 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009, 1174875010, 1174875011, 1174875012, 1174875013, 1174875014

Analysis Date: 07/27/2017 18:01

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	6.73	7.55	mg/L	11.40*	(< 5)

Batch Information

Analytical Batch: STS5569

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Print Date: 08/29/2017 11:28:01AM

Duplicate Sample Summary

Original Sample ID: 1174894003

Duplicate Sample ID: 1401047

QC for Samples:

1174875014

Analysis Date: 07/27/2017 18:01

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	ND	1.28J	mg/L	0.00	(< 5)

Batch Information

Analytical Batch: STS5569

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Print Date: 08/29/2017 11:28:01AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1174875 [STS5569]
 Blank Spike Lab ID: 1401044
 Date Analyzed: 07/27/2017 18:01

Spike Duplicate ID: LCSD for HBN 1174875 [STS5569]
 Spike Duplicate Lab ID: 1401045
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1174875001, 1174875002, 1174875005, 1174875006, 1174875007, 1174875008, 1174875009, 1174875010, 1174875011, 1174875012, 1174875013, 1174875014

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	50	50.2	100	50	50.1	100	(75-125)	0.20	(< 5)

Batch Information

Analytical Batch: STS5569
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: AYC

Method Blank

Blank ID: MB for HBN 1764703 [VXX/30969]
 Blank Lab ID: 1401280

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1174875002, 1174875005, 1174875008, 1174875010, 1174875013, 1174875015

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Chlorobenzene	0.250U	0.500	0.150	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)	105	81-118		%
4-Bromofluorobenzene (surr)	103	85-114		%
Toluene-d8 (surr)	107	89-112		%

Batch Information

Analytical Batch: VMS16996
 Analytical Method: EPA 602/624
 Instrument: VSA Agilent GC/MS 7890B/5977A
 Analyst: FDR
 Analytical Date/Time: 7/27/2017 11:36:00AM

Prep Batch: VXX30969
 Prep Method: SW5030B
 Prep Date/Time: 7/27/2017 6:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1174875 [VXX30969]
 Blank Spike Lab ID: 1401281
 Date Analyzed: 07/27/2017 12:02

Spike Duplicate ID: LCSD for HBN 1174875
 [VXX30969]
 Spike Duplicate Lab ID: 1401282
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1174875002, 1174875005, 1174875008, 1174875010, 1174875013, 1174875015

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2-Dichlorobenzene	30	32.4	108	30	32.2	107	(80-119)	0.65	(< 20)
1,3-Dichlorobenzene	30	33.0	110	30	32.7	109	(80-119)	0.85	(< 20)
1,4-Dichlorobenzene	30	32.2	107	30	32.0	107	(79-118)	0.53	(< 20)
Benzene	30	31.1	104	30	31.4	105	(79-120)	0.74	(< 20)
Chlorobenzene	30	31.4	105	30	31.2	104	(82-118)	0.80	(< 20)
Ethylbenzene	30	33.4	111	30	33.0	110	(79-121)	1.30	(< 20)
o-Xylene	30	31.8	106	30	32.1	107	(78-122)	0.72	(< 20)
P & M -Xylene	60	70.3	117	60	70.5	118	(80-121)	0.27	(< 20)
Toluene	30	30.9	103	30	30.8	103	(80-121)	0.58	(< 20)

Surrogates

1,2-Dichloroethane-D4 (surr)	30	97.4	97	30	99	99	(81-118)	1.60
4-Bromofluorobenzene (surr)	30	89.3	89	30	90.3	90	(85-114)	1.20
Toluene-d8 (surr)	30	104	104	30	106	106	(89-112)	1.80

Batch Information

Analytical Batch: **VMS16996**
 Analytical Method: **EPA 602/624**
 Instrument: **VSA Agilent GC/MS 7890B/5977A**
 Analyst: **FDR**

Prep Batch: **VXX30969**
 Prep Method: **SW5030B**
 Prep Date/Time: **07/27/2017 06:00**
 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: 1174875002
 MS Sample ID: 1174875003 BMS
 MSD Sample ID: 1174875004 BMSD

Analysis Date: 07/27/2017 15:00
 Analysis Date: 07/27/2017 16:28
 Analysis Date: 07/27/2017 16:46
 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 (%)			
1,2-Dichlorobenzene	1.00U	30.0	32.9	110	30.0	33.2	111	80-119	1.00	(< 20)
1,3-Dichlorobenzene	1.00U	30.0	34.2	114	30.0	34.1	114	80-119	0.32	(< 20)
1,4-Dichlorobenzene	0.500U	30.0	33.5	112	30.0	33.0	110	79-118	1.30	(< 20)
Benzene	0.400U	30.0	31.6	105	30.0	32.5	108	79-120	2.70	(< 20)
Chlorobenzene	0.500U	30.0	32.5	108	30.0	32.3	108	82-118	0.62	(< 20)
Ethylbenzene	1.00U	30.0	35.1	117	30.0	35.0	117	79-121	0.40	(< 20)
o-Xylene	1.00U	30.0	33.7	112	30.0	34.1	114	78-122	1.30	(< 20)
P & M -Xylene	2.00U	60.0	75.6	126 *	60.0	75.4	126 *	80-121	0.28	(< 20)
Toluene	1.00U	30.0	33	110	30.0	32.7	109	80-121	0.88	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29	97	30.0	29.7	99	81-118	2.30	
4-Bromofluorobenzene (surr)		30.0	26.4	88	30.0	26.2	87	85-114	0.84	
Toluene-d8 (surr)		30.0	31.8	106	30.0	31.6	105	89-112	0.66	

Batch Information

Analytical Batch: VMS16996
 Analytical Method: EPA 602/624
 Instrument: VSA Agilent GC/MS 7890B/5977A
 Analyst: FDR
 Analytical Date/Time: 7/27/2017 4:28:00PM

Prep Batch: VXX30969
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 7/27/2017 6:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Method Blank

Blank ID: MB for HBN 1764585 [XXX/37990]
 Blank Lab ID: 1400774

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1174875002, 1174875005, 1174875008, 1174875010, 1174875013

Results by EPA 625M SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.00625U	0.0125	0.00370	ug/L
Acenaphthylene	0.00625U	0.0125	0.00370	ug/L
Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo(a)Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo[a]pyrene	0.00250U	0.00500	0.00150	ug/L
Benzo[b]Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Benzo[g,h,i]perylene	0.00625U	0.0125	0.00370	ug/L
Benzo[k]fluoranthene	0.00625U	0.0125	0.00370	ug/L
Chrysene	0.00625U	0.0125	0.00370	ug/L
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	ug/L
Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Fluorene	0.00625U	0.0125	0.00370	ug/L
Indeno[1,2,3-c,d] pyrene	0.00625U	0.0125	0.00370	ug/L
Naphthalene	0.0125U	0.0250	0.00780	ug/L
Phenanthrene	0.0250U	0.0500	0.00370	ug/L
Pyrene	0.0250U	0.0500	0.00370	ug/L
Surrogates				
2-Fluorobiphenyl (surr)	89.9	53-106		%
Terphenyl-d14 (surr)	93.1	58-132		%

Batch Information

Analytical Batch: XMS10266
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 8/1/2017 3:08:00PM

Prep Batch: XXX37990
 Prep Method: SW3520C
 Prep Date/Time: 7/27/2017 8:44:58AM
 Prep Initial Wt./Vol.: 1000 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1174875 [XXX37990]
 Blank Spike Lab ID: 1400775
 Date Analyzed: 08/01/2017 15:28

Spike Duplicate ID: LCSD for HBN 1174875
 [XXX37990]
 Spike Duplicate Lab ID: 1400776
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1174875002, 1174875005, 1174875008, 1174875010, 1174875013

Results by EPA 625M SIM (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.5	0.473	95	0.5	0.519	104	(48-114)	9.40	(< 20)
Acenaphthylene	0.5	0.395	79	0.5	0.420	84	(35-121)	6.20	(< 20)
Anthracene	0.5	0.397	79	0.5	0.418	84	(53-119)	5.20	(< 20)
Benzo(a)Anthracene	0.5	0.380	76	0.5	0.413	83	(59-120)	8.40	(< 20)
Benzo[a]pyrene	0.5	0.356	71	0.5	0.397	79	(53-120)	10.70	(< 20)
Benzo[b]Fluoranthene	0.5	0.377	75	0.5	0.420	84	(53-126)	10.80	(< 20)
Benzo[g,h,i]perylene	0.5	0.338	68	0.5	0.389	78	(44-128)	14.20	(< 20)
Benzo[k]fluoranthene	0.5	0.383	77	0.5	0.412	82	(54-125)	7.30	(< 20)
Chrysene	0.5	0.401	80	0.5	0.441	88	(57-120)	9.40	(< 20)
Dibenzo[a,h]anthracene	0.5	0.308	62	0.5	0.367	73	(44-131)	17.40	(< 20)
Fluoranthene	0.5	0.397	79	0.5	0.425	85	(58-120)	6.70	(< 20)
Fluorene	0.5	0.389	78	0.5	0.420	84	(50-118)	7.70	(< 20)
Indeno[1,2,3-c,d] pyrene	0.5	0.335	67	0.5	0.385	77	(48-130)	13.80	(< 20)
Naphthalene	0.5	0.385	77	0.5	0.415	83	(43-114)	7.50	(< 20)
Phenanthrene	0.5	0.377	76	0.5	0.409	82	(53-115)	8.00	(< 20)
Pyrene	0.5	0.416	83	0.5	0.446	89	(53-121)	7.00	(< 20)
Surrogates									
2-Fluorobiphenyl (surr)	0.5	82.2	82	0.5	90.6	91	(53-106)	9.70	
Terphenyl-d14 (surr)	0.5	85.1	85	0.5	90.4	90	(58-132)	6.00	

Batch Information

Analytical Batch: XMS10266
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD

Prep Batch: XXX37990
 Prep Method: SW3520C
 Prep Date/Time: 07/27/2017 08:44
 Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL

Billable Matrix Spike Summary

Original Sample ID: 1174875002
 MS Sample ID: 1174875003 BMS
 MSD Sample ID: 1174875004 BMSD

Analysis Date: 08/02/2017 1:49
 Analysis Date: 08/02/2017 2:10
 Analysis Date: 08/02/2017 2:30
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH)

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0128U	0.515	.489	95	0.521	0.381	73	48-114	24.60	* (< 20)
Acenaphthylene	0.0128U	0.515	.424	82	0.521	0.342	66	35-121	21.50	* (< 20)
Anthracene	0.0128U	0.515	.342	66	0.521	0.262	50	* 53-119	26.50	* (< 20)
Benzo(a)Anthracene	0.0128U	0.515	.221	43	* 0.521	0.118	23	* 59-120	60.50	* (< 20)
Benzo[a]pyrene	0.00510U	0.515	.166	32	* 0.521	0.0773	15	* 53-120	73.20	* (< 20)
Benzo[b]Fluoranthene	0.0162	0.515	.198	35	* 0.521	0.0937	15	* 53-126	71.60	* (< 20)
Benzo[g,h,i]perylene	0.0167	0.515	.135	23	* 0.521	0.0601	8	* 44-128	76.90	* (< 20)
Benzo[k]fluoranthene	0.0128U	0.515	.178	35	* 0.521	0.0809	16	* 54-125	74.80	* (< 20)
Chrysene	0.0128U	0.515	.287	56	* 0.521	0.156	30	* 57-120	59.40	* (< 20)
Dibenzo[a,h]anthracene	0.00510U	0.515	.118	23	* 0.521	0.0524	10	* 44-131	76.60	* (< 20)
Fluoranthene	0.0371	0.515	.359	62	0.521	0.234	38	* 58-120	42.10	* (< 20)
Fluorene	0.0128U	0.515	.4	78	0.521	0.321	62	50-118	21.90	* (< 20)
Indeno[1,2,3-c,d] pyrene	0.0128U	0.515	.117	23	* 0.521	0.0527	10	* 48-130	75.50	* (< 20)
Naphthalene	0.0255U	0.515	.426	83	0.521	0.344	66	43-114	21.30	* (< 20)
Phenanthrene	0.0510U	0.515	.393	76	0.521	0.298	57	53-115	27.40	* (< 20)
Pyrene	0.0521	0.515	.391	66	0.521	0.252	38	* 53-121	43.30	* (< 20)
Surrogates										
2-Fluorobiphenyl (surr)		0.515	.421	82	0.521	0.334	64	53-106	23.20	
Terphenyl-d14 (surr)		0.515	.253	49	* 0.521	0.144	28	* 58-132	55.00	

Batch Information

Analytical Batch: XMS10269
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 8/2/2017 2:10:00AM

Prep Batch: XXX37990
 Prep Method: Liquid/Liquid Extraction for 625 SIMS
 Prep Date/Time: 7/27/2017 8:44:58AM
 Prep Initial Wt./Vol.: 970.00mL
 Prep Extract Vol: 1.00mL

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofberger@kl.ci.anchorage.ak.us (907) 343-8058	1174875 

Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078
Complete by: 2 weeks

Note: Samples contain sodium thiosulfate for dechlorination

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-01	348-1	7/26/17	0915	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	① A	
SWM12-01			1036	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	② A F	Hand
SWM12-01 Dup			1030	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	③ ⑤ F	Hand
SWM03-01	1224-1		1105	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	④ ⑥ A	
SWM04-01	1224-2		1110	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑦ A	
SWM05-01	207-1		1135	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑧ F	
SWM06-01	314-22		1265	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑨ A	
SWM07-01	484-1		1240	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑩ F	
SWM08-01	86-1		1300	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑪ A	
SWM08-01 Dup	86-1		1300	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑫ A	
SWM09-01	499-1		1410	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑬ F	
SWM10-01	525-2		1346	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑭ A	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLL. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By: <i>Jeanette M. Sanni</i>	Transporter: hand	Received By: Anne O'Leary
Relinquished By:	Date/Time: 7/26/2017 1513	Date/Time: TB 10.14.17
Relinquished By:	Date/Time:	Date/Time: 7/20/17 1513 CS: Absent Hand del.

09/17/17



Chain of Custody Record

To: SGS Environmental Services, Inc.
 2100 West Potter Drive
 Anchorage, AK 99518
 (907) 562-2343
 (907) 561-5301 Fax
 Contact: Forest Taylor

SGS Quote No. 337618
Bill To: Municipality of Anchorage
 Attn: Kristy Bischofberger
 bischofbergerKL.ci.anchorage.ak.us
 (907) 343-8058

From: Kinnetic Laboratories, Inc
 704 West 2nd Avenue
 Anchorage, AK 99501
 (907) 276-6178
 (907) 278-6881 Fax
 Contact: Mark Savoie

1174875



Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-01	348-1	7/26/17	0915	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	① B-C	
SWM12-01			1030	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	② G-H	
SWM12-01 Dup			1030	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑤ G-H	
SWM03-01	1224-1		1105	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	④ B-C	
SWM04-01	1224-2		1110	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑦ B-C	
SWM05-01	207-1		1135	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑧ G-H	
SWM06-01	314-22		1205	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑨ B-C	
SWM07-01	484-1		1240	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑩ G-H	
SWM08-01	86-1		1300	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑪ B-C	
SWM08-01 Dup	86-1		1300	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑫ B-C	
SWM09-01	499-1		1410	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑬ G-H	
SWM10-01	525-2	↓	1346	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑭ B-C	

Project: MOA Stormwater Management
Matrix: Water
Project #: 5078

Complete by: 2 weeks

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments: Dissolved Copper must be Filtered & Preserved at Lab

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
Jamie M. Savie	7/26/17 1513	HAND	TRB 10-1 #021	
Relinquished By:		Transporter	Jamie Savie	7/26/17 1513

CS: ADSENT H.D.

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofberger@kll.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1174875



Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-01	348-1	7/26/17	0915	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	① D	
SWM12-01			1030	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	② HI	
SWM12-01 Dup			1030	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑤ HI	
SWM03-01	1224-1		1105	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑥ RD	
SWM04-01	1224-2		1110	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑦ RD	
SWM05-01	207-1		1135	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑧ HI	
SWM06-01	314-22		1205	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑨ LD	
SWM07-01	484-1		1240	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑩ HI	
SWM08-01	86-1		1300	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑪ LD	
SWM08-01 Dup	86-1		1300	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑫ LD	
SWM09-01	499-1		1410	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑬ HI	
SWM10-01	525-2		1346	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑭ LD	

Project #: 5078
Matrix: Water

Project: MOA Stormwater Management
Complete by: 2 weeks

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLL. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By: <i>Janeen Savie</i>	Date/Time: 7/26/17 1513	Transporter: HAND	Received By: TR 10-1 AD21	Date/Time: 7/20/17 15:13
Relinquished By:	Date/Time:	Transporter:	Received By: <i>Jane Savie</i>	Date/Time: 7/20/17 15:13

CS: Absent HD

Chain of Custody Record

To:
 SGS Environmental Services, Inc.
 2100 West Potter Drive
 Anchorage, AK 99518
 (907) 562-2343
 (907) 561-5301 Fax
 Contact: Forest Taylor

SGS Quote No. 337618
Bill To:
 Municipality of Anchorage
 Attn: Kristy Bischofberger
 bischofbergerKL.ci.anchorage.ak.us
 (907) 343-8058

From:
 Kinnetic Laboratories, Inc
 704 West 2nd Avenue
 Anchorage, AK 99501
 (907) 276-6178
 (907) 278-6881 Fax
 Contact: Mark Savoie

1174875



Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078

Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-01	348-1	7/26/17	0915	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	① DE	
SWM12-01			1030	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	② FJ	
SWM12-01 Dup			1030	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑤ IJ	
SWM03-01	1224-1		1105	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	④ DE	
SWM04-01	1224-2		1110	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑦ DE	
SWM05-01	207-1		1135	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑧ IJ	
SWM06-01	314-22		1205	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑨ DE	
SWM07-01	484-1		1240	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑩ IJ	
SWM08-01	86-1		1300	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑪ DE	
SWM08-01 Dup	86-1		1300	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑫ DE	
SWM09-01	499-1		1410	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑬ IJ	
SWM10-01	525-2		1346	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	⑭ DE	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLL. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

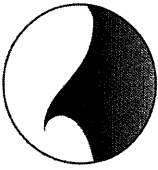
Special Instructions/Comments:

Sampled and Relinquished By: <i>Jameth Savie</i>	Transporter: HAND	Received By: TB 10.1 #021	Date/Time:
Relinquished By:	Transporter:	Received By: <i>Kathleen Collier</i>	Date/Time: 7/20/17 15:13

HO CS: Absent

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1174875

Project: MOA Stormwater Management **Project #: 5078**
Matrix: Water
Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM12-01		7/26/17	0945 1030	Samp/MS/MSD	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	6	②③④ A-B	
SWM12-01 Dup			1030	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑤ A-B	
SWM05-01	207-1		1135	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑧ A-B	
SWM07-01	484-1		1240	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑩ A-B	
SWM09-01	499-1		1410	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑬ A-B	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By: <i>Janet M. Savoie</i>	Transporter: HAND	Received By: TB 10.1 #021
Relinquished By:	Transporter:	Received By: <i>Janina Collins</i>
Date/Time:	Date/Time: 7/26/17 1513	Date/Time: 7/26/17 15:13
		Date/Time: 7/26/17 15:13

H10 08: Absent

Chain of Custody Record



1174875

To: SGS Environmental Services, Inc.
2100 West Potter Drive
Anchorage, AK 99518
(907) 562-2343
(907) 561-5301 Fax
Contact: Forest Taylor

SGS Quote No. 337618
Bill To: Municipality of Anchorage
Attn: Kristy Bischofberger
bischofbergerKL.ci.anchorage.ak.us
(907) 343-8058

From: Kinnetic Laboratories, Inc.
704 West 2nd Avenue
Anchorage, AK 99501
(907) 276-6178
(907) 278-6881 Fax
Contact: Mark Savoie

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM12-01		7/24/12	1030	Samp/MS/MSD	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	9	234 C-E	
SWM12-01 Dup			1030	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	5 C-E	
SWM05-01	207-1		1135	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	8 C-E	
SWM07-01	484-1		1240	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	10 C-E	
SWM09-01	499-1		1410	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	13 C-E	
Trip Blank	N/A	N/A	N/A	TB	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	15 A-C	

Project: MOA Stormwater Management **Matrix:** Water **Project #: 5078**

Complete by: 2 weeks

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
Forest Taylor	7/26/12 1513	HAND	chilled	
Mark Savoie		Transporter	June Collier	7/26/12 15:13
Relinquished By:			TS. Absent Hand del.	



e-Sample Receipt Form

SGS Workorder #:

1174875



1 1 7 4 8 7 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	
<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 type="checkbox"/> No	Cooler ID: 1 @ 10.1 °C Therm. ID: D21
	<input type="checkbox"/> N/A	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/> N/A	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/> N/A	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/> N/A	Cooler ID: @ °C Therm. ID:
*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	
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
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.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	<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>
1174875001-A	Na2S2O3 for Chlorine Redu	OK	1174875007-C	HNO3 to pH < 2	OK
1174875001-B	No Preservative Required	OK	1174875007-D	No Preservative Required	OK
1174875001-C	HNO3 to pH < 2	OK	1174875007-E	No Preservative Required	OK
1174875001-D	No Preservative Required	OK	1174875008-A	No Preservative Required	OK
1174875001-E	No Preservative Required	OK	1174875008-B	No Preservative Required	OK
1174875002-A	No Preservative Required	OK	1174875008-C	HCL to pH < 2	OK
1174875002-B	No Preservative Required	OK	1174875008-D	HCL to pH < 2	OK
1174875002-C	HCL to pH < 2	OK	1174875008-E	HCL to pH < 2	OK
1174875002-D	HCL to pH < 2	OK	1174875008-F	Na2S2O3 for Chlorine Redu	OK
1174875002-E	HCL to pH < 2	OK	1174875008-G	No Preservative Required	OK
1174875002-F	Na2S2O3 for Chlorine Redu	OK	1174875008-H	HNO3 to pH < 2	OK
1174875002-G	No Preservative Required	OK	1174875008-I	No Preservative Required	OK
1174875002-H	HNO3 to pH < 2	OK	1174875008-J	No Preservative Required	OK
1174875002-I	No Preservative Required	OK	1174875009-A	Na2S2O3 for Chlorine Redu	OK
1174875002-J	No Preservative Required	OK	1174875009-B	No Preservative Required	OK
1174875003-A	No Preservative Required	OK	1174875009-C	HNO3 to pH < 2	OK
1174875003-B	No Preservative Required	OK	1174875009-D	No Preservative Required	OK
1174875003-C	HCL to pH < 2	OK	1174875009-E	No Preservative Required	OK
1174875003-D	HCL to pH < 2	OK	1174875010-A	No Preservative Required	OK
1174875003-E	HCL to pH < 2	OK	1174875010-B	No Preservative Required	OK
1174875004-A	No Preservative Required	OK	1174875010-C	HCL to pH < 2	OK
1174875004-B	No Preservative Required	OK	1174875010-D	HCL to pH < 2	OK
1174875004-C	HCL to pH < 2	OK	1174875010-E	HCL to pH < 2	OK
1174875004-D	HCL to pH < 2	OK	1174875010-F	Na2S2O3 for Chlorine Redu	OK
1174875004-E	HCL to pH < 2	OK	1174875010-G	No Preservative Required	OK
1174875005-A	No Preservative Required	OK	1174875010-H	HNO3 to pH < 2	OK
1174875005-B	No Preservative Required	OK	1174875010-I	No Preservative Required	OK
1174875005-C	HCL to pH < 2	OK	1174875010-J	No Preservative Required	OK
1174875005-D	HCL to pH < 2	OK	1174875011-A	Na2S2O3 for Chlorine Redu	OK
1174875005-E	HCL to pH < 2	OK	1174875011-B	No Preservative Required	OK
1174875005-F	Na2S2O3 for Chlorine Redu	OK	1174875011-C	HNO3 to pH < 2	OK
1174875005-G	No Preservative Required	OK	1174875011-D	No Preservative Required	OK
1174875005-H	HNO3 to pH < 2	OK	1174875011-E	No Preservative Required	OK
1174875005-I	No Preservative Required	OK	1174875012-A	Na2S2O3 for Chlorine Redu	OK
1174875005-J	No Preservative Required	OK	1174875012-B	No Preservative Required	OK
1174875006-A	Na2S2O3 for Chlorine Redu	OK	1174875012-C	HNO3 to pH < 2	OK
1174875006-B	No Preservative Required	OK	1174875012-D	No Preservative Required	OK
1174875006-C	HNO3 to pH < 2	OK	1174875012-E	No Preservative Required	OK
1174875006-D	No Preservative Required	OK	1174875013-A	No Preservative Required	OK
1174875006-E	No Preservative Required	OK	1174875013-B	No Preservative Required	OK
1174875007-A	Na2S2O3 for Chlorine Redu	OK	1174875013-C	HCL to pH < 2	OK
1174875007-B	No Preservative Required	OK	1174875013-D	HCL to pH < 2	OK

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1174875013-E	HCL to pH < 2	OK			
1174875013-F	Na2S2O3 for Chlorine Redu	OK			
1174875013-G	No Preservative Required	OK			
1174875013-H	HNO3 to pH < 2	OK			
1174875013-I	No Preservative Required	OK			
1174875013-J	No Preservative Required	OK			
1174875014-A	Na2S2O3 for Chlorine Redu	OK			
1174875014-B	No Preservative Required	OK			
1174875014-C	HNO3 to pH < 2	OK			
1174875014-D	No Preservative Required	OK			
1174875014-E	No Preservative Required	OK			
1174875015-A	HCL to pH < 2	OK			
1174875015-B	HCL to pH < 2	OK			
1174875015-C	HCL 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.

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.

Appendix B2

Laboratory Data Package Storm Event #2



Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr
PO Box 196650
Anchorage, AK 99519
907-343-8058

Report Number: **1175729**

Client Project: **MOA Stormwater Management 5078**

Dear Kristi Bischofberger,

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 Forest 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.

Forest Taylor
Project Manager
Forest.Taylor@sgs.com

Date

Print Date: 09/06/2017 1:52:16PM

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

Case Narrative

SGS Client: **MOA-Project Mnmt/Engr**
SGS Project: **1175729**
Project Name/Site: **MOA Stormwater Management 5078**
Project Contact: **Kristi Bischofberger**

Refer to sample receipt form for information on sample condition.

SWM12-02 MS (1175729013) BMS

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

SWM12-02 MSD (1175729014) BMSD

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

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

1175674001DUP (1406247) 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.

1175682001DUP (1406248) 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.

1175729009MS (1406303) MS

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

1175729009MSD (1406304) MSD

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

8270D SIM - PAH MS/MSD RPD for several analytes does 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.

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)				
1175729006	SWM09-02	XMS10351	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: 09/06/2017 1:52:23PM

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). 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
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>
SWM05-02	1175729001	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM06-02	1175729002	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM07-02	1175729003	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM08-02	1175729004	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM08-02 DUP	1175729005	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM09-02	1175729006	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM10-02	1175729007	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM11-02	1175729008	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM12-02	1175729009	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM12-02 DUP	1175729010	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM03-02	1175729011	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM04-02	1175729012	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM12-02 MS	1175729013	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM12-02 MSD	1175729014	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
Trip Blank	1175729015	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM11-02	1175729016	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM12-02	1175729017	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM12-02 DUP	1175729018	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM03-02	1175729019	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM04-02	1175729020	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM05-02	1175729021	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM06-02	1175729022	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM07-02	1175729023	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM08-02	1175729024	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM08-02 DUP	1175729025	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM09-02	1175729026	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)
SWM10-02	1175729027	08/16/2017	08/16/2017	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
EPA 602/624	602 Aromatics by 624 (W)
EPA 625M SIM (PAH)	625 Semi-Volatiles GC/MS Liq/Liq ext.
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

Detectable Results Summary

Client Sample ID: **SWM05-02**

Lab Sample ID: 1175729001

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	8.23	ug/L
Biochemical Oxygen Demand	2.05	mg/L
Fecal Coliform	864	col/100mL

Polynuclear Aromatics GC/MS

Chrysene	0.0247	ug/L
Fluoranthene	0.0286	ug/L
Total Suspended Solids	33.0	mg/L

Waters Department

Client Sample ID: **SWM06-02**

Lab Sample ID: 1175729002

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.44	ug/L
Fecal Coliform	500	col/100mL
Total Suspended Solids	15.3	mg/L

Waters Department

Client Sample ID: **SWM07-02**

Lab Sample ID: 1175729003

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	10.6	ug/L
Biochemical Oxygen Demand	8.94	mg/L
Fecal Coliform	10000	col/100mL
Chrysene	0.110	ug/L
Fluoranthene	0.113	ug/L
Total Suspended Solids	179	mg/L

Polynuclear Aromatics GC/MS

Waters Department

Client Sample ID: **SWM08-02**

Lab Sample ID: 1175729004

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	4.60	ug/L
Biochemical Oxygen Demand	4.97	mg/L
Fecal Coliform	11600	col/100mL
Total Suspended Solids	96.5	mg/L

Waters Department

Client Sample ID: **SWM08-02 DUP**

Lab Sample ID: 1175729005

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	4.96	ug/L
Biochemical Oxygen Demand	4.89	mg/L
Fecal Coliform	11700	col/100mL
Total Suspended Solids	96.0	mg/L

Waters Department

Detectable Results Summary

Client Sample ID: **SWM09-02**

Lab Sample ID: 1175729006

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.12	ug/L
Biochemical Oxygen Demand	2.98	mg/L
Fecal Coliform	20000	col/100mL
Benzo(a)Anthracene	0.0328	ug/L
Benzo[a]pyrene	0.0374	ug/L
Benzo[b]Fluoranthene	0.0782	ug/L
Benzo[g,h,i]perylene	0.0448	ug/L
Benzo[k]fluoranthene	0.0261	ug/L
Chrysene	0.0752	ug/L
Fluoranthene	0.127	ug/L
Indeno[1,2,3-c,d] pyrene	0.0351	ug/L
Pyrene	0.0939	ug/L
Total Suspended Solids	26.5	mg/L

Polynuclear Aromatics GC/MS

Waters Department

Client Sample ID: **SWM10-02**

Lab Sample ID: 1175729007

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	1.44	ug/L
Biochemical Oxygen Demand	2.09	mg/L
Fecal Coliform	793	col/100mL
Total Suspended Solids	137	mg/L

Waters Department

Client Sample ID: **SWM11-02**

Lab Sample ID: 1175729008

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	3.18	ug/L
Biochemical Oxygen Demand	2.18	mg/L
Fecal Coliform	7820	col/100mL
Total Suspended Solids	9.90	mg/L

Waters Department

Client Sample ID: **SWM12-02**

Lab Sample ID: 1175729009

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	6.53	ug/L
Biochemical Oxygen Demand	4.98	mg/L
Fecal Coliform	5100	col/100mL
Benzo[g,h,i]perylene	0.0206	ug/L
Chrysene	0.0364	ug/L
Fluoranthene	0.0503	ug/L
Pyrene	0.0645	ug/L
Total Suspended Solids	65.0	mg/L

Polynuclear Aromatics GC/MS

Waters Department

Detectable Results Summary

Client Sample ID: **SWM12-02 DUP**

Lab Sample ID: 1175729010

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

Polynuclear Aromatics GC/MS

Waters Department

Client Sample ID: **SWM03-02**

Lab Sample ID: 1175729011

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

Waters Department

Client Sample ID: **SWM04-02**

Lab Sample ID: 1175729012

**Dissolved Metals by ICP/MS
Microbiology Laboratory**

Waters Department

Client Sample ID: **SWM11-02**

Lab Sample ID: 1175729016

Metals by ICP/MS

Client Sample ID: **SWM12-02**

Lab Sample ID: 1175729017

Metals by ICP/MS

Client Sample ID: **SWM12-02 DUP**

Lab Sample ID: 1175729018

Metals by ICP/MS

Client Sample ID: **SWM03-02**

Lab Sample ID: 1175729019

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	7.10	ug/L
Biochemical Oxygen Demand	4.99	mg/L
Fecal Coliform	6940	col/100mL
Benzo[g,h,i]perylene	0.0213	ug/L
Chrysene	0.0385	ug/L
Fluoranthene	0.0480	ug/L
Pyrene	0.0632	ug/L
Total Suspended Solids	68.0	mg/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.67	ug/L
Fecal Coliform	845	col/100mL
Total Suspended Solids	9.68	mg/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.63	ug/L
Fecal Coliform	482	col/100mL
Total Suspended Solids	4.62	mg/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	12000	ug/L
Hardness as CaCO ₃	37.4	mg/L
Magnesium	1840	ug/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	20800	ug/L
Hardness as CaCO ₃	73.8	mg/L
Magnesium	5330	ug/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	21000	ug/L
Hardness as CaCO ₃	76.2	mg/L
Magnesium	5750	ug/L

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	16100	ug/L
Hardness as CaCO ₃	62.8	mg/L
Magnesium	5470	ug/L

Detectable Results Summary

Client Sample ID: **SWM04-02**

Lab Sample ID: 1175729020

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	25700	ug/L
Hardness as CaCO3	89.6	mg/L
Magnesium	6200	ug/L

Client Sample ID: **SWM05-02**

Lab Sample ID: 1175729021

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	9330	ug/L
Hardness as CaCO3	34.0	mg/L
Magnesium	2590	ug/L

Client Sample ID: **SWM06-02**

Lab Sample ID: 1175729022

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	3150	ug/L
Hardness as CaCO3	11.0	mg/L
Magnesium	767	ug/L

Client Sample ID: **SWM07-02**

Lab Sample ID: 1175729023

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	8420	ug/L
Hardness as CaCO3	36.1	mg/L
Magnesium	3650	ug/L

Client Sample ID: **SWM08-02**

Lab Sample ID: 1175729024

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	5410	ug/L
Hardness as CaCO3	21.4	mg/L
Magnesium	1920	ug/L

Client Sample ID: **SWM08-02 DUP**

Lab Sample ID: 1175729025

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	5610	ug/L
Hardness as CaCO3	21.8	mg/L
Magnesium	1900	ug/L

Client Sample ID: **SWM09-02**

Lab Sample ID: 1175729026

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	18400	ug/L
Hardness as CaCO3	64.2	mg/L
Magnesium	4450	ug/L

Client Sample ID: **SWM10-02**

Lab Sample ID: 1175729027

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	21000	ug/L
Hardness as CaCO3	73.5	mg/L
Magnesium	5090	ug/L

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Results of **SWM05-02**

Client Sample ID: **SWM05-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729001
Lab Project ID: 1175729

Collection Date: 08/16/17 14:52
Received Date: 08/16/17 17:45
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	8.23	1.00	0.310	ug/L	1		09/02/17 22:36

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 22:36
Container ID: 1175729001-C

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM05-02**

Client Sample ID: **SWM05-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729001
Lab Project ID: 1175729

Collection Date: 08/16/17 14:52
Received Date: 08/16/17 17:45
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	2.05	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729001-D

<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	864	9.09	9.09	col/100mL	1		08/16/17 18:04

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 18:04
Container ID: 1175729001-A

Print Date: 09/06/2017 1:52:29PM



Results of **SWM05-02**

Client Sample ID: **SWM05-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729001
Lab Project ID: 1175729

Collection Date: 08/16/17 14:52
Received Date: 08/16/17 17:45
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	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Acenaphthylene	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Anthracene	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Benzo(a)Anthracene	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Benzo[a]pyrene	0.00552 U	0.00552	0.00166	ug/L	1		08/28/17 01:12
Benzo[b]Fluoranthene	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Benzo[g,h,i]perylene	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Benzo[k]fluoranthene	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Chrysene	0.0247	0.0138	0.00409	ug/L	1		08/28/17 01:12
Dibenzo[a,h]anthracene	0.00552 U	0.00552	0.00166	ug/L	1		08/28/17 01:12
Fluoranthene	0.0286	0.0138	0.00409	ug/L	1		08/28/17 01:12
Fluorene	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Indeno[1,2,3-c,d] pyrene	0.0138 U	0.0138	0.00409	ug/L	1		08/28/17 01:12
Naphthalene	0.0276 U	0.0276	0.00862	ug/L	1		08/28/17 01:12
Phenanthrene	0.0552 U	0.0552	0.00409	ug/L	1		08/28/17 01:12
Pyrene	0.0552 U	0.0552	0.00409	ug/L	1		08/28/17 01:12
Surrogates							
2-Methylnaphthalene-d10 (surr)	77.2	47-106		%	1		08/28/17 01:12
Fluoranthene-d10 (surr)	61.9	24-116		%	1		08/28/17 01:12

Batch Information

Analytical Batch: XMS10351
Analytical Method: EPA 625M SIM (PAH)
Analyst: NRB
Analytical Date/Time: 08/28/17 01:12
Container ID: 1175729001-I

Prep Batch: XXX38188
Prep Method: SW3520C
Prep Date/Time: 08/18/17 08:43
Prep Initial Wt./Vol.: 905 mL
Prep Extract Vol: 1 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM05-02**

Client Sample ID: **SWM05-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729001
Lab Project ID: 1175729

Collection Date: 08/16/17 14:52
Received Date: 08/16/17 17:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:36
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:36
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 18:36
Benzene	0.400 U	0.400	0.120	ug/L	1		08/30/17 18:36
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 18:36
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:36
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:36
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/30/17 18:36
Toluene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:36
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.8	81-118		%	1		08/30/17 18:36
4-Bromofluorobenzene (surr)	102	85-114		%	1		08/30/17 18:36
Toluene-d8 (surr)	102	89-112		%	1		08/30/17 18:36

Batch Information

Analytical Batch: VMS17120
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/30/17 18:36
Container ID: 1175729001-F

Prep Batch: VXX31191
Prep Method: SW5030B
Prep Date/Time: 08/30/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of **SWM05-02**

Client Sample ID: **SWM05-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729001
Lab Project ID: 1175729

Collection Date: 08/16/17 14:52
Received Date: 08/16/17 17:45
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	33.0	5.00	1.55	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729001-E

Print Date: 09/06/2017 1:52:29PM



Results of SWM06-02

Client Sample ID: **SWM06-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729002
Lab Project ID: 1175729

Collection Date: 08/16/17 14:02
Received Date: 08/16/17 17:45
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	2.44	1.00	0.310	ug/L	1		09/02/17 22:39

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 22:39
Container ID: 1175729002-C

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM06-02**

Client Sample ID: **SWM06-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729002
Lab Project ID: 1175729

Collection Date: 08/16/17 14:02
Received Date: 08/16/17 17:45
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		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729002-D

<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	500	10.0	10.0	col/100mL	1		08/16/17 18:04

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 18:04
Container ID: 1175729002-A

Print Date: 09/06/2017 1:52:29PM



Results of **SWM06-02**

Client Sample ID: **SWM06-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729002
Lab Project ID: 1175729

Collection Date: 08/16/17 14:02
Received Date: 08/16/17 17:45
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	15.3	1.16	0.360	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729002-E

Print Date: 09/06/2017 1:52:29PM



Results of **SWM07-02**

Client Sample ID: **SWM07-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729003
Lab Project ID: 1175729

Collection Date: 08/16/17 13:37
Received Date: 08/16/17 17:45
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	10.6	1.00	0.310	ug/L	1		09/02/17 22:42

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 22:42
Container ID: 1175729003-C

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM07-02**

Client Sample ID: **SWM07-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729003
Lab Project ID: 1175729

Collection Date: 08/16/17 13:37
Received Date: 08/16/17 17:45
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	8.94	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729003-D

<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	10000	90.1	90.1	col/100mL	1		08/16/17 18:04

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 18:04
Container ID: 1175729003-A

Print Date: 09/06/2017 1:52:29PM



Results of **SWM07-02**

Client Sample ID: **SWM07-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729003
Lab Project ID: 1175729

Collection Date: 08/16/17 13:37
Received Date: 08/16/17 17:45
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	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Acenaphthylene	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Anthracene	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Benzo(a)Anthracene	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Benzo[a]pyrene	0.0265 U	0.0265	0.00794	ug/L	5		08/28/17 01:32
Benzo[b]Fluoranthene	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Benzo[g,h,i]perylene	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Benzo[k]fluoranthene	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Chrysene	0.110	0.0661	0.0196	ug/L	5		08/28/17 01:32
Dibenzo[a,h]anthracene	0.0265 U	0.0265	0.00794	ug/L	5		08/28/17 01:32
Fluoranthene	0.113	0.0661	0.0196	ug/L	5		08/28/17 01:32
Fluorene	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Indeno[1,2,3-c,d] pyrene	0.0661 U	0.0661	0.0196	ug/L	5		08/28/17 01:32
Naphthalene	0.132 U	0.132	0.0413	ug/L	5		08/28/17 01:32
Phenanthrene	0.265 U	0.265	0.0196	ug/L	5		08/28/17 01:32
Pyrene	0.265 U	0.265	0.0196	ug/L	5		08/28/17 01:32
Surrogates							
2-Methylnaphthalene-d10 (surr)	67.3	47-106		%	5		08/28/17 01:32
Fluoranthene-d10 (surr)	44.8	24-116		%	5		08/28/17 01:32

Batch Information

Analytical Batch: XMS10351
Analytical Method: EPA 625M SIM (PAH)
Analyst: NRB
Analytical Date/Time: 08/28/17 01:32
Container ID: 1175729003-I

Prep Batch: XXX38188
Prep Method: SW3520C
Prep Date/Time: 08/18/17 08:43
Prep Initial Wt./Vol.: 945 mL
Prep Extract Vol: 1 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM07-02**

Client Sample ID: **SWM07-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729003
Lab Project ID: 1175729

Collection Date: 08/16/17 13:37
Received Date: 08/16/17 17:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:54
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:54
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 18:54
Benzene	0.400 U	0.400	0.120	ug/L	1		08/30/17 18:54
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 18:54
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:54
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:54
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/30/17 18:54
Toluene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:54
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.6	81-118		%	1		08/30/17 18:54
4-Bromofluorobenzene (surr)	100	85-114		%	1		08/30/17 18:54
Toluene-d8 (surr)	103	89-112		%	1		08/30/17 18:54

Batch Information

Analytical Batch: VMS17120
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/30/17 18:54
Container ID: 1175729003-F

Prep Batch: VXX31191
Prep Method: SW5030B
Prep Date/Time: 08/30/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of **SWM07-02**

Client Sample ID: **SWM07-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729003
Lab Project ID: 1175729

Collection Date: 08/16/17 13:37
Received Date: 08/16/17 17:45
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	179	10.0	3.10	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729003-E

Print Date: 09/06/2017 1:52:29PM



Results of SWM08-02

Client Sample ID: **SWM08-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729004
Lab Project ID: 1175729

Collection Date: 08/16/17 13:22
Received Date: 08/16/17 17:45
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	4.60	1.00	0.310	ug/L	1		09/02/17 22:51

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 22:51
Container ID: 1175729004-C

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM08-02**

Client Sample ID: **SWM08-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729004
Lab Project ID: 1175729

Collection Date: 08/16/17 13:22
Received Date: 08/16/17 17:45
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	4.97	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729004-D

<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	11600	90.1	90.1	col/100mL	1		08/16/17 18:04

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 18:04
Container ID: 1175729004-A

Print Date: 09/06/2017 1:52:29PM



Results of SWM08-02

Client Sample ID: **SWM08-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729004
Lab Project ID: 1175729

Collection Date: 08/16/17 13:22
Received Date: 08/16/17 17:45
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	96.5	5.00	1.55	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729004-E

Print Date: 09/06/2017 1:52:29PM



Results of **SWM08-02 DUP**

Client Sample ID: **SWM08-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729005
Lab Project ID: 1175729

Collection Date: 08/16/17 13:22
Received Date: 08/16/17 17:45
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	4.96	1.00	0.310	ug/L	1		09/02/17 22:54

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 22:54
Container ID: 1175729005-C

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM08-02 DUP**

Client Sample ID: **SWM08-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729005
Lab Project ID: 1175729

Collection Date: 08/16/17 13:22
Received Date: 08/16/17 17:45
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	4.89	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729005-D

<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	11700	90.1	90.1	col/100mL	1		08/16/17 18:04

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 18:04
Container ID: 1175729005-A

Print Date: 09/06/2017 1:52:29PM



Results of SWM08-02 DUP

Client Sample ID: **SWM08-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729005
Lab Project ID: 1175729

Collection Date: 08/16/17 13:22
Received Date: 08/16/17 17:45
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	96.0	5.00	1.55	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729005-E

Print Date: 09/06/2017 1:52:29PM

Results of SWM09-02

Client Sample ID: **SWM09-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729006
 Lab Project ID: 1175729

Collection Date: 08/16/17 12:45
 Received Date: 08/16/17 17:45
 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	3.12	1.00	0.310	ug/L	1		09/02/17 22:57

Batch Information

Analytical Batch: MMS9923
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 09/02/17 22:57
 Container ID: 1175729006-C

Prep Batch: MXX30952
 Prep Method: E200.2
 Prep Date/Time: 08/21/17 09:00
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of **SWM09-02**

Client Sample ID: **SWM09-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729006
Lab Project ID: 1175729

Collection Date: 08/16/17 12:45
Received Date: 08/16/17 17:45
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	2.98	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729006-D

<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	20000	1000	1000	col/100mL	1		08/16/17 18:04

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 18:04
Container ID: 1175729006-A

Print Date: 09/06/2017 1:52:29PM



Results of **SWM09-02**

Client Sample ID: **SWM09-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729006
Lab Project ID: 1175729

Collection Date: 08/16/17 12:45
Received Date: 08/16/17 17:45
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	0.0131 U	0.0131	0.00387	ug/L	1		08/28/17 01:53
Acenaphthylene	0.0131 U	0.0131	0.00387	ug/L	1		08/28/17 01:53
Anthracene	0.0131 U	0.0131	0.00387	ug/L	1		08/28/17 01:53
Benzo(a)Anthracene	0.0328	0.0131	0.00387	ug/L	1		08/28/17 01:53
Benzo[a]pyrene	0.0374	0.00524	0.00157	ug/L	1		08/28/17 01:53
Benzo[b]Fluoranthene	0.0782	0.0131	0.00387	ug/L	1		08/28/17 01:53
Benzo[g,h,i]perylene	0.0448	0.0131	0.00387	ug/L	1		08/28/17 01:53
Benzo[k]fluoranthene	0.0261	0.0131	0.00387	ug/L	1		08/28/17 01:53
Chrysene	0.0752	0.0131	0.00387	ug/L	1		08/28/17 01:53
Dibenzo[a,h]anthracene	0.00524 U	0.00524	0.00157	ug/L	1		08/28/17 01:53
Fluoranthene	0.127	0.0131	0.00387	ug/L	1		08/28/17 01:53
Fluorene	0.0131 U	0.0131	0.00387	ug/L	1		08/28/17 01:53
Indeno[1,2,3-c,d] pyrene	0.0351	0.0131	0.00387	ug/L	1		08/28/17 01:53
Naphthalene	0.0262 U	0.0262	0.00817	ug/L	1		08/28/17 01:53
Phenanthrene	0.0524 U	0.0524	0.00387	ug/L	1		08/28/17 01:53
Pyrene	0.0939	0.0524	0.00387	ug/L	1		08/28/17 01:53
Surrogates							
2-Methylnaphthalene-d10 (surr)	53.8	47-106		%	1		08/28/17 01:53
Fluoranthene-d10 (surr)	42.4	24-116		%	1		08/28/17 01:53

Batch Information

Analytical Batch: XMS10351
Analytical Method: EPA 625M SIM (PAH)
Analyst: NRB
Analytical Date/Time: 08/28/17 01:53
Container ID: 1175729006-I

Prep Batch: XXX38188
Prep Method: SW3520C
Prep Date/Time: 08/18/17 08:43
Prep Initial Wt./Vol.: 955 mL
Prep Extract Vol: 1 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM09-02**

Client Sample ID: **SWM09-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729006
Lab Project ID: 1175729

Collection Date: 08/16/17 12:45
Received Date: 08/16/17 17:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:11
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:11
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 19:11
Benzene	0.400 U	0.400	0.120	ug/L	1		08/30/17 19:11
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 19:11
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:11
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:11
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/30/17 19:11
Toluene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:11
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.5	81-118		%	1		08/30/17 19:11
4-Bromofluorobenzene (surr)	101	85-114		%	1		08/30/17 19:11
Toluene-d8 (surr)	102	89-112		%	1		08/30/17 19:11

Batch Information

Analytical Batch: VMS17120
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/30/17 19:11
Container ID: 1175729006-F

Prep Batch: VXX31191
Prep Method: SW5030B
Prep Date/Time: 08/30/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of SWM09-02

Client Sample ID: **SWM09-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729006
Lab Project ID: 1175729

Collection Date: 08/16/17 12:45
Received Date: 08/16/17 17:45
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	26.5	5.00	1.55	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729006-E

Print Date: 09/06/2017 1:52:29PM

Results of SWM10-02

Client Sample ID: **SWM10-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729007
 Lab Project ID: 1175729

Collection Date: 08/16/17 12:35
 Received Date: 08/16/17 17:45
 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	1.44	1.00	0.310	ug/L	1		09/02/17 23:00

Batch Information

Analytical Batch: MMS9923
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 09/02/17 23:00
 Container ID: 1175729007-C

Prep Batch: MXX30952
 Prep Method: E200.2
 Prep Date/Time: 08/21/17 09:00
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of **SWM10-02**

Client Sample ID: **SWM10-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729007
Lab Project ID: 1175729

Collection Date: 08/16/17 12:35
Received Date: 08/16/17 17:45
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	2.09	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729007-D

<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	793	9.01	9.01	col/100mL	1		08/16/17 18:04

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 18:04
Container ID: 1175729007-A

Print Date: 09/06/2017 1:52:29PM



Results of **SWM10-02**

Client Sample ID: **SWM10-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729007
Lab Project ID: 1175729

Collection Date: 08/16/17 12:35
Received Date: 08/16/17 17:45
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	137	10.0	3.10	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729007-E

Print Date: 09/06/2017 1:52:29PM

Results of SWM11-02

Client Sample ID: **SWM11-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729008
 Lab Project ID: 1175729

Collection Date: 08/16/17 17:06
 Received Date: 08/16/17 17:45
 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	3.18		1.00	0.310	ug/L	1		09/02/17 23:03

Batch Information

Analytical Batch: MMS9923
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 09/02/17 23:03
 Container ID: 1175729008-C

Prep Batch: MXX30952
 Prep Method: E200.2
 Prep Date/Time: 08/21/17 09:00
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of **SWM11-02**

Client Sample ID: **SWM11-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729008
Lab Project ID: 1175729

Collection Date: 08/16/17 17:06
Received Date: 08/16/17 17:45
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	2.18	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729008-D

<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	7820	90.9	90.9	col/100mL	1		08/16/17 21:57

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 21:57
Container ID: 1175729008-A

Print Date: 09/06/2017 1:52:29PM



Results of SWM11-02

Client Sample ID: **SWM11-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729008
Lab Project ID: 1175729

Collection Date: 08/16/17 17:06
Received Date: 08/16/17 17:45
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	9.90	1.03	0.320	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729008-E

Print Date: 09/06/2017 1:52:29PM

Results of SWM12-02

Client Sample ID: **SWM12-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729009
 Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
 Received Date: 08/16/17 17:45
 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	6.53	1.00	0.310	ug/L	1		09/02/17 23:06

Batch Information

Analytical Batch: MMS9923
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 09/02/17 23:06
 Container ID: 1175729009-C

Prep Batch: MXX30952
 Prep Method: E200.2
 Prep Date/Time: 08/21/17 09:00
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM

Results of SWM12-02

Client Sample ID: **SWM12-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729009
 Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
 Received Date: 08/16/17 17:45
 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	4.98	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 08/17/17 19:39
 Container ID: 1175729009-D

<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	5100	100	100	col/100mL	1		08/16/17 21:57

Batch Information

Analytical Batch: BTF15898
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 08/16/17 21:57
 Container ID: 1175729009-A



Results of SWM12-02

Client Sample ID: **SWM12-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729009
 Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
 Received Date: 08/16/17 17:45
 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	0.0142 U	0.0142	0.00420	ug/L	1		08/28/17 02:13
Acenaphthylene	0.0142 U	0.0142	0.00420	ug/L	1		08/28/17 02:13
Anthracene	0.0142 U	0.0142	0.00420	ug/L	1		08/28/17 02:13
Benzo(a)Anthracene	0.0142 U	0.0142	0.00420	ug/L	1		08/28/17 02:13
Benzo[a]pyrene	0.00568 U	0.00568	0.00170	ug/L	1		08/28/17 02:13
Benzo[b]Fluoranthene	0.0142 U	0.0142	0.00420	ug/L	1		08/28/17 02:13
Benzo[g,h,i]perylene	0.0206	0.0142	0.00420	ug/L	1		08/28/17 02:13
Benzo[k]fluoranthene	0.0142 U	0.0142	0.00420	ug/L	1		08/28/17 02:13
Chrysene	0.0364	0.0142	0.00420	ug/L	1		08/28/17 02:13
Dibenzo[a,h]anthracene	0.00568 U	0.00568	0.00170	ug/L	1		08/28/17 02:13
Fluoranthene	0.0503	0.0142	0.00420	ug/L	1		08/28/17 02:13
Fluorene	0.0142 U	0.0142	0.00420	ug/L	1		08/28/17 02:13
Indeno[1,2,3-c,d] pyrene	0.0142 U	0.0142	0.00420	ug/L	1		08/28/17 02:13
Naphthalene	0.0284 U	0.0284	0.00886	ug/L	1		08/28/17 02:13
Phenanthrene	0.0568 U	0.0568	0.00420	ug/L	1		08/28/17 02:13
Pyrene	0.0645	0.0568	0.00420	ug/L	1		08/28/17 02:13
Surrogates							
2-Methylnaphthalene-d10 (surr)	79	47-106		%	1		08/28/17 02:13
Fluoranthene-d10 (surr)	55.3	24-116		%	1		08/28/17 02:13

Batch Information

Analytical Batch: XMS10351
 Analytical Method: EPA 625M SIM (PAH)
 Analyst: NRB
 Analytical Date/Time: 08/28/17 02:13
 Container ID: 1175729009-I

Prep Batch: XXX38188
 Prep Method: SW3520C
 Prep Date/Time: 08/18/17 08:43
 Prep Initial Wt./Vol.: 880 mL
 Prep Extract Vol: 1 mL

Print Date: 09/06/2017 1:52:29PM

Results of SWM12-02

Client Sample ID: **SWM12-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729009
 Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
 Received Date: 08/16/17 17:45
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:29
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:29
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 19:29
Benzene	0.400 U	0.400	0.120	ug/L	1		08/30/17 19:29
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 19:29
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:29
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:29
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/30/17 19:29
Toluene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:29
Surrogates							
1,2-Dichloroethane-D4 (surr)	98	81-118		%	1		08/30/17 19:29
4-Bromofluorobenzene (surr)	102	85-114		%	1		08/30/17 19:29
Toluene-d8 (surr)	103	89-112		%	1		08/30/17 19:29

Batch Information

Analytical Batch: VMS17120
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/30/17 19:29
 Container ID: 1175729009-F

Prep Batch: VXX31191
 Prep Method: SW5030B
 Prep Date/Time: 08/30/17 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM12-02

Client Sample ID: **SWM12-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729009
Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
Received Date: 08/16/17 17:45
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	65.0	5.00	1.55	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729009-E

Print Date: 09/06/2017 1:52:29PM



Results of SWM12-02 DUP

Client Sample ID: **SWM12-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729010
Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
Received Date: 08/16/17 17:45
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	7.10	1.00	0.310	ug/L	1		09/02/17 23:15

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 23:15
Container ID: 1175729010-C

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM12-02 DUP**

Client Sample ID: **SWM12-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729010
Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
Received Date: 08/16/17 17:45
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	4.99	2.00	2.00	mg/L	1		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 08/17/17 19:39
Container ID: 1175729010-D

<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	6940	90.1	90.1	col/100mL	1		08/16/17 21:57

Batch Information

Analytical Batch: BTF15898
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 08/16/17 21:57
Container ID: 1175729010-A

Print Date: 09/06/2017 1:52:29PM



Results of SWM12-02 DUP

Client Sample ID: SWM12-02 DUP
Client Project ID: MOA Stormwater Management 5078
Lab Sample ID: 1175729010
Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
Received Date: 08/16/17 17:45
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 PAHs like Acenaphthene, Anthracene, Benzo(a)Anthracene, etc., along with their results and limits.

Surrogates

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

Batch Information

Analytical Batch: XMS10351
Analytical Method: EPA 625M SIM (PAH)
Analyst: NRB
Analytical Date/Time: 08/28/17 06:19
Container ID: 1175729010-I

Prep Batch: XXX38188
Prep Method: SW3520C
Prep Date/Time: 08/18/17 08:43
Prep Initial Wt./Vol.: 920 mL
Prep Extract Vol: 1 mL



Results of **SWM12-02 DUP**

Client Sample ID: **SWM12-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729010
Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
Received Date: 08/16/17 17:45
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:47
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:47
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 19:47
Benzene	0.400 U	0.400	0.120	ug/L	1		08/30/17 19:47
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 19:47
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:47
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:47
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/30/17 19:47
Toluene	1.00 U	1.00	0.310	ug/L	1		08/30/17 19:47

Surrogates

1,2-Dichloroethane-D4 (surr)	97.9	81-118		%	1		08/30/17 19:47
4-Bromofluorobenzene (surr)	102	85-114		%	1		08/30/17 19:47
Toluene-d8 (surr)	102	89-112		%	1		08/30/17 19:47

Batch Information

Analytical Batch: VMS17120
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 08/30/17 19:47
Container ID: 1175729010-F

Prep Batch: VXX31191
Prep Method: SW5030B
Prep Date/Time: 08/30/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM12-02 DUP**

Client Sample ID: **SWM12-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729010
Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
Received Date: 08/16/17 17:45
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	68.0	5.00	1.55	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/17/17 17:47
Container ID: 1175729010-E

Print Date: 09/06/2017 1:52:29PM

Results of SWM03-02

Client Sample ID: **SWM03-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729011
 Lab Project ID: 1175729

Collection Date: 08/16/17 15:40
 Received Date: 08/16/17 17:45
 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	2.67	1.00	0.310	ug/L	1		09/02/17 23:18

Batch Information

Analytical Batch: MMS9923
 Analytical Method: EP200.8
 Analyst: VDL
 Analytical Date/Time: 09/02/17 23:18
 Container ID: 1175729011-C

Prep Batch: MXX30952
 Prep Method: E200.2
 Prep Date/Time: 08/21/17 09:00
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Results of SWM03-02

Client Sample ID: **SWM03-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729011
 Lab Project ID: 1175729

Collection Date: 08/16/17 15:40
 Received Date: 08/16/17 17:45
 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		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 08/17/17 19:39
 Container ID: 1175729011-D

<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	845	9.09	9.09	col/100mL	1		08/16/17 21:29

Batch Information

Analytical Batch: BTF15898
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 08/16/17 21:29
 Container ID: 1175729011-A

Results of SWM03-02

Client Sample ID: **SWM03-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729011
 Lab Project ID: 1175729

Collection Date: 08/16/17 15:40
 Received Date: 08/16/17 17:45
 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	9.68	1.06	0.330	mg/L	1		08/17/17 17:47

Batch Information

Analytical Batch: STS5602
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 08/17/17 17:47
 Container ID: 1175729011-E

Print Date: 09/06/2017 1:52:29PM



Results of SWM04-02

Client Sample ID: **SWM04-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729012
Lab Project ID: 1175729

Collection Date: 08/16/17 15:30
Received Date: 08/16/17 17:45
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	2.63	1.00	0.310	ug/L	1		09/02/17 23:27

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 23:27
Container ID: 1175729012-C

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM

Results of SWM04-02

Client Sample ID: **SWM04-02**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729012
 Lab Project ID: 1175729

Collection Date: 08/16/17 15:30
 Received Date: 08/16/17 17:45
 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		08/17/17 19:39

Batch Information

Analytical Batch: BOD5830
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 08/17/17 19:39
 Container ID: 1175729012-D

<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	482	9.09	9.09	col/100mL	1		08/16/17 21:29

Batch Information

Analytical Batch: BTF15898
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 08/16/17 21:29
 Container ID: 1175729012-A



Results of **SWM04-02**

Client Sample ID: **SWM04-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729012
Lab Project ID: 1175729

Collection Date: 08/16/17 15:30
Received Date: 08/16/17 17:45
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	4.62	1.10	0.341	mg/L	1		08/18/17 15:49

Batch Information

Analytical Batch: STS5605
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 08/18/17 15:49
Container ID: 1175729012-E

Print Date: 09/06/2017 1:52:29PM

Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1175729015
 Lab Project ID: 1175729

Collection Date: 08/16/17 12:45
 Received Date: 08/16/17 17:45
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:01
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:01
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 18:01
Benzene	0.400 U	0.400	0.120	ug/L	1		08/30/17 18:01
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		08/30/17 18:01
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:01
o-Xylene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:01
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		08/30/17 18:01
Toluene	1.00 U	1.00	0.310	ug/L	1		08/30/17 18:01
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.8	81-118		%	1		08/30/17 18:01
4-Bromofluorobenzene (surr)	103	85-114		%	1		08/30/17 18:01
Toluene-d8 (surr)	102	89-112		%	1		08/30/17 18:01

Batch Information

Analytical Batch: VMS17120
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 08/30/17 18:01
 Container ID: 1175729015-A

Prep Batch: VXX31191
 Prep Method: SW5030B
 Prep Date/Time: 08/30/17 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **SWM11-02**

Client Sample ID: **SWM11-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729016
Lab Project ID: 1175729

Collection Date: 08/16/17 17:06
Received Date: 08/16/17 17:45
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	12000	500	150	ug/L	1		09/02/17 23:30
Magnesium	1840	50.0	15.0	ug/L	1		09/02/17 23:30

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 23:30
Container ID: 1175729016-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	37.4	5.00	5.00	mg/L	1		09/02/17 23:30

Batch Information

Analytical Batch: MMS9923
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 09/02/17 23:30
Container ID: 1175729016-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM12-02**

Client Sample ID: **SWM12-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729017
Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
Received Date: 08/16/17 17:45
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	20800	500	150	ug/L	1		09/02/17 23:33
Magnesium	5330	50.0	15.0	ug/L	1		09/02/17 23:33

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 23:33
Container ID: 1175729017-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	73.8	5.00	5.00	mg/L	1		09/02/17 23:33

Batch Information

Analytical Batch: MMS9923
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 09/02/17 23:33
Container ID: 1175729017-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM12-02 DUP**

Client Sample ID: **SWM12-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729018
Lab Project ID: 1175729

Collection Date: 08/16/17 16:16
Received Date: 08/16/17 17:45
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	21000	500	150	ug/L	1		09/02/17 23:36
Magnesium	5750	50.0	15.0	ug/L	1		09/02/17 23:36

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 23:36
Container ID: 1175729018-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	76.2	5.00	5.00	mg/L	1		09/02/17 23:36

Batch Information

Analytical Batch: MMS9923
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 09/02/17 23:36
Container ID: 1175729018-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM03-02**

Client Sample ID: **SWM03-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729019
Lab Project ID: 1175729

Collection Date: 08/16/17 15:40
Received Date: 08/16/17 17:45
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	16100	500	150	ug/L	1		09/02/17 22:30
Magnesium	5470	50.0	15.0	ug/L	1		09/02/17 22:30

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 22:30
Container ID: 1175729019-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	62.8	5.00	5.00	mg/L	1		09/02/17 22:30

Batch Information

Analytical Batch: MMS9923
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 09/02/17 22:30
Container ID: 1175729019-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM04-02**

Client Sample ID: **SWM04-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729020
Lab Project ID: 1175729

Collection Date: 08/16/17 15:30
Received Date: 08/16/17 17:45
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	25700	500	150	ug/L	1		09/02/17 23:09
Magnesium	6200	50.0	15.0	ug/L	1		09/02/17 23:09

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 23:09
Container ID: 1175729020-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	89.6	5.00	5.00	mg/L	1		09/02/17 23:09

Batch Information

Analytical Batch: MMS9923
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 09/02/17 23:09
Container ID: 1175729020-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM05-02**

Client Sample ID: **SWM05-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729021
Lab Project ID: 1175729

Collection Date: 08/16/17 14:52
Received Date: 08/16/17 17:45
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	9330	500	150	ug/L	1		09/02/17 23:39
Magnesium	2590	50.0	15.0	ug/L	1		09/02/17 23:39

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 23:39
Container ID: 1175729021-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	34.0	5.00	5.00	mg/L	1		09/02/17 23:39

Batch Information

Analytical Batch: MMS9923
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 09/02/17 23:39
Container ID: 1175729021-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM06-02**

Client Sample ID: **SWM06-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729022
Lab Project ID: 1175729

Collection Date: 08/16/17 14:02
Received Date: 08/16/17 17:45
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	3150	500	150	ug/L	1		09/02/17 23:42
Magnesium	767	50.0	15.0	ug/L	1		09/02/17 23:42

Batch Information

Analytical Batch: MMS9923
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 09/02/17 23:42
Container ID: 1175729022-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	11.0	5.00	5.00	mg/L	1		09/02/17 23:42

Batch Information

Analytical Batch: MMS9923
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 09/02/17 23:42
Container ID: 1175729022-A

Prep Batch: MXX30952
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM07-02**

Client Sample ID: **SWM07-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729023
Lab Project ID: 1175729

Collection Date: 08/16/17 13:37
Received Date: 08/16/17 17:45
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	8420	2500	750	ug/L	5		08/21/17 16:48
Magnesium	3650	250	75.0	ug/L	5		08/21/17 16:48

Batch Information

Analytical Batch: MMS9906
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 08/21/17 16:48
Container ID: 1175729023-A

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	36.1	25.0	25.0	mg/L	5		08/21/17 16:48

Batch Information

Analytical Batch: MMS9906
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 08/21/17 16:48
Container ID: 1175729023-A

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM08-02**

Client Sample ID: **SWM08-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729024
Lab Project ID: 1175729

Collection Date: 08/16/17 13:22
Received Date: 08/16/17 17:45
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	5410	500	150	ug/L	1		08/21/17 16:51
Magnesium	1920	50.0	15.0	ug/L	1		08/21/17 16:51

Batch Information

Analytical Batch: MMS9906
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 08/21/17 16:51
Container ID: 1175729024-A

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	21.4	5.00	5.00	mg/L	1		08/21/17 16:51

Batch Information

Analytical Batch: MMS9906
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 08/21/17 16:51
Container ID: 1175729024-A

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM08-02 DUP**

Client Sample ID: **SWM08-02 DUP**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729025
Lab Project ID: 1175729

Collection Date: 08/16/17 13:22
Received Date: 08/16/17 17:45
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	5610	500	150	ug/L	1		08/21/17 16:54
Magnesium	1900	50.0	15.0	ug/L	1		08/21/17 16:54

Batch Information

Analytical Batch: MMS9906	Prep Batch: MXX30951
Analytical Method: EP200.8	Prep Method: E200.2
Analyst: VDL	Prep Date/Time: 08/21/17 09:00
Analytical Date/Time: 08/21/17 16:54	Prep Initial Wt./Vol.: 20 mL
Container ID: 1175729025-A	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	21.8	5.00	5.00	mg/L	1		08/21/17 16:54

Batch Information

Analytical Batch: MMS9906	Prep Batch: MXX30951
Analytical Method: SM21 2340B	Prep Method: E200.2
Analyst: VDL	Prep Date/Time: 08/21/17 09:00
Analytical Date/Time: 08/21/17 16:54	Prep Initial Wt./Vol.: 20 mL
Container ID: 1175729025-A	Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM09-02**

Client Sample ID: **SWM09-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729026
Lab Project ID: 1175729

Collection Date: 08/16/17 12:45
Received Date: 08/16/17 17:45
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	18400	500	150	ug/L	1		08/21/17 16:57
Magnesium	4450	50.0	15.0	ug/L	1		08/21/17 16:57

Batch Information

Analytical Batch: MMS9906
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 08/21/17 16:57
Container ID: 1175729026-A

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	64.2	5.00	5.00	mg/L	1		08/21/17 16:57

Batch Information

Analytical Batch: MMS9906
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 08/21/17 16:57
Container ID: 1175729026-A

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Results of **SWM10-02**

Client Sample ID: **SWM10-02**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1175729027
Lab Project ID: 1175729

Collection Date: 08/16/17 12:35
Received Date: 08/16/17 17:45
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	21000	500	150	ug/L	1		08/21/17 17:09
Magnesium	5090	50.0	15.0	ug/L	1		08/21/17 17:09

Batch Information

Analytical Batch: MMS9906
Analytical Method: EP200.8
Analyst: VDL
Analytical Date/Time: 08/21/17 17:09
Container ID: 1175729027-A

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
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	73.5	5.00	5.00	mg/L	1		08/21/17 17:09

Batch Information

Analytical Batch: MMS9906
Analytical Method: SM21 2340B
Analyst: VDL
Analytical Date/Time: 08/21/17 17:09
Container ID: 1175729027-A

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 08/21/17 09:00
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:29PM



Method Blank

Blank ID: MB for HBN 1766334 [BOD/5830]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1406255

QC for Samples:

1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007, 1175729008, 1175729009, 1175729010, 1175729011, 1175729012

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: BOD5830

Analytical Method: SM21 5210B

Instrument:

Analyst: AKD

Analytical Date/Time: 8/17/2017 7:39:00PM

Print Date: 09/06/2017 1:52:38PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1175729 [BOD5830]

Blank Spike Lab ID: 1406256

Date Analyzed: 08/17/2017 19:39

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007, 1175729008, 1175729009, 1175729010, 1175729011, 1175729012

Results by SM21 5210B

Parameter	Blank Spike (mg/L)			CL
	Spike	Result	Rec (%)	
Biochemical Oxygen Demand	198	192	97	(84.6-115.4

Batch Information

Analytical Batch: **BOD5830**

Analytical Method: **SM21 5210B**

Instrument:

Analyst: **AKD**



Method Blank

Blank ID: MB for HBN 1766260 [BTF/15898]
Blank Lab ID: 1405950

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007

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: BTF15898
Analytical Method: SM21 9222D
Instrument:
Analyst: K.W
Analytical Date/Time: 8/16/2017 6:04:00PM

Print Date: 09/06/2017 1:52:43PM



Method Blank

Blank ID: MB for HBN 1766260 [BTF/15898]
Blank Lab ID: 1405952

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007, 1175729008, 1175729009, 1175729010, 1175729011, 1175729012

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: BTF15898
Analytical Method: SM21 9222D
Instrument:
Analyst: K.W
Analytical Date/Time: 8/16/2017 9:29:00PM

Print Date: 09/06/2017 1:52:43PM



Method Blank

Blank ID: MB for HBN 1766260 [BTF/15898]

Blank Lab ID: 1405953

QC for Samples:

1175729008, 1175729009, 1175729010, 1175729011, 1175729012

Matrix: Water (Surface, Eff., Ground)

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: BTF15898

Analytical Method: SM21 9222D

Instrument:

Analyst: K.W

Analytical Date/Time: 8/16/2017 10:28:00PM

Print Date: 09/06/2017 1:52:43PM

Method Blank

Blank ID: MB for HBN 1766626 [MXX/30951]
Blank Lab ID: 1406861

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1175729023, 1175729024, 1175729025, 1175729026, 1175729027

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
Magnesium	25.0U	50.0	15.0	ug/L

Batch Information

Analytical Batch: MMS9906
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: VDL
Analytical Date/Time: 8/21/2017 5:00:06PM

Prep Batch: MXX30951
Prep Method: E200.2
Prep Date/Time: 8/21/2017 9:00:46AM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1175729 [MXX30951]

Blank Spike Lab ID: 1406862

Date Analyzed: 08/21/2017 16:23

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1175729023, 1175729024, 1175729025, 1175729026, 1175729027

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	9830	98	(85-115)
Magnesium	10000	10200	102	(85-115)

Batch Information

Analytical Batch: **MMS9906**

Analytical Method: **EP200.8**

Instrument: **Perkin Elmer Nexlon P5**

Analyst: **VDL**

Prep Batch: **MXX30951**

Prep Method: **E200.2**

Prep Date/Time: **08/21/2017 09:00**

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

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1406868
 MS Sample ID: 1406870 MS
 MSD Sample ID:

Analysis Date: 08/21/2017 16:35
 Analysis Date: 08/21/2017 16:39
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1175729023, 1175729024, 1175729025, 1175729026, 1175729027

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	24000	10000	34000	100				70-130		
Magnesium	6340	10000	16600	103				70-130		

Batch Information

Analytical Batch: MMS9906
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 8/21/2017 4:39:00PM

Prep Batch: MXX30951
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 8/21/2017 9:00:46AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/06/2017 1:52:50PM

Matrix Spike Summary

Original Sample ID: 1406871
 MS Sample ID: 1406872 MS
 MSD Sample ID:

Analysis Date: 09/02/2017 21:45
 Analysis Date: 09/02/2017 21:48
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1175729023, 1175729024, 1175729025, 1175729026, 1175729027

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	4520	10000	14600	101				70-130		
Magnesium	400	10000	10500	101				70-130		

Batch Information

Analytical Batch: MMS9923
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 9/2/2017 9:48:09PM

Prep Batch: MXX30951
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 8/21/2017 9:00:46AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/06/2017 1:52:50PM

Method Blank

Blank ID: MB for HBN 1766627 [MXX/30952]
 Blank Lab ID: 1406873

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007, 1175729008, 1175729009,
 1175729010, 1175729011, 1175729012, 1175729016, 1175729017, 1175729018, 1175729019, 1175729020, 1175729021,
 1175729022

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: MMS9923
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 9/2/2017 10:24:14PM

Prep Batch: MXX30952
 Prep Method: E200.2
 Prep Date/Time: 8/21/2017 9:00:41AM
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 09/06/2017 1:52:53PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1175729 [MXX30952]

Blank Spike Lab ID: 1406874

Date Analyzed: 09/02/2017 22:27

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007, 1175729008, 1175729009, 1175729010, 1175729011, 1175729012, 1175729016, 1175729017, 1175729018, 1175729019, 1175729020, 1175729021, 1175729022

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	10200	102	(85-115)
Copper	1000	997	100	(85-115)
Magnesium	10000	10400	104	(85-115)

Batch Information

Analytical Batch: **MMS9923**

Analytical Method: **EP200.8**

Instrument: **Perkin Elmer Nexlon P5**

Analyst: **VDL**

Prep Batch: **MXX30952**

Prep Method: **E200.2**

Prep Date/Time: **08/21/2017 09:00**

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

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1406875
 MS Sample ID: 1406876 MS
 MSD Sample ID:

Analysis Date: 09/02/2017 22:30
 Analysis Date: 09/02/2017 22:33
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007,
 1175729008, 1175729009, 1175729019, 1175729020

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	16100	10000	25700	96				70-130		
Copper	4.44	1000	987	98				70-130		
Magnesium	5470	10000	15100	97				70-130		

Batch Information

Analytical Batch: MMS9923
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 9/2/2017 10:33:15PM

Prep Batch: MXX30952
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 8/21/2017 9:00:41AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Matrix Spike Summary

Original Sample ID: 1406877
 MS Sample ID: 1406878 MS
 MSD Sample ID:

Analysis Date: 09/02/2017 23:09
 Analysis Date: 09/02/2017 23:12
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007,
 1175729008, 1175729009, 1175729010, 1175729011, 1175729012, 1175729016, 1175729017,
 1175729018, 1175729020, 1175729021, 1175729022

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	25700	10000	33400	77				70-130		
Copper	3.03	1000	923	92				70-130		
Magnesium	6200	10000	15600	94				70-130		

Batch Information

Analytical Batch: MMS9923
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: VDL
 Analytical Date/Time: 9/2/2017 11:12:19PM

Prep Batch: MXX30952
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 8/21/2017 9:00:41AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1766329 [STS/5602]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1406244

QC for Samples:

1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007, 1175729008, 1175729009, 1175729010, 1175729011

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: STS5602

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Analytical Date/Time: 8/17/2017 5:47:28PM

Print Date: 09/06/2017 1:53:00PM

Duplicate Sample Summary

Original Sample ID: 1175674001

Duplicate Sample ID: 1406247

QC for Samples:

Analysis Date: 08/17/2017 17:47

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	14.3	13.3	mg/L	7.10*	(< 5)

Batch Information

Analytical Batch: STS5602

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Print Date: 09/06/2017 1:53:02PM

Duplicate Sample Summary

Original Sample ID: 1175682001

Duplicate Sample ID: 1406248

QC for Samples:

1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007, 1175729008, 1175729009, 1175729010, 1175729011

Analysis Date: 08/17/2017 17:47

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	367	407	mg/L	10.30*	(< 5)

Batch Information

Analytical Batch: STS5602

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Blank Spike Summary

Blank Spike ID: LCS for HBN 1175729 [STS5602]
 Blank Spike Lab ID: 1406245
 Date Analyzed: 08/17/2017 17:47

Spike Duplicate ID: LCSD for HBN 1175729 [STS5602]
 Spike Duplicate Lab ID: 1406246
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1175729001, 1175729002, 1175729003, 1175729004, 1175729005, 1175729006, 1175729007, 1175729008, 1175729009, 1175729010, 1175729011

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	50	50.5	101	50	51.2	102	(75-125)	1.40	(< 5)

Batch Information

Analytical Batch: STS5602
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: AYC

Method Blank

Blank ID: MB for HBN 1766396 [STS/5605]

Blank Lab ID: 1406521

QC for Samples:

1175729012

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: STS5605

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Analytical Date/Time: 8/18/2017 3:49:23PM

Print Date: 09/06/2017 1:53:05PM

Duplicate Sample Summary

Original Sample ID: 1175733001

Duplicate Sample ID: 1406524

QC for Samples:

1175729012

Analysis Date: 08/18/2017 15:49

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	71.0	72.0	mg/L	1.40	(< 5)

Batch Information

Analytical Batch: STS5605

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Print Date: 09/06/2017 1:53:06PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1175729 [STS5605]
 Blank Spike Lab ID: 1406522
 Date Analyzed: 08/18/2017 15:49

Spike Duplicate ID: LCSD for HBN 1175729 [STS5605]
 Spike Duplicate Lab ID: 1406523
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1175729012

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	50	51.4	103	50	51.0	102	(75-125)	0.78	(< 5)

Batch Information

Analytical Batch: STS5605
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: AYC

Method Blank

Blank ID: MB for HBN 1767324 [VXX/31191]
 Blank Lab ID: 1409706

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1175729001, 1175729003, 1175729006, 1175729009, 1175729010, 1175729015

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Chlorobenzene	0.250U	0.500	0.150	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)	97.1	81-118		%
4-Bromofluorobenzene (surr)	102	85-114		%
Toluene-d8 (surr)	103	89-112		%

Batch Information

Analytical Batch: VMS17120
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: NRB
 Analytical Date/Time: 8/30/2017 12:20:00PM

Prep Batch: VXX31191
 Prep Method: SW5030B
 Prep Date/Time: 8/30/2017 6:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1175729 [VXX31191]
 Blank Spike Lab ID: 1409707
 Date Analyzed: 08/30/2017 12:50

Spike Duplicate ID: LCSD for HBN 1175729 [VXX31191]
 Spike Duplicate Lab ID: 1409708
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1175729001, 1175729003, 1175729006, 1175729009, 1175729010, 1175729015

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2-Dichlorobenzene	30	28.7	96	30	30.2	101	(80-119)	5.10	(< 20)
1,3-Dichlorobenzene	30	29.6	99	30	30.3	101	(80-119)	2.20	(< 20)
1,4-Dichlorobenzene	30	29.4	98	30	30.2	101	(79-118)	2.70	(< 20)
Benzene	30	29.3	98	30	30.1	100	(79-120)	2.70	(< 20)
Chlorobenzene	30	28.7	96	30	29.0	97	(82-118)	0.79	(< 20)
Ethylbenzene	30	30.2	101	30	30.4	101	(79-121)	0.57	(< 20)
o-Xylene	30	30.7	102	30	30.8	103	(78-122)	0.27	(< 20)
P & M -Xylene	60	60.8	101	60	60.6	101	(80-121)	0.27	(< 20)
Toluene	30	29.1	97	30	29.4	98	(80-121)	0.86	(< 20)

Surrogates

1,2-Dichloroethane-D4 (surr)	30	94.7	95	30	94.2	94	(81-118)	0.46
4-Bromofluorobenzene (surr)	30	102	102	30	103	103	(85-114)	1.20
Toluene-d8 (surr)	30	104	104	30	102	102	(89-112)	1.20

Batch Information

Analytical Batch: **VMS17120**
 Analytical Method: **EPA 602/624**
 Instrument: **VPA 780/5975 GC/MS**
 Analyst: **NRB**

Prep Batch: **VXX31191**
 Prep Method: **SW5030B**
 Prep Date/Time: **08/30/2017 06:00**
 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: 1175729009
 MS Sample ID: 1175729013 BMS
 MSD Sample ID: 1175729014 BMSD

Analysis Date: 08/30/2017 19:29
 Analysis Date: 08/30/2017 21:15
 Analysis Date: 08/30/2017 21:33
 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 (%)			
1,2-Dichlorobenzene	1.00U	30.0	30.8	103	30.0	30.5	102	80-119	0.89	(< 20)
1,3-Dichlorobenzene	1.00U	30.0	31.5	105	30.0	31.0	103	80-119	1.70	(< 20)
1,4-Dichlorobenzene	0.500U	30.0	31.5	105	30.0	31.4	105	79-118	0.28	(< 20)
Benzene	0.400U	30.0	31.7	106	30.0	32.3	108	79-120	1.60	(< 20)
Chlorobenzene	0.500U	30.0	30.4	101	30.0	29.9	100	82-118	1.70	(< 20)
Ethylbenzene	1.00U	30.0	32.2	107	30.0	31.6	105	79-121	1.90	(< 20)
o-Xylene	1.00U	30.0	32.4	108	30.0	31.8	106	78-122	1.90	(< 20)
P & M -Xylene	2.00U	60.0	64.8	108	60.0	63.1	105	80-121	2.70	(< 20)
Toluene	1.00U	30.0	31.4	105	30.0	30.7	102	80-121	2.00	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	28.5	95	30.0	28.6	95	81-118	0.29	
4-Bromofluorobenzene (surr)		30.0	31	103	30.0	31.1	104	85-114	0.31	
Toluene-d8 (surr)		30.0	31.2	104	30.0	30.9	103	89-112	0.97	

Batch Information

Analytical Batch: VMS17120
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: NRB
 Analytical Date/Time: 8/30/2017 9:15:00PM

Prep Batch: VXX31191
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 8/30/2017 6:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Method Blank

Blank ID: MB for HBN 1766343 [XXX/38188]
 Blank Lab ID: 1406300

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1175729001, 1175729003, 1175729006, 1175729009, 1175729010

Results by EPA 625M SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.00625U	0.0125	0.00370	ug/L
Acenaphthylene	0.00625U	0.0125	0.00370	ug/L
Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo(a)Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo[a]pyrene	0.00250U	0.00500	0.00150	ug/L
Benzo[b]Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Benzo[g,h,i]perylene	0.00625U	0.0125	0.00370	ug/L
Benzo[k]fluoranthene	0.00625U	0.0125	0.00370	ug/L
Chrysene	0.00625U	0.0125	0.00370	ug/L
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	ug/L
Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Fluorene	0.00625U	0.0125	0.00370	ug/L
Indeno[1,2,3-c,d] pyrene	0.00625U	0.0125	0.00370	ug/L
Naphthalene	0.0125U	0.0250	0.00780	ug/L
Phenanthrene	0.00565J	0.0500	0.00370	ug/L
Pyrene	0.0250U	0.0500	0.00370	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	98.3	47-106		%
Fluoranthene-d10 (surr)	96.5	24-116		%

Batch Information

Analytical Batch: XMS10351
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: NRB
 Analytical Date/Time: 8/27/2017 10:49:00PM

Prep Batch: XXX38188
 Prep Method: SW3520C
 Prep Date/Time: 8/18/2017 8:43:57AM
 Prep Initial Wt./Vol.: 1000 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1175729 [XXX38188]
 Blank Spike Lab ID: 1406301
 Date Analyzed: 08/27/2017 23:09

Spike Duplicate ID: LCSD for HBN 1175729
 [XXX38188]
 Spike Duplicate Lab ID: 1406302
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1175729001, 1175729003, 1175729006, 1175729009, 1175729010

Results by EPA 625M SIM (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.5	0.490	98	0.5	0.511	102	(48-114)	4.30	(< 20)
Acenaphthylene	0.5	0.406	81	0.5	0.428	86	(35-121)	5.30	(< 20)
Anthracene	0.5	0.396	79	0.5	0.421	84	(53-119)	6.00	(< 20)
Benzo(a)Anthracene	0.5	0.393	79	0.5	0.406	81	(59-120)	3.40	(< 20)
Benzo[a]pyrene	0.5	0.387	77	0.5	0.393	79	(53-120)	1.60	(< 20)
Benzo[b]Fluoranthene	0.5	0.397	79	0.5	0.410	82	(53-126)	3.30	(< 20)
Benzo[g,h,i]perylene	0.5	0.348	70	0.5	0.362	72	(44-128)	3.90	(< 20)
Benzo[k]fluoranthene	0.5	0.381	76	0.5	0.389	78	(54-125)	2.00	(< 20)
Chrysene	0.5	0.413	83	0.5	0.421	84	(57-120)	2.10	(< 20)
Dibenzo[a,h]anthracene	0.5	0.347	69	0.5	0.373	75	(44-131)	7.20	(< 20)
Fluoranthene	0.5	0.400	80	0.5	0.416	83	(58-120)	3.90	(< 20)
Fluorene	0.5	0.399	80	0.5	0.422	84	(50-118)	5.70	(< 20)
Indeno[1,2,3-c,d] pyrene	0.5	0.357	71	0.5	0.369	74	(48-130)	3.30	(< 20)
Naphthalene	0.5	0.425	85	0.5	0.451	90	(43-114)	6.00	(< 20)
Phenanthrene	0.5	0.383	77	0.5	0.405	81	(53-115)	5.40	(< 20)
Pyrene	0.5	0.420	84	0.5	0.442	89	(53-121)	5.10	(< 20)

Surrogates

2-Methylnaphthalene-d10 (surr)	0.5	87.4	87	0.5	93.5	94	(47-106)	6.80	
Fluoranthene-d10 (surr)	0.5	83	83	0.5	88.1	88	(24-116)	5.90	

Batch Information

Analytical Batch: XMS10351
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: NRB

Prep Batch: XXX38188
 Prep Method: SW3520C
 Prep Date/Time: 08/18/2017 08:43
 Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL



Billable Matrix Spike Summary

Original Sample ID: 1175729009
 MS Sample ID: 1175729013 BMS
 MSD Sample ID: 1175729014 BMSD

Analysis Date: 08/28/2017 2:13
 Analysis Date: 08/28/2017 6:40
 Analysis Date: 08/28/2017 7:00
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH)

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0142U	0.556	.508	91	0.541	0.433	80	48-114	15.90	(< 20)
Acenaphthylene	0.0142U	0.556	.439	79	0.541	0.385	71	35-121	13.10	(< 20)
Anthracene	0.0142U	0.556	.346	62	0.541	0.295	55	53-119	16.00	(< 20)
Benzo(a)Anthracene	0.0142U	0.556	.217	39 *	0.541	0.157	29 *	59-120	31.70	* (< 20)
Benzo[a]pyrene	0.00568U	0.556	.159	29 *	0.541	0.105	19 *	53-120	41.50	* (< 20)
Benzo[b]Fluoranthene	0.0142U	0.556	.187	34 *	0.541	0.120	22 *	53-126	43.80	* (< 20)
Benzo[g,h,i]perylene	0.0206	0.556	.13	20 *	0.541	0.0841	12 *	44-128	43.00	* (< 20)
Benzo[k]fluoranthene	0.0142U	0.556	.148	27 *	0.541	0.107	20 *	54-125	32.30	* (< 20)
Chrysene	0.0364	0.556	.244	37 *	0.541	0.182	27 *	57-120	29.10	* (< 20)
Dibenzo[a,h]anthracene	0.00568U	0.556	.118	21 *	0.541	0.0754	14 *	44-131	44.40	* (< 20)
Fluoranthene	0.0503	0.556	.353	54 *	0.541	0.274	41 *	58-120	25.30	* (< 20)
Fluorene	0.0142U	0.556	.403	73	0.541	0.345	64	50-118	15.50	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0142U	0.556	.119	22 *	0.541	0.0758	14 *	48-130	44.60	* (< 20)
Naphthalene	0.0284U	0.556	.464	84	0.541	0.403	75	43-114	13.90	(< 20)
Phenanthrene	0.0568U	0.556	.396	71	0.541	0.330	61	53-115	18.10	(< 20)
Pyrene	0.0645	0.556	.369	55	0.541	0.289	42 *	53-121	24.50	* (< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		0.556	.467	84	0.541	0.401	74	47-106	15.20	
Fluoranthene-d10 (surr)		0.556	.334	60	0.541	0.273	51	24-116	20.00	

Batch Information

Analytical Batch: XMS10351
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: NRB
 Analytical Date/Time: 8/28/2017 6:40:00AM

Prep Batch: XXX38188
 Prep Method: Liquid/Liquid Extraction for 625 SIMS
 Prep Date/Time: 8/18/2017 8:43:57AM
 Prep Initial Wt./Vol.: 900.00mL
 Prep Extract Vol: 1.00mL

Print Date: 09/06/2017 1:53:16PM

FEC 01

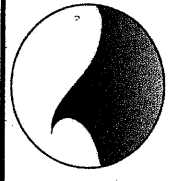
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Chai

To: SGS Environmental Services, Inc.
2100 West Potter Drive
Anchorage, AK 99518
(907) 562-2343
(907) 561-5301 Fax
Contact: Forest Taylor

SGS Quote No. 337618
Bill To:
Municipality of Anchorage
Attn: Kristy Bischofberger
bischofbergerKL.ci.anchorage.ak.us
(907) 343-8058

itic Laboratories, Inc
100 West 2nd Avenue
Anchorage, AK 99501
(907) 276-6178
(907) 278-6881 Fax
Contact: Mark Savoie



Project: MOA Stormwater Management Matrix: Water Project #: 5078

Complete by: 2 weeks

Note: Samples contain sodium thiosulfate for dechlorination

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-02	348-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM12-02	1454-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM12-02 Dup	1454-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM03-02	1224-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM04-02	1224-2			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM05-02	207-1	8/16/17	1452	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	①A	
SWM06-02	314-22		1402	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	②A	
SWM07-02	484-1		1337	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	③A	
SWM08-02	86-1		1322	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	④A	
SWM08-02 Dup	86-1		1322	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑤A	
SWM09-02	499-1		1245	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑥A	
SWM10-02	525-2		1235	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑦A	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KL.I. Email digital reports to msavoie@kinnetlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
<i>Handwritten Signature</i>	8/16/17 1515	HAND	<i>Handwritten Signature</i>	8/16/17
Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
				8/16/17

Qty: 0.4 D 20 HD 15:19

PEC 02

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofberger@kl.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078

Note: Samples contain sodium thiosulfate for dechlorination

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-02	348-1	8-16-17	1706	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	8A	
SWM12-02	1454-1		1616	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	9A	
SWM12-02 Dup	1454-1		1616	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	10A	
SWM03-02	1224-1		1540	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	11A	
SWM04-02	1224-2		1530	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	12A	
SWM05-02	207-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM06-02	314-22			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM07-02	484-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM08-02	86-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM08-02 Dup	86-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM09-02	499-1			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		
SWM10-02	505-2			Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1		

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KL.I. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By: *[Signature]* Date/Time: 8/14/17 17:49


Received By: *[Signature]* Date/Time: 8/10/17 17:45

Relinquished By: *[Signature]* Date/Time: 8/10/17 17:45

Hand del. CS Absent 8/10/17 17:45

1800.0 # D20 21A # D24 31.1 # D24


Chain of Custody Record

To: SGS Environmental Services, Inc. 2-100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	1175729 

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-02	348-1	8-16-17	1706	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑧ B-L 16A	
SWM12-02	1454-1		1616	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑨ B-L 17A	
SWM12-02 Dup	1454-1		1616	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑩ B-L 18A	
SWM03-02	1224-1		1540	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑪ B-L 19A	
SWM04-02	1224-2		1530	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑫ B-L 20A	
SWM05-02	207-1		1452	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑬ B-L 21A	
SWM06-02	314-22		1402	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑭ B-L 22A	
SWM07-02	484-1		1337	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑮ B-L 23A	
SWM08-02	86-1		1322	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑯ B-L 24A	
SWM08-02 Dup	86-1		1322	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑰ B-L 25A	
SWM09-02	499-1		1245	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑱ B-L 26A	
SWM10-02	525-2		1235	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑲ B-L 27A	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments: Dissolved Copper must be Filtered & Preserved at Lab

Sampled and Relinquished By: 	Date/Time: 8-16-17 1744	Transporter: HAND	Received By: CS Savoie Hand.del.	Date/Time: 8/10/17 1745
Relinquished By: TB ① 00020 ② 14 D24 ③ 1.1024		Transporter: Kym Collier	Received By: Kym Collier	Date/Time: 8/10/17 1745

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058
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Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078
Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-02	348-1	8/16/17	1706	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	8D	
SWM12-02	1454-1		1616	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	9D	
SWM12-02 Dup	1454-1		116	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	10D	
SWM03-02	1224-1		1540	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	11D	
SWM04-02	1224-2		1530	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	12D	
SWM05-02	207-1		1452	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	1D	
SWM06-02	314-22		1402	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	2D	
SWM07-02	484-1		1337	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	3D	
SWM08-02	86-1		1322	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	4D	
SWM08-02 Dup	86-1		1322	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	5D	
SWM09-02	499-1		1245	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	6D	
SWM10-02	525-2		1235	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	7D	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By: *[Signature]* Date/Time: 8/16/17 17:44
 Relinquished By: *[Signature]* Date/Time: 8/16/17 17:45

Transporter: HAND Received By: CS Hosen Handdel. Date/Time: 8/16/17 17:45
 Transporter: ③ 1.1024 Received By: *[Signature]* Date/Time: 8/16/17 17:45

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	Project #: 5078 Matrix: Water

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-02	348-1	8/16/17	1706	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	8E	
SWM12-02	1454-1		1616	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	9E	
SWM12-02 Dup	1454-1		1616	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	10E	
SWM03-02	1224-1		1540	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	11E	
SWM04-02	1224-2		1530	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	12A	
SWM05-02	207-1		1452	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	1E	
SWM06-02	314-22		1402	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	2E	
SWM07-02	484-1		1337	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	3E	
SWM08-02	86-1		1322	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	4E	
SWM08-02 Dup	86-1		1322	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	5E	
SWM09-02	499-1		1245	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	6E	
SWM10-02	525-2		1235	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	7E	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By: *[Signature]* Date/Time: 8-16-17 17:44
 Transporter: HAND

Received By: CS: ABSENT Hand del. Date/Time: 8/16/17 17:45

Relinquished By: *[Signature]* Date/Time: 8/16/17 17:45
 Transporter: 21.4 D24 31.4 D24

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc. 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1175729



Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078

Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM12-02	1454-1	8-16-17	1616	Samp/MS/MSD	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	9	① F-H ⑩ AK	
SWM12-02 Dup	1454-1		1616	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	⑩ F-H	
SWM05-02	207-1		1452	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	① F-H	
SWM07-02	484-1		1207/337	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	③ F-H	
SWM09-02	499-1		1245	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	⑥ F-H	
Trip Blank	N/A	N/A	N/A	TB	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	⑮ A-C	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Pa

Sampled and Relinquished By: <i>Bundy D. ...</i>	Transporter: HAND	Received By: CS Abbott Hand del.
Relinquished By:	Date/Time: 8-16-17 1744	Date/Time: 8/16/17 1745
	Transporter:	Received By: Anne Collier
	Date/Time: 000P20 0214024 031024	Date/Time:

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, I 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1175729



Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078
Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM12-02	1454-1	8-16-17	1616	Samp/MS/MSD	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	6	④ I-J (B) ④ D-E	
SWM12-02 Dup	1454-1		1616	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑩ I-J	
SWM05-02	207-1		1452	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	① I-J	
SWM07-02	484-1		1337	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	③ I-J	
SWM09-02	499-1	↓	1245	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑥ I-J	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Page 1 of 1

Sampled and Relinquished By: <i>[Signature]</i>	Date/Time: 8-16-17 1744	Transporter: HAND	Received By: CS Absent Hand del	Date/Time:
Relinquished By:	Date/Time:	Transporter:	Received By: Anne Collier	Date/Time: 8/16/17 1745

① 0.0020 ② 1.4024 ③ 1.024



e-Sample Receipt Form

SGS Workorder #:

1175729



1 1 7 5 7 2 9

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	<input checked="" type="checkbox"/>	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	
<input checked="" type="checkbox"/> **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 @ 0.0 °C Therm. ID: D20
	<input checked="" type="checkbox"/> yes	Cooler ID: 2 @ 1.4 °C Therm. ID: D24
	<input checked="" type="checkbox"/> yes	Cooler ID: 3 @ 1.1 °C Therm. ID: D24
	<input checked="" type="checkbox"/> yes	Cooler ID: 4 @ 0.4 °C Therm. ID: D20
	<input type="checkbox"/> n/a	Cooler ID: @ °C Therm. ID:
*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	
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
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.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	<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):		
All metals samples be poured off into a new sample preserved with HNO3 for Total Hardness analysis. The Original sample will be filtered for the dissolved Copper analysis.		



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>
1175729001-A	Na2S2O3 for Chlorine Redu	OK	1175729006-H	HCL to pH < 2	OK
1175729001-B	No Preservative Required	OK	1175729006-I	No Preservative Required	OK
1175729001-C	HNO3 to pH < 2	PA	1175729006-J	No Preservative Required	OK
1175729001-D	No Preservative Required	OK	1175729007-A	Na2S2O3 for Chlorine Redu	OK
1175729001-E	No Preservative Required	OK	1175729007-B	No Preservative Required	OK
1175729001-F	HCL to pH < 2	OK	1175729007-C	HNO3 to pH < 2	PA
1175729001-G	HCL to pH < 2	OK	1175729007-D	No Preservative Required	OK
1175729001-H	HCL to pH < 2	OK	1175729007-E	No Preservative Required	OK
1175729001-I	No Preservative Required	OK	1175729008-A	Na2S2O3 for Chlorine Redu	OK
1175729001-J	No Preservative Required	OK	1175729008-B	No Preservative Required	OK
1175729002-A	Na2S2O3 for Chlorine Redu	OK	1175729008-C	HNO3 to pH < 2	PA
1175729002-B	No Preservative Required	OK	1175729008-D	No Preservative Required	OK
1175729002-C	HNO3 to pH < 2	PA	1175729008-E	No Preservative Required	OK
1175729002-D	No Preservative Required	OK	1175729009-A	Na2S2O3 for Chlorine Redu	OK
1175729002-E	No Preservative Required	OK	1175729009-B	No Preservative Required	OK
1175729003-A	Na2S2O3 for Chlorine Redu	OK	1175729009-C	HNO3 to pH < 2	PA
1175729003-B	No Preservative Required	OK	1175729009-D	No Preservative Required	OK
1175729003-C	HNO3 to pH < 2	PA	1175729009-E	No Preservative Required	OK
1175729003-D	No Preservative Required	OK	1175729009-F	HCL to pH < 2	OK
1175729003-E	No Preservative Required	OK	1175729009-G	HCL to pH < 2	OK
1175729003-F	HCL to pH < 2	OK	1175729009-H	HCL to pH < 2	OK
1175729003-G	HCL to pH < 2	OK	1175729009-I	No Preservative Required	OK
1175729003-H	HCL to pH < 2	OK	1175729009-J	No Preservative Required	OK
1175729003-I	No Preservative Required	OK	1175729010-A	Na2S2O3 for Chlorine Redu	OK
1175729003-J	No Preservative Required	OK	1175729010-B	No Preservative Required	OK
1175729004-A	Na2S2O3 for Chlorine Redu	OK	1175729010-C	HNO3 to pH < 2	PA
1175729004-B	No Preservative Required	OK	1175729010-D	No Preservative Required	OK
1175729004-C	HNO3 to pH < 2	PA	1175729010-E	No Preservative Required	OK
1175729004-D	No Preservative Required	OK	1175729010-F	HCL to pH < 2	OK
1175729004-E	No Preservative Required	OK	1175729010-G	HCL to pH < 2	OK
1175729005-A	Na2S2O3 for Chlorine Redu	OK	1175729010-H	HCL to pH < 2	OK
1175729005-B	No Preservative Required	OK	1175729010-I	No Preservative Required	OK
1175729005-C	HNO3 to pH < 2	PA	1175729010-J	No Preservative Required	OK
1175729005-D	No Preservative Required	OK	1175729011-A	Na2S2O3 for Chlorine Redu	OK
1175729005-E	No Preservative Required	OK	1175729011-B	No Preservative Required	OK
1175729006-A	Na2S2O3 for Chlorine Redu	OK	1175729011-C	HNO3 to pH < 2	PA
1175729006-B	No Preservative Required	OK	1175729011-D	No Preservative Required	OK
1175729006-C	HNO3 to pH < 2	PA	1175729011-E	No Preservative Required	OK
1175729006-D	No Preservative Required	OK	1175729012-A	Na2S2O3 for Chlorine Redu	OK
1175729006-E	No Preservative Required	OK	1175729012-B	No Preservative Required	OK
1175729006-F	HCL to pH < 2	OK	1175729012-C	HNO3 to pH < 2	PA
1175729006-G	HCL to pH < 2	OK	1175729012-D	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>
1175729012-E	No Preservative Required	OK			
1175729013-A	HCL to pH < 2	OK			
1175729013-B	HCL to pH < 2	OK			
1175729013-C	HCL to pH < 2	OK			
1175729013-D	No Preservative Required	OK			
1175729013-E	No Preservative Required	OK			
1175729014-A	HCL to pH < 2	OK			
1175729014-B	HCL to pH < 2	OK			
1175729014-C	HCL to pH < 2	OK			
1175729014-D	No Preservative Required	OK			
1175729014-E	No Preservative Required	OK			
1175729015-A	HCL to pH < 2	OK			
1175729015-B	HCL to pH < 2	OK			
1175729015-C	HCL to pH < 2	OK			
1175729016-A	HNO3 to pH < 2	PA			
1175729017-A	HNO3 to pH < 2	PA			
1175729018-A	HNO3 to pH < 2	PA			
1175729019-A	HNO3 to pH < 2	PA			
1175729020-A	HNO3 to pH < 2	PA			
1175729021-A	HNO3 to pH < 2	PA			
1175729022-A	HNO3 to pH < 2	PA			
1175729023-A	HNO3 to pH < 2	PA			
1175729024-A	HNO3 to pH < 2	PA			
1175729025-A	HNO3 to pH < 2	PA			
1175729026-A	HNO3 to pH < 2	PA			
1175729027-A	HNO3 to pH < 2	PA			

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.

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.

Appendix B3

Laboratory Data Package Storm Event #3



Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr
PO Box 196650
Anchorage, AK 99519
907-343-8058

Report Number: **1176248**

Client Project: **MOA Stormwater Management**

Dear Kristi Bischofberger,

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 Forest 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.

Forest Taylor
Project Manager
Forest.Taylor@sgs.com

Date

Print Date: 09/18/2017 1:20:18PM

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

Case Narrative

SGS Client: **MOA-Project Mnmt/Engr**
SGS Project: **1176248**
Project Name/Site: **MOA Stormwater Management**
Project Contact: **Kristi Bischofberger**

Refer to sample receipt form for information on sample condition.

SWM12-03 MS (1176248004) BMS

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

SWM12-03 MSD (1176248005) BMSD

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

8270D SIM - PAH BMS/BMSD RPD for Benzo[a]pyrene (20.2%), Dibenzo[a,h]anthracene (21.5%), and Naphthalene (20.6%) does not meet QC criteria. Results for these analytes are considered estimated in the parent sample.

1176235001DUP (1410776) 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.

*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: 09/18/2017 1:20:21PM

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)				
1176248002	SWM12-03	XMS10390	Chrysene	RP
1176248003	SWM12-03 Dup	XMS10390	Chrysene	RP
1176248013	SWM09-03	XMS10390	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.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). 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
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>
SWM11-03	1176248001	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM12-03	1176248002	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM12-03 Dup	1176248003	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM12-03 MS	1176248004	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM12-03 MSD	1176248005	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM03-03	1176248006	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM04-03	1176248007	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM05-03	1176248008	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM06-03	1176248009	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM07-03	1176248010	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM08-03	1176248011	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM08-03 DUP	1176248012	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM09-03	1176248013	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM10-03	1176248014	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
Trip Blank	1176248015	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM11-03	1176248016	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM12-03	1176248017	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM12-03 DUP	1176248018	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM03-03	1176248019	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM04-03	1176248020	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM05-03	1176248021	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM06-03	1176248022	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM07-03	1176248023	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM08-03	1176248024	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM08-03 DUP	1176248025	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM09-03	1176248026	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)
SWM10-03	1176248027	09/01/2017	09/01/2017	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
EPA 602/624	602 Aromatics by 624 (W)
EPA 625M SIM (PAH)	625 Semi-Volatiles GC/MS Liq/Liq ext.
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: 09/18/2017 1:20:24PM

Detectable Results Summary

Client Sample ID: **SWM11-03**

Lab Sample ID: 1176248001

Dissolved Metals by ICP/MS

Microbiology Laboratory

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.67	ug/L
Biochemical Oxygen Demand	2.58	mg/L
Fecal Coliform	36000	col/100mL
Total Suspended Solids	15.1	mg/L

Client Sample ID: **SWM12-03**

Lab Sample ID: 1176248002

Dissolved Metals by ICP/MS

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	5.25	ug/L
Biochemical Oxygen Demand	5.98	mg/L
Fecal Coliform	2800	col/100mL
Benzo[a]pyrene	0.00726	ug/L
Benzo[b]Fluoranthene	0.0231	ug/L
Benzo[g,h,i]perylene	0.0192	ug/L
Fluoranthene	0.0364	ug/L
Total Suspended Solids	51.5	mg/L

Client Sample ID: **SWM12-03 Dup**

Lab Sample ID: 1176248003

Dissolved Metals by ICP/MS

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	5.10	ug/L
Biochemical Oxygen Demand	5.95	mg/L
Fecal Coliform	3000	col/100mL
Benzo[b]Fluoranthene	0.0282	ug/L
Benzo[g,h,i]perylene	0.0236	ug/L
Chrysene	0.0180	ug/L
Fluoranthene	0.0435	ug/L
Pyrene	0.0579	ug/L
Total Suspended Solids	49.7	mg/L

Client Sample ID: **SWM03-03**

Lab Sample ID: 1176248006

Dissolved Metals by ICP/MS

Microbiology Laboratory

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.05	ug/L
Biochemical Oxygen Demand	2.01	mg/L
Fecal Coliform	1720	col/100mL
Total Suspended Solids	13.9	mg/L

Client Sample ID: **SWM04-03**

Lab Sample ID: 1176248007

Dissolved Metals by ICP/MS

Microbiology Laboratory

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.27	ug/L
Fecal Coliform	530	col/100mL
Total Suspended Solids	71.1	mg/L

Client Sample ID: **SWM05-03**

Lab Sample ID: 1176248008

Dissolved Metals by ICP/MS

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	4.50	ug/L
Fecal Coliform	550	col/100mL
Fluoranthene	0.0182	ug/L
Total Suspended Solids	25.4	mg/L

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Detectable Results Summary

Client Sample ID: **SWM06-03**

Lab Sample ID: 1176248009

Dissolved Metals by ICP/MS

Microbiology Laboratory

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.80	ug/L
Fecal Coliform	784	col/100mL
Total Suspended Solids	5.39	mg/L

Client Sample ID: **SWM07-03**

Lab Sample ID: 1176248010

Dissolved Metals by ICP/MS

Microbiology Laboratory

Polynuclear Aromatics GC/MS

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	5.99	ug/L
Biochemical Oxygen Demand	4.12	mg/L
Fecal Coliform	2100	col/100mL
Fluoranthene	0.0144	ug/L
Total Suspended Solids	12.3	mg/L

Client Sample ID: **SWM08-03**

Lab Sample ID: 1176248011

Dissolved Metals by ICP/MS

Microbiology Laboratory

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.56	ug/L
Fecal Coliform	901	col/100mL
Total Suspended Solids	11.6	mg/L

Client Sample ID: **SWM08-03 DUP**

Lab Sample ID: 1176248012

Dissolved Metals by ICP/MS

Microbiology Laboratory

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Copper	2.51	ug/L
Fecal Coliform	892	col/100mL
Total Suspended Solids	10.7	mg/L

Client Sample ID: **SWM09-03**

Lab Sample ID: 1176248013

Microbiology Laboratory

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Fecal Coliform	42	col/100mL
Anthracene	0.0233	ug/L
Benzo(a)Anthracene	0.197	ug/L
Benzo[a]pyrene	0.260	ug/L
Benzo[b]Fluoranthene	0.407	ug/L
Benzo[g,h,i]perylene	0.239	ug/L
Benzo[k]fluoranthene	0.126	ug/L
Chrysene	0.295	ug/L
Dibenzo[a,h]anthracene	0.0468	ug/L
Fluoranthene	0.509	ug/L
Indeno[1,2,3-c,d] pyrene	0.186	ug/L
Phenanthrene	0.168	ug/L
Pyrene	0.406	ug/L
Total Suspended Solids	23.4	mg/L

Waters Department

Client Sample ID: **SWM10-03**

Lab Sample ID: 1176248014

Microbiology Laboratory

Waters Department

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Fecal Coliform	380	col/100mL
Total Suspended Solids	1.70	mg/L

Detectable Results Summary

Client Sample ID: **SWM11-03**

Lab Sample ID: 1176248016

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	6180	ug/L
Hardness as CaCO3	20.3	mg/L
Magnesium	1190	ug/L

Client Sample ID: **SWM12-03**

Lab Sample ID: 1176248017

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	22600	ug/L
Hardness as CaCO3	83.6	mg/L
Magnesium	6590	ug/L

Client Sample ID: **SWM12-03 DUP**

Lab Sample ID: 1176248018

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	23700	ug/L
Hardness as CaCO3	86.6	mg/L
Magnesium	6680	ug/L

Client Sample ID: **SWM03-03**

Lab Sample ID: 1176248019

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	14600	ug/L
Hardness as CaCO3	58.4	mg/L
Magnesium	5310	ug/L

Client Sample ID: **SWM04-03**

Lab Sample ID: 1176248020

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	24100	ug/L
Hardness as CaCO3	86.1	mg/L
Magnesium	6310	ug/L

Client Sample ID: **SWM05-03**

Lab Sample ID: 1176248021

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	16600	ug/L
Hardness as CaCO3	60.1	mg/L
Magnesium	4550	ug/L

Client Sample ID: **SWM06-03**

Lab Sample ID: 1176248022

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	12500	ug/L
Hardness as CaCO3	46.3	mg/L
Magnesium	3670	ug/L

Client Sample ID: **SWM07-03**

Lab Sample ID: 1176248023

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	7540	ug/L
Hardness as CaCO3	22.6	mg/L
Magnesium	917	ug/L

Detectable Results Summary

Client Sample ID: **SWM08-03**

Lab Sample ID: 1176248024

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	15600	ug/L
Hardness as CaCO3	54.8	mg/L
Magnesium	3840	ug/L

Client Sample ID: **SWM08-03 DUP**

Lab Sample ID: 1176248025

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	15900	ug/L
Hardness as CaCO3	56.1	mg/L
Magnesium	3990	ug/L

Client Sample ID: **SWM09-03**

Lab Sample ID: 1176248026

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	27800	ug/L
Hardness as CaCO3	97.5	mg/L
Magnesium	6820	ug/L

Client Sample ID: **SWM10-03**

Lab Sample ID: 1176248027

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	27600	ug/L
Hardness as CaCO3	97.1	mg/L
Magnesium	6880	ug/L

Results of SWM11-03

Client Sample ID: **SWM11-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248001
 Lab Project ID: 1176248

Collection Date: 09/01/17 10:03
 Received Date: 09/01/17 14:11
 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	2.67	1.00	0.310	ug/L	1		09/17/17 12:30

Batch Information

Analytical Batch: MMS9940
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/17/17 12:30
 Container ID: 1176248001-E

Prep Batch: MXX31010
 Prep Method: E200.2
 Prep Date/Time: 09/06/17 09:09
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM11-03**

Client Sample ID: **SWM11-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248001
Lab Project ID: 1176248

Collection Date: 09/01/17 10:03
Received Date: 09/01/17 14:11
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	2.58	2.00	2.00	mg/L	1		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/01/17 18:03
Container ID: 1176248001-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	36000	1000	1000	col/100mL	1		09/01/17 17:17

Batch Information

Analytical Batch: BTF15956
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/01/17 17:17
Container ID: 1176248001-A

Print Date: 09/18/2017 1:20:26PM



Results of SWM11-03

Client Sample ID: **SWM11-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248001
Lab Project ID: 1176248

Collection Date: 09/01/17 10:03
Received Date: 09/01/17 14:11
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	15.1	1.40	0.434	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 09/06/17 18:42
Container ID: 1176248001-C

Print Date: 09/18/2017 1:20:26PM

Results of SWM12-03

Client Sample ID: **SWM12-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248002
 Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
 Received Date: 09/01/17 14:11
 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	5.25	1.00	0.310	ug/L	1		09/17/17 12:33

Batch Information

Analytical Batch: MMS9940
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/17/17 12:33
 Container ID: 1176248002-E

Prep Batch: MXX31010
 Prep Method: E200.2
 Prep Date/Time: 09/06/17 09:09
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of SWM12-03

Client Sample ID: **SWM12-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248002
Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
Received Date: 09/01/17 14:11
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	5.98	2.00	2.00	mg/L	1		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/01/17 18:03
Container ID: 1176248002-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		09/01/17 17:17

Batch Information

Analytical Batch: BTF15956
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/01/17 17:17
Container ID: 1176248002-A

Print Date: 09/18/2017 1:20:26PM



Results of SWM12-03

Client Sample ID: SWM12-03
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1176248002
Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
Received Date: 09/01/17 14:11
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: XMS10390
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 09/08/17 18:19
Container ID: 1176248002-F

Prep Batch: XXX38333
Prep Method: SW3520C
Prep Date/Time: 09/05/17 08:14
Prep Initial Wt./Vol.: 920 mL
Prep Extract Vol: 1 mL



Results of SWM12-03

Client Sample ID: SWM12-03
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1176248002
Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
Received Date: 09/01/17 14:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzene, Chlorobenzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and Surrogates (1,2-Dichloroethane-D4, 4-Bromofluorobenzene, Toluene-d8).

Batch Information

Analytical Batch: VMS17177
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/12/17 19:09
Container ID: 1176248002-H

Prep Batch: VXX31280
Prep Method: SW5030B
Prep Date/Time: 09/12/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17169
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/11/17 20:36
Container ID: 1176248002-H

Prep Batch: VXX31276
Prep Method: SW5030B
Prep Date/Time: 09/11/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Results of SWM12-03

Client Sample ID: **SWM12-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248002
 Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
 Received Date: 09/01/17 14:11
 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	51.5	5.00	1.55	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 09/06/17 18:42
 Container ID: 1176248002-C

Print Date: 09/18/2017 1:20:26PM

Results of SWM12-03 Dup

Client Sample ID: **SWM12-03 Dup**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248003
 Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
 Received Date: 09/01/17 14:11
 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	5.10	1.00	0.310	ug/L	1		09/17/17 12:58

Batch Information

Analytical Batch: MMS9940
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/17/17 12:58
 Container ID: 1176248003-E

Prep Batch: MXX31010
 Prep Method: E200.2
 Prep Date/Time: 09/06/17 09:09
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of SWM12-03 Dup

Client Sample ID: **SWM12-03 Dup**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248003
Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
Received Date: 09/01/17 14:11
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	5.95	2.00	2.00	mg/L	1		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/01/17 18:03
Container ID: 1176248003-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		09/01/17 17:17

Batch Information

Analytical Batch: BTF15956
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/01/17 17:17
Container ID: 1176248003-A

Print Date: 09/18/2017 1:20:26PM



Results of SWM12-03 Dup

Client Sample ID: SWM12-03 Dup
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1176248003
Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
Received Date: 09/01/17 14:11
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: XMS10390
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 09/08/17 18:40
Container ID: 1176248003-F

Prep Batch: XXX38333
Prep Method: SW3520C
Prep Date/Time: 09/05/17 08:14
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL



Results of SWM12-03 Dup

Client Sample ID: **SWM12-03 Dup**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248003
 Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
 Received Date: 09/01/17 14:11
 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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 20:53
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 20:53
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/11/17 20:53
Benzene	0.400 U	0.400	0.120	ug/L	1		09/12/17 19:26
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/11/17 20:53
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 20:53
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/11/17 20:53
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/11/17 20:53
Toluene	1.00 U	1.00	0.310	ug/L	1		09/12/17 19:26
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		09/11/17 20:53
4-Bromofluorobenzene (surr)	103	85-114		%	1		09/11/17 20:53
Toluene-d8 (surr)	96.6	89-112		%	1		09/11/17 20:53

Batch Information

Analytical Batch: VMS17177
 Analytical Method: EPA 602/624
 Analyst: FDR
 Analytical Date/Time: 09/12/17 19:26
 Container ID: 1176248003-H

Prep Batch: VXX31280
 Prep Method: SW5030B
 Prep Date/Time: 09/12/17 00:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Analytical Batch: VMS17169
 Analytical Method: EPA 602/624
 Analyst: FDR
 Analytical Date/Time: 09/11/17 20:53
 Container ID: 1176248003-H

Prep Batch: VXX31276
 Prep Method: SW5030B
 Prep Date/Time: 09/11/17 00:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Print Date: 09/18/2017 1:20:26PM

Results of SWM12-03 Dup

Client Sample ID: **SWM12-03 Dup**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248003
 Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
 Received Date: 09/01/17 14:11
 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	49.7	3.33	1.03	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 09/06/17 18:42
 Container ID: 1176248003-C

Print Date: 09/18/2017 1:20:26PM



Results of SWM03-03

Client Sample ID: **SWM03-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248006
Lab Project ID: 1176248

Collection Date: 09/01/17 09:20
Received Date: 09/01/17 14:11
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	2.05	1.00	0.310	ug/L	1		09/17/17 13:01

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 13:01
Container ID: 1176248006-E

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 09/06/17 09:09
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of SWM03-03

Client Sample ID: **SWM03-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248006
Lab Project ID: 1176248

Collection Date: 09/01/17 09:20
Received Date: 09/01/17 14:11
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	2.01	2.00	2.00	mg/L	1		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/01/17 18:03
Container ID: 1176248006-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	1720	9.01	9.01	col/100mL	1		09/01/17 17:17

Batch Information

Analytical Batch: BTF15956
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/01/17 17:17
Container ID: 1176248006-A

Print Date: 09/18/2017 1:20:26PM

Results of SWM03-03

Client Sample ID: **SWM03-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248006
 Lab Project ID: 1176248

Collection Date: 09/01/17 09:20
 Received Date: 09/01/17 14:11
 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	13.9	1.04	0.323	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 09/06/17 18:42
 Container ID: 1176248006-C

Print Date: 09/18/2017 1:20:26PM



Results of SWM04-03

Client Sample ID: **SWM04-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248007
Lab Project ID: 1176248

Collection Date: 09/01/17 09:27
Received Date: 09/01/17 14:11
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	2.27	1.00	0.310	ug/L	1		09/17/17 13:10

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 13:10
Container ID: 1176248007-E

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 09/06/17 09:09
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM04-03**

Client Sample ID: **SWM04-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248007
Lab Project ID: 1176248

Collection Date: 09/01/17 09:27
Received Date: 09/01/17 14:11
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		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/01/17 18:03
Container ID: 1176248007-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	530	10.0	10.0	col/100mL	1		09/01/17 17:17

Batch Information

Analytical Batch: BTF15956
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/01/17 17:17
Container ID: 1176248007-A

Print Date: 09/18/2017 1:20:26PM

Results of SWM04-03

Client Sample ID: **SWM04-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248007
 Lab Project ID: 1176248

Collection Date: 09/01/17 09:27
 Received Date: 09/01/17 14:11
 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	71.1	1.08	0.333	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 09/06/17 18:42
 Container ID: 1176248007-C

Print Date: 09/18/2017 1:20:26PM



Results of SWM05-03

Client Sample ID: **SWM05-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248008
Lab Project ID: 1176248

Collection Date: 09/01/17 11:25
Received Date: 09/01/17 14:11
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	4.50	1.00	0.310	ug/L	1		09/17/17 12:55

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 12:55
Container ID: 1176248008-E

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 09/06/17 09:09
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM05-03**

Client Sample ID: **SWM05-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248008
Lab Project ID: 1176248

Collection Date: 09/01/17 11:25
Received Date: 09/01/17 14:11
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		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/01/17 18:03
Container ID: 1176248008-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	550	10.0	10.0	col/100mL	1		09/01/17 17:17

Batch Information

Analytical Batch: BTF15956
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/01/17 17:17
Container ID: 1176248008-A

Print Date: 09/18/2017 1:20:26PM



Results of **SWM05-03**

Client Sample ID: **SWM05-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248008
Lab Project ID: 1176248

Collection Date: 09/01/17 11:25
Received Date: 09/01/17 14:11
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	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Acenaphthylene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Anthracene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Benzo(a)Anthracene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Benzo[a]pyrene	0.00510 U	0.00510	0.00153	ug/L	1		09/08/17 19:41
Benzo[b]Fluoranthene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Benzo[g,h,i]perylene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Benzo[k]fluoranthene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Chrysene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Dibenzo[a,h]anthracene	0.00510 U	0.00510	0.00153	ug/L	1		09/08/17 19:41
Fluoranthene	0.0182	0.0128	0.00378	ug/L	1		09/08/17 19:41
Fluorene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Indeno[1,2,3-c,d] pyrene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 19:41
Naphthalene	0.0255 U	0.0255	0.00796	ug/L	1		09/08/17 19:41
Phenanthrene	0.0510 U	0.0510	0.00378	ug/L	1		09/08/17 19:41
Pyrene	0.0510 U	0.0510	0.00378	ug/L	1		09/08/17 19:41
Surrogates							
2-Methylnaphthalene-d10 (surr)	79.3	47-106		%	1		09/08/17 19:41
Fluoranthene-d10 (surr)	66.4	24-116		%	1		09/08/17 19:41

Batch Information

Analytical Batch: XMS10390
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 09/08/17 19:41
Container ID: 1176248008-F

Prep Batch: XXX38333
Prep Method: SW3520C
Prep Date/Time: 09/05/17 08:14
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL



Results of SWM05-03

Client Sample ID: SWM05-03
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1176248008
Lab Project ID: 1176248

Collection Date: 09/01/17 11:25
Received Date: 09/01/17 14:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Benzene, Chlorobenzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and Surrogates (1,2-Dichloroethane-D4, 4-Bromofluorobenzene, Toluene-d8).

Batch Information

Analytical Batch: VMS17177
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/12/17 19:44
Container ID: 1176248008-H

Prep Batch: VXX31280
Prep Method: SW5030B
Prep Date/Time: 09/12/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17169
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/11/17 21:11
Container ID: 1176248008-H

Prep Batch: VXX31276
Prep Method: SW5030B
Prep Date/Time: 09/11/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of SWM05-03

Client Sample ID: **SWM05-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248008
Lab Project ID: 1176248

Collection Date: 09/01/17 11:25
Received Date: 09/01/17 14:11
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	25.4	2.00	0.620	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 09/06/17 18:42
Container ID: 1176248008-C

Print Date: 09/18/2017 1:20:26PM



Results of SWM06-03

Client Sample ID: **SWM06-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248009
Lab Project ID: 1176248

Collection Date: 09/01/17 12:01
Received Date: 09/01/17 14:11
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	2.80	1.00	0.310	ug/L	1		09/17/17 13:28

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 13:28
Container ID: 1176248009-E

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 09/06/17 09:09
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM

Results of SWM06-03

Client Sample ID: **SWM06-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248009
 Lab Project ID: 1176248

Collection Date: 09/01/17 12:01
 Received Date: 09/01/17 14:11
 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		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 09/01/17 18:03
 Container ID: 1176248009-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	784	9.01	9.01	col/100mL	1		09/01/17 17:17

Batch Information

Analytical Batch: BTF15956
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 09/01/17 17:17
 Container ID: 1176248009-A

Print Date: 09/18/2017 1:20:26PM

Results of SWM06-03

Client Sample ID: **SWM06-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248009
 Lab Project ID: 1176248

Collection Date: 09/01/17 12:01
 Received Date: 09/01/17 14:11
 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	5.39	1.12	0.348	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 09/06/17 18:42
 Container ID: 1176248009-C

Print Date: 09/18/2017 1:20:26PM



Results of **SWM07-03**

Client Sample ID: **SWM07-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248010
Lab Project ID: 1176248

Collection Date: 09/01/17 12:25
Received Date: 09/01/17 14:11
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	5.99	1.00	0.310	ug/L	1		09/17/17 13:31

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 13:31
Container ID: 1176248010-E

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 09/06/17 09:09
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM

Results of SWM07-03

Client Sample ID: **SWM07-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248010
 Lab Project ID: 1176248

Collection Date: 09/01/17 12:25
 Received Date: 09/01/17 14:11
 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	4.12	2.00	2.00	mg/L	1		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 09/01/17 18:03
 Container ID: 1176248010-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	2100	100	100	col/100mL	1		09/01/17 17:52

Batch Information

Analytical Batch: BTF15956
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 09/01/17 17:52
 Container ID: 1176248010-A

Print Date: 09/18/2017 1:20:26PM



Results of SWM07-03

Client Sample ID: **SWM07-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248010
 Lab Project ID: 1176248

Collection Date: 09/01/17 12:25
 Received Date: 09/01/17 14:11
 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	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Acenaphthylene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Anthracene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Benzo(a)Anthracene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Benzo[a]pyrene	0.00510 U	0.00510	0.00153	ug/L	1		09/08/17 20:02
Benzo[b]Fluoranthene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Benzo[g,h,i]perylene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Benzo[k]fluoranthene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Chrysene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Dibenzo[a,h]anthracene	0.00510 U	0.00510	0.00153	ug/L	1		09/08/17 20:02
Fluoranthene	0.0144	0.0128	0.00378	ug/L	1		09/08/17 20:02
Fluorene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Indeno[1,2,3-c,d] pyrene	0.0128 U	0.0128	0.00378	ug/L	1		09/08/17 20:02
Naphthalene	0.0255 U	0.0255	0.00796	ug/L	1		09/08/17 20:02
Phenanthrene	0.0510 U	0.0510	0.00378	ug/L	1		09/08/17 20:02
Pyrene	0.0510 U	0.0510	0.00378	ug/L	1		09/08/17 20:02
Surrogates							
2-Methylnaphthalene-d10 (surr)	72.6	47-106		%	1		09/08/17 20:02
Fluoranthene-d10 (surr)	54	24-116		%	1		09/08/17 20:02

Batch Information

Analytical Batch: XMS10390
 Analytical Method: EPA 625M SIM (PAH)
 Analyst: DSD
 Analytical Date/Time: 09/08/17 20:02
 Container ID: 1176248010-F

Prep Batch: XXX38333
 Prep Method: SW3520C
 Prep Date/Time: 09/05/17 08:14
 Prep Initial Wt./Vol.: 980 mL
 Prep Extract Vol: 1 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM07-03**

Client Sample ID: **SWM07-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248010
Lab Project ID: 1176248

Collection Date: 09/01/17 12:25
Received Date: 09/01/17 14:11
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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:28
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:28
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/11/17 21:28
Benzene	0.400 U	0.400	0.120	ug/L	1		09/12/17 20:01
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/11/17 21:28
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:28
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:28
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/11/17 21:28
Toluene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:28
Surrogates							
1,2-Dichloroethane-D4 (surr)	106	81-118		%	1		09/11/17 21:28
4-Bromofluorobenzene (surr)	102	85-114		%	1		09/11/17 21:28
Toluene-d8 (surr)	95.5	89-112		%	1		09/11/17 21:28

Batch Information

Analytical Batch: VMS17177
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/12/17 20:01
Container ID: 1176248010-H

Prep Batch: VXX31280
Prep Method: SW5030B
Prep Date/Time: 09/12/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Analytical Batch: VMS17169
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/11/17 21:28
Container ID: 1176248010-H

Prep Batch: VXX31276
Prep Method: SW5030B
Prep Date/Time: 09/11/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/18/2017 1:20:26PM

Results of SWM07-03

Client Sample ID: **SWM07-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248010
 Lab Project ID: 1176248

Collection Date: 09/01/17 12:25
 Received Date: 09/01/17 14:11
 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	12.3	2.50	0.775	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 09/06/17 18:42
 Container ID: 1176248010-C

Print Date: 09/18/2017 1:20:26PM



Results of SWM08-03

Client Sample ID: **SWM08-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248011
Lab Project ID: 1176248

Collection Date: 09/01/17 12:30
Received Date: 09/01/17 14:11
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	2.56	1.00	0.310	ug/L	1		09/17/17 13:34

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 13:34
Container ID: 1176248011-E

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 09/06/17 09:09
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of SWM08-03

Client Sample ID: **SWM08-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248011
Lab Project ID: 1176248

Collection Date: 09/01/17 12:30
Received Date: 09/01/17 14:11
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		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/01/17 18:03
Container ID: 1176248011-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	901	9.01	9.01	col/100mL	1		09/01/17 17:52

Batch Information

Analytical Batch: BTF15956
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/01/17 17:52
Container ID: 1176248011-A

Print Date: 09/18/2017 1:20:26PM



Results of SWM08-03

Client Sample ID: **SWM08-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248011
Lab Project ID: 1176248

Collection Date: 09/01/17 12:30
Received Date: 09/01/17 14:11
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	11.6	1.09	0.337	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 09/06/17 18:42
Container ID: 1176248011-C

Print Date: 09/18/2017 1:20:26PM



Results of SWM08-03 DUP

Client Sample ID: **SWM08-03 DUP**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248012
Lab Project ID: 1176248

Collection Date: 09/01/17 12:30
Received Date: 09/01/17 14:11
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	2.51	1.00	0.310	ug/L	1		09/17/17 13:37

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 13:37
Container ID: 1176248012-E

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 09/06/17 09:09
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM08-03 DUP**

Client Sample ID: **SWM08-03 DUP**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248012
Lab Project ID: 1176248

Collection Date: 09/01/17 12:30
Received Date: 09/01/17 14:11
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		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/01/17 18:03
Container ID: 1176248012-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	892	9.01	9.01	col/100mL	1		09/01/17 17:52

Batch Information

Analytical Batch: BTF15956
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/01/17 17:52
Container ID: 1176248012-A

Print Date: 09/18/2017 1:20:26PM



Results of SWM08-03 DUP

Client Sample ID: **SWM08-03 DUP**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248012
Lab Project ID: 1176248

Collection Date: 09/01/17 12:30
Received Date: 09/01/17 14:11
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	10.7	1.67	0.517	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 09/06/17 18:42
Container ID: 1176248012-C

Print Date: 09/18/2017 1:20:26PM



Results of SWM09-03

Client Sample ID: **SWM09-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248013
Lab Project ID: 1176248

Collection Date: 09/01/17 13:11
Received Date: 09/01/17 14:11
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	1.00 U	1.00	0.310	ug/L	1		09/17/17 13:40

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 13:40
Container ID: 1176248013-E

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 09/06/17 09:09
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM

Results of SWM09-03

Client Sample ID: **SWM09-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248013
 Lab Project ID: 1176248

Collection Date: 09/01/17 13:11
 Received Date: 09/01/17 14:11
 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		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 09/01/17 18:03
 Container ID: 1176248013-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	42	2.00	2.00	col/100mL	1		09/01/17 17:52

Batch Information

Analytical Batch: BTF15956
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 09/01/17 17:52
 Container ID: 1176248013-A

Print Date: 09/18/2017 1:20:26PM



Results of SWM09-03

Client Sample ID: SWM09-03
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1176248013
Lab Project ID: 1176248

Collection Date: 09/01/17 13:11
Received Date: 09/01/17 14:11
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 detection limits.

Batch Information

Analytical Batch: XMS10390
Analytical Method: EPA 625M SIM (PAH)
Analyst: DSD
Analytical Date/Time: 09/08/17 20:22
Container ID: 1176248013-F

Prep Batch: XXX38333
Prep Method: SW3520C
Prep Date/Time: 09/05/17 08:14
Prep Initial Wt./Vol.: 890 mL
Prep Extract Vol: 1 mL



Results of **SWM09-03**

Client Sample ID: **SWM09-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248013
Lab Project ID: 1176248

Collection Date: 09/01/17 13:11
Received Date: 09/01/17 14:11
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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:46
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:46
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/11/17 21:46
Benzene	0.400 U	0.400	0.120	ug/L	1		09/11/17 21:46
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/11/17 21:46
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:46
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:46
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/11/17 21:46
Toluene	1.00 U	1.00	0.310	ug/L	1		09/11/17 21:46
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		09/11/17 21:46
4-Bromofluorobenzene (surr)	103	85-114		%	1		09/11/17 21:46
Toluene-d8 (surr)	96.8	89-112		%	1		09/11/17 21:46

Batch Information

Analytical Batch: VMS17169
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/11/17 21:46
Container ID: 1176248013-H

Prep Batch: VXX31276
Prep Method: SW5030B
Prep Date/Time: 09/11/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/18/2017 1:20:26PM



Results of SWM09-03

Client Sample ID: **SWM09-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248013
Lab Project ID: 1176248

Collection Date: 09/01/17 13:11
Received Date: 09/01/17 14:11
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	23.4	0.990	0.307	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
Analytical Method: SM21 2540D
Analyst: AYC
Analytical Date/Time: 09/06/17 18:42
Container ID: 1176248013-C

Print Date: 09/18/2017 1:20:26PM

Results of SWM10-03

Client Sample ID: **SWM10-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248014
 Lab Project ID: 1176248

Collection Date: 09/01/17 13:20
 Received Date: 09/01/17 14:11
 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	1.00 U	1.00	0.310	ug/L	1		09/17/17 13:43

Batch Information

Analytical Batch: MMS9940
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/17/17 13:43
 Container ID: 1176248014-E

Prep Batch: MXX31010
 Prep Method: E200.2
 Prep Date/Time: 09/06/17 09:09
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM

Results of SWM10-03

Client Sample ID: **SWM10-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248014
 Lab Project ID: 1176248

Collection Date: 09/01/17 13:20
 Received Date: 09/01/17 14:11
 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		09/01/17 18:03

Batch Information

Analytical Batch: BOD5845
 Analytical Method: SM21 5210B
 Analyst: AKD
 Analytical Date/Time: 09/01/17 18:03
 Container ID: 1176248014-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	380	10.0	10.0	col/100mL	1		09/01/17 17:52

Batch Information

Analytical Batch: BTF15956
 Analytical Method: SM21 9222D
 Analyst: K.W
 Analytical Date/Time: 09/01/17 17:52
 Container ID: 1176248014-A

Print Date: 09/18/2017 1:20:26PM

Results of SWM10-03

Client Sample ID: **SWM10-03**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248014
 Lab Project ID: 1176248

Collection Date: 09/01/17 13:20
 Received Date: 09/01/17 14:11
 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	1.70	1.00	0.310	mg/L	1		09/06/17 18:42

Batch Information

Analytical Batch: STS5629
 Analytical Method: SM21 2540D
 Analyst: AYC
 Analytical Date/Time: 09/06/17 18:42
 Container ID: 1176248014-C

Print Date: 09/18/2017 1:20:26PM

Results of Trip Blank

Client Sample ID: **Trip Blank**
 Client Project ID: **MOA Stormwater Management**
 Lab Sample ID: 1176248015
 Lab Project ID: 1176248

Collection Date: 09/01/17 13:20
 Received Date: 09/01/17 14:11
 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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 18:33
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 18:33
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/11/17 18:33
Benzene	0.400 U	0.400	0.120	ug/L	1		09/11/17 18:33
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/11/17 18:33
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/11/17 18:33
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/11/17 18:33
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/11/17 18:33
Toluene	1.00 U	1.00	0.310	ug/L	1		09/11/17 18:33
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	81-118		%	1		09/11/17 18:33
4-Bromofluorobenzene (surr)	103	85-114		%	1		09/11/17 18:33
Toluene-d8 (surr)	96.2	89-112		%	1		09/11/17 18:33

Batch Information

Analytical Batch: VMS17169
 Analytical Method: EPA 602/624
 Analyst: FDR
 Analytical Date/Time: 09/11/17 18:33
 Container ID: 1176248015-A

Prep Batch: VXX31276
 Prep Method: SW5030B
 Prep Date/Time: 09/11/17 00:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SWM11-03

Client Sample ID: **SWM11-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248016
Lab Project ID: 1176248

Collection Date: 09/01/17 10:03
Received Date: 09/01/17 14:11
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	6180	500	150	ug/L	1		09/17/17 14:29
Magnesium	1190	50.0	15.0	ug/L	1		09/17/17 14:29

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 14:29
Container ID: 1176248016-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	20.3	5.00	5.00	mg/L	1		09/17/17 14:29

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 14:29
Container ID: 1176248016-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM12-03**

Client Sample ID: **SWM12-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248017
Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
Received Date: 09/01/17 14:11
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		09/17/17 14:32
Magnesium	6590	50.0	15.0	ug/L	1		09/17/17 14:32

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 14:32
Container ID: 1176248017-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	83.6	5.00	5.00	mg/L	1		09/17/17 14:32

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 14:32
Container ID: 1176248017-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of SWM12-03 DUP

Client Sample ID: SWM12-03 DUP
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1176248018
Lab Project ID: 1176248

Collection Date: 09/01/17 10:38
Received Date: 09/01/17 14:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Calcium and Magnesium.

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 14:41
Container ID: 1176248018-A
Prep Batch: MXX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row includes Hardness as CaCO3.

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 14:41
Container ID: 1176248018-A
Prep Batch: MXX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM03-03**

Client Sample ID: **SWM03-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248019
Lab Project ID: 1176248

Collection Date: 09/01/17 09:20
Received Date: 09/01/17 14:11
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	14600	500	150	ug/L	1		09/17/17 14:44
Magnesium	5310	50.0	15.0	ug/L	1		09/17/17 14:44

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 14:44
Container ID: 1176248019-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	58.4	5.00	5.00	mg/L	1		09/17/17 14:44

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 14:44
Container ID: 1176248019-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM04-03**

Client Sample ID: **SWM04-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248020
Lab Project ID: 1176248

Collection Date: 09/01/17 09:27
Received Date: 09/01/17 14:11
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	24100	500	150	ug/L	1		09/17/17 14:47
Magnesium	6310	50.0	15.0	ug/L	1		09/17/17 14:47

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 14:47
Container ID: 1176248020-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	86.1	5.00	5.00	mg/L	1		09/17/17 14:47

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 14:47
Container ID: 1176248020-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM05-03**

Client Sample ID: **SWM05-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248021
Lab Project ID: 1176248

Collection Date: 09/01/17 11:25
Received Date: 09/01/17 14:11
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	16600	500	150	ug/L	1		09/17/17 14:56
Magnesium	4550	50.0	15.0	ug/L	1		09/17/17 14:56

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 14:56
Container ID: 1176248021-A

Prep Batch: MXX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	60.1	5.00	5.00	mg/L	1		09/17/17 14:56

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 14:56
Container ID: 1176248021-A

Prep Batch: MXX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM06-03**

Client Sample ID: **SWM06-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248022
Lab Project ID: 1176248

Collection Date: 09/01/17 12:01
Received Date: 09/01/17 14:11
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	12500	500	150	ug/L	1		09/17/17 14:59
Magnesium	3670	50.0	15.0	ug/L	1		09/17/17 14:59

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 14:59
Container ID: 1176248022-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	46.3	5.00	5.00	mg/L	1		09/17/17 14:59

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 14:59
Container ID: 1176248022-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of SWM07-03

Client Sample ID: **SWM07-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248023
Lab Project ID: 1176248

Collection Date: 09/01/17 12:25
Received Date: 09/01/17 14:11
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	7540	500	150	ug/L	1		09/17/17 15:02
Magnesium	917	50.0	15.0	ug/L	1		09/17/17 15:02

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 15:02
Container ID: 1176248023-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	22.6	5.00	5.00	mg/L	1		09/17/17 15:02

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 15:02
Container ID: 1176248023-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM08-03**

Client Sample ID: **SWM08-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248024
Lab Project ID: 1176248

Collection Date: 09/01/17 12:30
Received Date: 09/01/17 14:11
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	15600	500	150	ug/L	1		09/17/17 15:05
Magnesium	3840	50.0	15.0	ug/L	1		09/17/17 15:05

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 15:05
Container ID: 1176248024-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	54.8	5.00	5.00	mg/L	1		09/17/17 15:05

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 15:05
Container ID: 1176248024-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of SWM08-03 DUP

Client Sample ID: SWM08-03 DUP
Client Project ID: MOA Stormwater Management
Lab Sample ID: 1176248025
Lab Project ID: 1176248

Collection Date: 09/01/17 12:30
Received Date: 09/01/17 14:11
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Metals by ICP/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Calcium and Magnesium.

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 15:08
Container ID: 1176248025-A
Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row includes Hardness as CaCO3.

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 15:08
Container ID: 1176248025-A
Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM09-03**

Client Sample ID: **SWM09-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248026
Lab Project ID: 1176248

Collection Date: 09/01/17 13:11
Received Date: 09/01/17 14:11
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	27800	500	150	ug/L	1		09/17/17 15:17
Magnesium	6820	50.0	15.0	ug/L	1		09/17/17 15:17

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 15:17
Container ID: 1176248026-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	97.5	5.00	5.00	mg/L	1		09/17/17 15:17

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 15:17
Container ID: 1176248026-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM



Results of **SWM10-03**

Client Sample ID: **SWM10-03**
Client Project ID: **MOA Stormwater Management**
Lab Sample ID: 1176248027
Lab Project ID: 1176248

Collection Date: 09/01/17 13:20
Received Date: 09/01/17 14:11
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	27600	500	150	ug/L	1		09/17/17 15:20
Magnesium	6880	50.0	15.0	ug/L	1		09/17/17 15:20

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/17/17 15:20
Container ID: 1176248027-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
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	97.1	5.00	5.00	mg/L	1		09/17/17 15:20

Batch Information

Analytical Batch: MMS9940
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/17/17 15:20
Container ID: 1176248027-A

Prep Batch: MX31019
Prep Method: E200.2
Prep Date/Time: 09/07/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 09/18/2017 1:20:26PM

Method Blank

Blank ID: MB for HBN 1767360 [BOD/5845]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1409882

QC for Samples:

1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

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: BOD5845

Analytical Method: SM21 5210B

Instrument:

Analyst: AKD

Analytical Date/Time: 9/1/2017 6:03:00PM

Print Date: 09/18/2017 1:20:31PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176248 [BOD5845]

Blank Spike Lab ID: 1409883

Date Analyzed: 09/01/2017 18:03

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009,
1176248010, 1176248011, 1176248012, 1176248013, 1176248014

Results by SM21 5210B

Parameter	Blank Spike (mg/L)			CL
	Spike	Result	Rec (%)	
Biochemical Oxygen Demand	198	188	95	(84.6-115.4

Batch Information

Analytical Batch: **BOD5845**
 Analytical Method: **SM21 5210B**
 Instrument:
 Analyst: **AKD**



Method Blank

Blank ID: MB for HBN 1767379 [BTF/15956]
Blank Lab ID: 1409988

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009

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: BTF15956
Analytical Method: SM21 9222D
Instrument:
Analyst: K.W
Analytical Date/Time: 9/1/2017 5:17:00PM

Print Date: 09/18/2017 1:20:34PM



Method Blank

Blank ID: MB for HBN 1767379 [BTF/15956]
Blank Lab ID: 1409990

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

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: BTF15956
Analytical Method: SM21 9222D
Instrument:
Analyst: K.W
Analytical Date/Time: 9/1/2017 5:52:00PM

Print Date: 09/18/2017 1:20:34PM

Method Blank

Blank ID: MB for HBN 1767678 [MXX/31010]
Blank Lab ID: 1410481

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

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: MMS9940
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 9/17/2017 12:42:55PM

Prep Batch: MXX31010
Prep Method: E200.2
Prep Date/Time: 9/6/2017 9:09:07AM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176248 [MXX31010]

Blank Spike Lab ID: 1410482

Date Analyzed: 09/17/2017 12:45

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Copper	1000	996	100	(85-115)

Batch Information

Analytical Batch: **MMS9940**

Analytical Method: **EP200.8**

Instrument: **Perkin Elmer Nexlon P5**

Analyst: **ACF**

Prep Batch: **MXX31010**

Prep Method: **E200.2**

Prep Date/Time: **09/06/2017 09:09**

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

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1410483
 MS Sample ID: 1410484 MS
 MSD Sample ID:

Analysis Date: 09/17/2017 12:48
 Analysis Date: 09/17/2017 12:51
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010

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	1210	1000	2190	98				70-130		

Batch Information

Analytical Batch: MMS9940
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/17/2017 12:51:57PM

Prep Batch: MXX31010
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/6/2017 9:09:07AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Matrix Spike Summary

Original Sample ID: 1410485
 MS Sample ID: 1410486 MS
 MSD Sample ID:

Analysis Date: 09/17/2017 13:04
 Analysis Date: 09/17/2017 13:07
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

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	1250	1000	2330	108				70-130		

Batch Information

Analytical Batch: MMS9940
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/17/2017 1:07:07PM

Prep Batch: MXX31010
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/6/2017 9:09:07AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1767758 [MXX/31019]
Blank Lab ID: 1410852

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1176248016, 1176248017, 1176248018, 1176248019, 1176248020, 1176248021, 1176248022, 1176248023, 1176248024, 1176248025, 1176248026, 1176248027

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
Magnesium	25.0U	50.0	15.0	ug/L

Batch Information

Analytical Batch: MMS9940
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 9/17/2017 5:16:59PM

Prep Batch: MXX31019
Prep Method: E200.2
Prep Date/Time: 9/7/2017 9:30:59AM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176248 [MXX31019]
 Blank Spike Lab ID: 1410853
 Date Analyzed: 09/17/2017 17:20

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248016, 1176248017, 1176248018, 1176248019, 1176248020, 1176248021, 1176248022,
 1176248023, 1176248024, 1176248025, 1176248026, 1176248027

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	9760	98	(85-115)
Magnesium	10000	10800	108	(85-115)

Batch Information

Analytical Batch: **MMS9940**
 Analytical Method: **EP200.8**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **ACF**

Prep Batch: **MXX31019**
 Prep Method: **E200.2**
 Prep Date/Time: **09/07/2017 09:30**
 Spike Init Wt./Vol.: 10000 ug/L Extract Vol: 50 mL
 Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1410854
 MS Sample ID: 1410855 MS
 MSD Sample ID:

Analysis Date: 09/17/2017 17:23
 Analysis Date: 09/17/2017 17:26
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1176248016, 1176248017, 1176248018, 1176248019, 1176248020, 1176248021, 1176248022, 1176248023, 1176248024, 1176248025, 1176248026, 1176248027

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	4610	10000	14700	101				70-130		
Magnesium	1980	10000	13100	111				70-130		

Batch Information

Analytical Batch: MMS9940
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/17/2017 5:26:02PM

Prep Batch: MXX31019
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/7/2017 9:30:59AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Print Date: 09/18/2017 1:20:43PM

Method Blank

Blank ID: MB for HBN 1767738 [STS/5629]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1410773

QC for Samples:

1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

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: STS5629

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Analytical Date/Time: 9/6/2017 6:42:00PM

Print Date: 09/18/2017 1:20:49PM

Duplicate Sample Summary

Original Sample ID: 1176235001

Duplicate Sample ID: 1410776

QC for Samples:

1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

Analysis Date: 09/06/2017 18:42

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	7.61	9.35	mg/L	20.50*	(< 5)

Batch Information

Analytical Batch: STS5629

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Print Date: 09/18/2017 1:20:50PM

Duplicate Sample Summary

Original Sample ID: 1176279002

Duplicate Sample ID: 1410777

Analysis Date: 09/06/2017 18:42

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

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	6.33	6.33	mg/L	0.00	(< 5)

Batch Information

Analytical Batch: STS5629

Analytical Method: SM21 2540D

Instrument:

Analyst: AYC

Print Date: 09/18/2017 1:20:50PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176248 [STS5629]
 Blank Spike Lab ID: 1410774
 Date Analyzed: 09/06/2017 18:42

Spike Duplicate ID: LCSD for HBN 1176248 [STS5629]
 Spike Duplicate Lab ID: 1410775
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248001, 1176248002, 1176248003, 1176248006, 1176248007, 1176248008, 1176248009, 1176248010, 1176248011, 1176248012, 1176248013, 1176248014

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	50	50.6	101	50	50.4	101	(75-125)	0.40	(< 5)

Batch Information

Analytical Batch: STS5629
 Analytical Method: SM21 2540D
 Instrument:
 Analyst: AYC

Method Blank

Blank ID: MB for HBN 1768174 [VXX/31276]
 Blank Lab ID: 1412292

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1176248002, 1176248003, 1176248008, 1176248010, 1176248013, 1176248015

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Chlorobenzene	0.250U	0.500	0.150	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)	108	81-118		%
4-Bromofluorobenzene (surr)	104	85-114		%
Toluene-d8 (surr)	97	89-112		%

Batch Information

Analytical Batch: VMS17169
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: FDR
 Analytical Date/Time: 9/11/2017 3:22:00PM

Prep Batch: VXX31276
 Prep Method: SW5030B
 Prep Date/Time: 9/11/2017 12:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176248 [VXX31276]
 Blank Spike Lab ID: 1412293
 Date Analyzed: 09/11/2017 15:39

Spike Duplicate ID: LCSD for HBN 1176248
 [VXX31276]
 Spike Duplicate Lab ID: 1412294
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248002, 1176248003, 1176248008, 1176248010, 1176248013, 1176248015

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2-Dichlorobenzene	30	29.7	99	30	29.5	98	(80-119)	0.84	(< 20)
1,3-Dichlorobenzene	30	29.4	98	30	28.6	95	(80-119)	3.00	(< 20)
1,4-Dichlorobenzene	30	29.1	97	30	29.0	97	(79-118)	0.45	(< 20)
Benzene	30	30.2	101	30	28.9	96	(79-120)	4.60	(< 20)
Chlorobenzene	30	28.9	96	30	28.1	94	(82-118)	2.90	(< 20)
Ethylbenzene	30	30.8	103	30	29.1	97	(79-121)	5.50	(< 20)
o-Xylene	30	31.0	103	30	29.3	98	(78-122)	5.60	(< 20)
P & M -Xylene	60	62.5	104	60	59.1	99	(80-121)	5.60	(< 20)
Toluene	30	28.4	95	30	27.4	91	(80-121)	3.80	(< 20)

Surrogates

1,2-Dichloroethane-D4 (surr)	30	106	106	30	105	105	(81-118)	1.00
4-Bromofluorobenzene (surr)	30	102	102	30	102	102	(85-114)	0.00
Toluene-d8 (surr)	30	97.2	97	30	97.6	98	(89-112)	0.41

Batch Information

Analytical Batch: **VMS17169**
 Analytical Method: **EPA 602/624**
 Instrument: **VPA 780/5975 GC/MS**
 Analyst: **FDR**

Prep Batch: **VXX31276**
 Prep Method: **SW5030B**
 Prep Date/Time: **09/11/2017 00:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Matrix Spike Summary

Original Sample ID: 1412307
 MS Sample ID: 1412308 MS
 MSD Sample ID: 1412309 MSD

Analysis Date: 09/11/2017 20:36
 Analysis Date: 09/12/2017 0:06
 Analysis Date: 09/12/2017 0:24
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248002, 1176248003, 1176248008, 1176248010, 1176248013, 1176248015

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 (%)			
1,2-Dichlorobenzene	0.500U	30.0	30.7	102	30.0	30.0	100	80-119	2.50	(< 20)
1,3-Dichlorobenzene	0.500U	30.0	30	100	30.0	29.3	98	80-119	2.50	(< 20)
1,4-Dichlorobenzene	0.250U	30.0	29.8	99	30.0	29.2	97	79-118	2.00	(< 20)
Benzene	1.06	30.0	31	100	30.0	29.9	96	79-120	3.60	(< 20)
Chlorobenzene	0.250U	30.0	29.7	99	30.0	28.8	96	82-118	3.20	(< 20)
Ethylbenzene	0.500U	30.0	31	103	30.0	30.1	100	79-121	2.80	(< 20)
o-Xylene	0.590J	30.0	31.7	104	30.0	30.4	100	78-122	3.90	(< 20)
P & M -Xylene	0.900J	60.0	63.3	104	60.0	61.5	101	80-121	3.00	(< 20)
Toluene	1.14	30.0	29.7	95	30.0	28.6	92	80-121	3.70	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	30.6	102	30.0	30.7	102	81-118	0.26	
4-Bromofluorobenzene (surr)		30.0	30.5	102	30.0	31.0	103	85-114	1.90	
Toluene-d8 (surr)		30.0	29.4	98	30.0	29.5	99	89-112	0.41	

Batch Information

Analytical Batch: VMS17169
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: FDR
 Analytical Date/Time: 9/12/2017 12:06:00AM

Prep Batch: VXX31276
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 9/11/2017 12:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Billable Matrix Spike Summary

Original Sample ID: 1176248002
 MS Sample ID: 1176248004 BMS
 MSD Sample ID: 1176248005 BMSD

Analysis Date: 09/11/2017 20:36
 Analysis Date: 09/12/2017 0:06
 Analysis Date: 09/12/2017 0:24
 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 (%)			
1,2-Dichlorobenzene	1.00U	30.0	30.7	102	30.0	30.0	100	80-119	2.50	(< 20)
1,3-Dichlorobenzene	1.00U	30.0	30	100	30.0	29.3	98	80-119	2.50	(< 20)
1,4-Dichlorobenzene	0.500U	30.0	29.8	99	30.0	29.2	97	79-118	2.00	(< 20)
Chlorobenzene	0.500U	30.0	29.7	99	30.0	28.8	96	82-118	3.20	(< 20)
Ethylbenzene	1.00U	30.0	31	103	30.0	30.1	100	79-121	2.80	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	30.6	102	30.0	30.7	102	81-118	0.26	
4-Bromofluorobenzene (surr)		30.0	30.5	102	30.0	31.0	103	85-114	1.90	
Toluene-d8 (surr)		30.0	29.4	98	30.0	29.5	99	89-112	0.41	

Batch Information

Analytical Batch: VMS17169
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: FDR
 Analytical Date/Time: 9/12/2017 12:06:00AM

Prep Batch: VXX31276
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 9/11/2017 12:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL



Method Blank

Blank ID: MB for HBN 1768217 [VXX/31280]
Blank Lab ID: 1412476

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176248002, 1176248003, 1176248008, 1176248010

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
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)	106	81-118		%
4-Bromofluorobenzene (surr)	105	85-114		%
Toluene-d8 (surr)	96.7	89-112		%

Batch Information

Analytical Batch: VMS17177
Analytical Method: EPA 602/624
Instrument: VPA 780/5975 GC/MS
Analyst: FDR
Analytical Date/Time: 9/12/2017 3:20:00PM

Prep Batch: VXX31280
Prep Method: SW5030B
Prep Date/Time: 9/12/2017 12:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 09/18/2017 1:20:58PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176248 [VXX31280]
 Blank Spike Lab ID: 1412477
 Date Analyzed: 09/12/2017 15:38

Spike Duplicate ID: LCSD for HBN 1176248 [VXX31280]
 Spike Duplicate Lab ID: 1412478
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248002, 1176248003, 1176248008, 1176248010

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	31.9	106	30	31.6	105	(79-120)	0.91	(< 20)
o-Xylene	30	33.2	111	30	32.8	109	(78-122)	1.30	(< 20)
P & M -Xylene	60	66.7	111	60	65.5	109	(80-121)	1.70	(< 20)
Toluene	30	30.5	102	30	30.1	100	(80-121)	1.30	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	103	103	30	102	102	(81-118)	0.81	
4-Bromofluorobenzene (surr)	30	103	103	30	105	105	(85-114)	1.70	
Toluene-d8 (surr)	30	97.6	98	30	97.1	97	(89-112)	0.48	

Batch Information

Analytical Batch: **VMS17177**
 Analytical Method: **EPA 602/624**
 Instrument: **VPA 780/5975 GC/MS**
 Analyst: **FDR**

Prep Batch: **VXX31280**
 Prep Method: **SW5030B**
 Prep Date/Time: **09/12/2017 00:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL



Matrix Spike Summary

Original Sample ID: 1412479
MS Sample ID: 1412480 MS
MSD Sample ID: 1412481 MSD

Analysis Date: 09/12/2017 22:21
Analysis Date: 09/12/2017 23:49
Analysis Date: 09/13/2017 0:06
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248002, 1176248003, 1176248008, 1176248010

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	32.5	108	30.0	32.4	108	79-120	0.31	(< 20)
o-Xylene	0.500U	30.0	34.1	114	30.0	34.1	114	78-122	0.06	(< 20)
P & M -Xylene	1.00U	60.0	68.3	114	60.0	67.6	113	80-121	1.00	(< 20)
Toluene	0.500U	30.0	31.1	104	30.0	31.0	103	80-121	0.39	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	31.7	106	30.0	31.7	106	81-118	0.16	
4-Bromofluorobenzene (surr)		30.0	30.8	103	30.0	30.9	103	85-114	0.32	
Toluene-d8 (surr)		30.0	28.8	96	30.0	29.0	97	89-112	0.69	

Batch Information

Analytical Batch: VMS17177
Analytical Method: EPA 602/624
Instrument: VPA 780/5975 GC/MS
Analyst: FDR
Analytical Date/Time: 9/12/2017 11:49:00PM

Prep Batch: VXX31280
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 9/12/2017 12:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 09/18/2017 1:21:02PM



Billable Matrix Spike Summary

Original Sample ID: 1176248002
MS Sample ID: 1176248004 BMS
MSD Sample ID: 1176248005 BMSD

Analysis Date: 09/12/2017 19:09
Analysis Date: 09/12/2017 21:11
Analysis Date: 09/12/2017 21:29
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	0.400U	30.0	32.7	109	30.0	32.5	108	79-120	0.40	(< 20)
o-Xylene	1.00U	30.0	33.7	112	30.0	33.5	112	78-122	0.71	(< 20)
P & M -Xylene	2.00U	60.0	67.8	113	60.0	66.6	111	80-121	1.70	(< 20)
Toluene	1.00U	30.0	31	103	30.0	31.0	103	80-121	0.00	(< 20)

Batch Information

Analytical Batch: VMS17177
Analytical Method: EPA 602/624
Instrument: VPA 780/5975 GC/MS
Analyst: FDR
Analytical Date/Time: 9/12/2017 9:11:00PM

Prep Batch: VXX31280
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 9/12/2017 12:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 09/18/2017 1:21:02PM



Method Blank

Blank ID: MB for HBN 1767570 [XXX/38333]
Blank Lab ID: 1410104

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176248002, 1176248003, 1176248008, 1176248010, 1176248013

Results by EPA 625M SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.00625U	0.0125	0.00370	ug/L
Acenaphthylene	0.00625U	0.0125	0.00370	ug/L
Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo(a)Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo[a]pyrene	0.00250U	0.00500	0.00150	ug/L
Benzo[b]Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Benzo[g,h,i]perylene	0.00625U	0.0125	0.00370	ug/L
Benzo[k]fluoranthene	0.00625U	0.0125	0.00370	ug/L
Chrysene	0.00625U	0.0125	0.00370	ug/L
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	ug/L
Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Fluorene	0.00625U	0.0125	0.00370	ug/L
Indeno[1,2,3-c,d] pyrene	0.00625U	0.0125	0.00370	ug/L
Naphthalene	0.0125U	0.0250	0.00780	ug/L
Phenanthrene	0.0250U	0.0500	0.00370	ug/L
Pyrene	0.0250U	0.0500	0.00370	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	82	47-106		%
Fluoranthene-d10 (surr)	80.7	24-116		%

Batch Information

Analytical Batch: XMS10390
Analytical Method: EPA 625M SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: DSD
Analytical Date/Time: 9/8/2017 4:57:00PM

Prep Batch: XXX38333
Prep Method: SW3520C
Prep Date/Time: 9/5/2017 8:14:14AM
Prep Initial Wt./Vol.: 1000 mL
Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176248 [XXX38333]
 Blank Spike Lab ID: 1410105
 Date Analyzed: 09/08/2017 17:17

Spike Duplicate ID: LCSD for HBN 1176248
 [XXX38333]
 Spike Duplicate Lab ID: 1410106
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176248002, 1176248003, 1176248008, 1176248010, 1176248013

Results by EPA 625M SIM (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.5	0.510	102	0.5	0.483	97	(48-114)	5.40	(< 20)
Acenaphthylene	0.5	0.407	82	0.5	0.389	78	(35-121)	4.70	(< 20)
Anthracene	0.5	0.418	84	0.5	0.395	79	(53-119)	5.50	(< 20)
Benzo(a)Anthracene	0.5	0.398	80	0.5	0.381	76	(59-120)	4.40	(< 20)
Benzo[a]pyrene	0.5	0.391	78	0.5	0.362	72	(53-120)	7.80	(< 20)
Benzo[b]Fluoranthene	0.5	0.385	77	0.5	0.369	74	(53-126)	4.40	(< 20)
Benzo[g,h,i]perylene	0.5	0.367	73	0.5	0.350	70	(44-128)	4.60	(< 20)
Benzo[k]fluoranthene	0.5	0.393	79	0.5	0.373	75	(54-125)	5.30	(< 20)
Chrysene	0.5	0.424	85	0.5	0.405	81	(57-120)	4.50	(< 20)
Dibenzo[a,h]anthracene	0.5	0.366	73	0.5	0.348	70	(44-131)	5.20	(< 20)
Fluoranthene	0.5	0.415	83	0.5	0.395	79	(58-120)	4.80	(< 20)
Fluorene	0.5	0.413	83	0.5	0.393	79	(50-118)	5.10	(< 20)
Indeno[1,2,3-c,d] pyrene	0.5	0.369	74	0.5	0.355	71	(48-130)	4.00	(< 20)
Naphthalene	0.5	0.401	80	0.5	0.379	76	(43-114)	5.80	(< 20)
Phenanthrene	0.5	0.408	82	0.5	0.391	78	(53-115)	4.20	(< 20)
Pyrene	0.5	0.434	87	0.5	0.411	82	(53-121)	5.30	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	0.5	89.6	90	0.5	84.9	85	(47-106)	5.40	
Fluoranthene-d10 (surr)	0.5	89.2	89	0.5	85.1	85	(24-116)	4.70	

Batch Information

Analytical Batch: XMS10390
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD

Prep Batch: XXX38333
 Prep Method: SW3520C
 Prep Date/Time: 09/05/2017 08:14
 Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL



Billable Matrix Spike Summary

Original Sample ID: 1176248002
 MS Sample ID: 1176248004 BMS
 MSD Sample ID: 1176248005 BMSD

Analysis Date: 09/08/2017 18:19
 Analysis Date: 09/08/2017 19:00
 Analysis Date: 09/08/2017 19:21
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH)

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0136U	0.510	.372	73	0.521	0.428	82	48-114	13.90	(< 20)
Acenaphthylene	0.0136U	0.510	.307	60	0.521	0.359	69	35-121	15.60	(< 20)
Anthracene	0.0136U	0.510	.274	54	0.521	0.307	59	53-119	11.60	(< 20)
Benzo(a)Anthracene	0.0136U	0.510	.152	30 *	0.521	0.175	34 *	59-120	14.00	(< 20)
Benzo[a]pyrene	0.00726	0.510	.0974	18 *	0.521	0.119	22 *	53-120	20.20	* (< 20)
Benzo[b]Fluoranthene	0.0231	0.510	.115	18 *	0.521	0.138	22 *	53-126	18.30	(< 20)
Benzo[g,h,i]perylene	0.0192	0.510	.0836	13 *	0.521	0.100	16 *	44-128	18.30	(< 20)
Benzo[k]fluoranthene	0.0136U	0.510	.102	20 *	0.521	0.121	23 *	54-125	16.80	(< 20)
Chrysene	0.0136U	0.510	.179	35 *	0.521	0.203	39 *	57-120	12.10	(< 20)
Dibenzo[a,h]anthracene	0.00543U	0.510	.0716	14 *	0.521	0.0889	17 *	44-131	21.50	* (< 20)
Fluoranthene	0.0364	0.510	.257	43 *	0.521	0.289	49 *	58-120	12.00	(< 20)
Fluorene	0.0136U	0.510	.308	60	0.521	0.351	67	50-118	13.10	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0136U	0.510	.0734	14 *	0.521	0.0895	17 *	48-130	19.90	(< 20)
Naphthalene	0.0272U	0.510	.289	57	0.521	0.355	68	43-114	20.60	* (< 20)
Phenanthrene	0.0543U	0.510	.309	61	0.521	0.344	66	53-115	10.80	(< 20)
Pyrene	0.0543U	0.510	.273	54	0.521	0.306	59	53-121	11.40	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		0.510	.328	64	0.521	0.382	73	47-106	15.30	
Fluoranthene-d10 (surr)		0.510	.252	49	0.521	0.292	56	24-116	14.70	


Batch Information

Analytical Batch: XMS10390
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: DSD
 Analytical Date/Time: 9/8/2017 7:00:00PM

Prep Batch: XXX38333
 Prep Method: Liquid/Liquid Extraction for 625 SIMS
 Prep Date/Time: 9/5/2017 8:14:14AM
 Prep Initial Wt./Vol.: 980.00mL
 Prep Extract Vol: 1.00mL

Print Date: 09/18/2017 1:21:06PM

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	1176248 

Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078
Complete by: 2 weeks

Note: Samples contain sodium thiosulfate for dechlorination


Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-03	348-1	09/01/17	1003	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	①A	
SWM12-03	1454-1	}	1038	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	②A	
SWM12-03 Dup	1454-1		1038	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	③A	
SWM03-03	1224-1	}	0920	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	④A	
SWM04-03	1224-2		0927	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑤A	
SWM05-03	207-1	}	1125	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑥A	
SWM06-03	314-22		1201	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑦A	
SWM07-03	484-1	}	1225	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑧A	
SWM08-03	86-1		1230	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑨A	
SWM08-03 Dup	86-1	}	1230	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑩A	
SWM09-03	499-1		1311	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑪A	
SWM10-03	525-2	09/01/17	1320	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑫A	
							<10 °C	1	⑬A	
							<10 °C	1	⑭A	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments: DTR 4.5 #1020 @ 20.0 #DFH 310.7 2017

Sampled and Relinquished By: <i>[Signature]</i>	Date/Time: 9.1.17 1409	Transporter: hand	Date/Time:
Relinquished By: <i>[Signature]</i>	Date/Time:	Transporter: ASAGENA hand del-	Date/Time: 9/11/17

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	1176248 

Project: MOA Stormwater Management **Matrix:** Water **Project No.:** 0000
Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-03	348-1	09/01/17	1008	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	1B	
SWM12-03	1454-1	}	1038	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	2B	
SWM12-03 Dup	1454-1		1038	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	3B	
SWM03-03	1224-1	}	0920	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	4B	
SWM04-03	1224-2		0927	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	7B	
SWM05-03	207-1	}	1125	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	8B	
SWM06-03	314-22		1201	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	9B	
SWM07-03	484-1	}	1225	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	10B	
SWM08-03	86-1		1230	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	11B	
SWM08-03 Dup	86-1	}	1230	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	12B	
SWM09-03	499-1		1311	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	13B	
SWM10-03	525-2	09/01/17	1320	Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	14B	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KL.I. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By: <i>AG</i>	Date/Time: 7-1-17 1409	Transporter: hbrd	Received By: <i>June Olive</i>	Date/Time: 7/1/17
Relinquished By:	Date/Time:	Transporter:	Received By:	Date/Time: 1411

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1176248



Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078
Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-03	348-1	09/01/17	1003	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	1C	
SWM12-03	1454-1		1038	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	2C	
SWM12-03 Dup	1454-1		1038	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	3C	
SWM03-03	1224-1		0920	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	4C	
SWM04-03	1224-2		0927	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	7C	
SWM05-03	207-1		1125	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	8C	
SWM06-03	314-22		1201	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	9C	
SWM07-03	484-1		1225	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	10C	
SWM08-03	86-1		1230	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	11C	
SWM08-03 Dup	86-1		1230	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	12C	
SWM09-03	499-1		1311	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	13C	
SWM10-03	525-2	09/01/17	1320	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	14C	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Page 97 of 100

Sampled and Relinquished By:	Transporter:	Date/Time:	Received By:	Date/Time:
<i>AS</i>	hand	9.1.17	<i>Mark Savoie</i>	9/1/17
Relinquished By:	Transporter:	Date/Time:	Received By:	Date/Time:
				KLI

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofberger@kl.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1176248



Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-03	348-1	9.1.17	1003	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	① D-E ⑩ A	
SWM12-03	1454-1		1038	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	② D-E ⑪ A	
SWM12-03 Dup	1454-1		⑩ 38	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	③ D-E ⑫ A	
SWM03-03	1224-1		0920	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	④ D-E ⑬ A	
SWM04-03	1224-2		0927	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑤ D-E ⑭ A	
SWM05-03	207-1		1125	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑥ D-E ⑮ A	
SWM06-03	314-22		1201	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑦ D-E ⑯ A	
SWM07-03	484-1		1225	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑧ D-E ⑰ A	
SWM08-03	86-1		1230	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑨ D-E ⑱ A	
SWM08-03 Dup	86-1		⑩ 30	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑩ D-E ⑲ A	
SWM09-03	499-1		1311	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑪ D-E ⑳ A	
SWM10-03	525-2	9.1.17	1320	Samp	Diss. Cu/Total Hardness (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	⑫ D-E ㉑ A	

Matrix: Water Project #: 5078

MOA Stormwater Management

Complete by: 2 weeks

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments: Dissolved Copper must be Filtered & Preserved at Lab

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
A. L. Long	9.1.17 1409	hand	Mark Savoie	9/1/17
Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
				AI

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1176248



Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078
Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM12-03	1454-1	9/1/17	1038	Samp/MS/MSD	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	6	② F-G ④ A-B ⑤	
SWM12-03 Dup	1454-1	S	1038	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	③ F-G	
SWM05-03	207-1		1125	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑧ F-G	
SWM07-03	484-1	S	1225	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑩ F-G	
SWM09-03	499-1		09/1/17	011	Samp	TAqH (EPA 625M SIM)	1-L AG	≤ 6 °C	2	⑬ F-G

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Page 3 of 3

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
<i>[Signature]</i>	9/1/17 14:09	hrr	<i>[Signature]</i>	9/1/17
Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
			<i>[Signature]</i>	1411

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	<h1 style="font-size: 2em;">1176248</h1>

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM12-03	1454-1	9/20/17	1058	Samp/MS/MSD	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	9	②H-J ④⑤C-E	
SWM12-03 Dup	1454-1	}	1038	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	③H-J	
SWM05-03	207-1		1125	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	⑧H-J	
SWM07-03	484-1	}	1225	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	⑩H-J	
SWM09-03	499-1		1311	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	③H-J	
Trip Blank	N/A	N/A	N/A	TB	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	⑤A-C ⑬	

Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078

Complete by: 2 weeks

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
<i>[Signature]</i>	9-1-17 1409	G.Larley	<i>[Signature]</i>	9-1-17
Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
				1411



e-Sample Receipt Form

SGS Workorder #:

1176248



1 1 7 6 2 4 8

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	Hand delivered
COC accompanied samples?	<input checked="" type="checkbox"/> Yes	
<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 @ 4.5 °C Therm. ID: D20
	<input checked="" type="checkbox"/> Yes	Cooler ID: 2 @ 0.0 °C Therm. ID: D41
	<input type="checkbox"/> No	Cooler ID: 3 @ 10.7 °C Therm. ID: D24
	<input type="checkbox"/>	Cooler ID: @ °C Therm. ID:
	<input type="checkbox"/>	Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	<input checked="" type="checkbox"/> Yes	
If <0°C, were sample containers ice free?	<input checked="" type="checkbox"/> Yes	
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
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.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	<input checked="" type="checkbox"/> Yes	
Were proper containers (type/mass/volume/preservative***) used?	<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	Trip blank only received with samples 8 "SWM05-03", 10 "SWM07-03", and 13 "SWM09-03"
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	<input type="checkbox"/> No	
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):		
Samples 2J and 5E contained bubbles greater than 6mm		



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>
1176248001-A	Na2S2O3 for Chlorine Redu	OK	1176248007-C	No Preservative Required	OK
1176248001-B	No Preservative Required	OK	1176248007-D	No Preservative Required	OK
1176248001-C	No Preservative Required	OK	1176248007-E	HNO3 to pH < 2	PA
1176248001-D	No Preservative Required	OK	1176248008-A	Na2S2O3 for Chlorine Redu	OK
1176248001-E	HNO3 to pH < 2	PA	1176248008-B	No Preservative Required	OK
1176248002-A	Na2S2O3 for Chlorine Redu	OK	1176248008-C	No Preservative Required	OK
1176248002-B	No Preservative Required	OK	1176248008-D	No Preservative Required	OK
1176248002-C	No Preservative Required	OK	1176248008-E	HNO3 to pH < 2	PA
1176248002-D	No Preservative Required	OK	1176248008-F	No Preservative Required	OK
1176248002-E	HNO3 to pH < 2	PA	1176248008-G	No Preservative Required	OK
1176248002-F	No Preservative Required	OK	1176248008-H	HCL to pH < 2	OK
1176248002-G	No Preservative Required	OK	1176248008-I	HCL to pH < 2	OK
1176248002-H	HCL to pH < 2	OK	1176248008-J	HCL to pH < 2	OK
1176248002-I	HCL to pH < 2	OK	1176248009-A	Na2S2O3 for Chlorine Redu	OK
1176248002-J	HCL to pH < 2	OK	1176248009-B	No Preservative Required	OK
1176248003-A	Na2S2O3 for Chlorine Redu	OK	1176248009-C	No Preservative Required	OK
1176248003-B	No Preservative Required	OK	1176248009-D	No Preservative Required	OK
1176248003-C	No Preservative Required	OK	1176248009-E	HNO3 to pH < 2	PA
1176248003-D	No Preservative Required	OK	1176248010-A	Na2S2O3 for Chlorine Redu	OK
1176248003-E	HNO3 to pH < 2	PA	1176248010-B	No Preservative Required	OK
1176248003-F	No Preservative Required	OK	1176248010-C	No Preservative Required	OK
1176248003-G	No Preservative Required	OK	1176248010-D	No Preservative Required	OK
1176248003-H	HCL to pH < 2	OK	1176248010-E	HNO3 to pH < 2	PA
1176248003-I	HCL to pH < 2	OK	1176248010-F	No Preservative Required	OK
1176248003-J	HCL to pH < 2	OK	1176248010-G	No Preservative Required	OK
1176248004-A	No Preservative Required	OK	1176248010-H	HCL to pH < 2	OK
1176248004-B	No Preservative Required	OK	1176248010-I	HCL to pH < 2	OK
1176248004-C	HCL to pH < 2	OK	1176248010-J	HCL to pH < 2	OK
1176248004-D	HCL to pH < 2	OK	1176248011-A	Na2S2O3 for Chlorine Redu	OK
1176248004-E	HCL to pH < 2	OK	1176248011-B	No Preservative Required	OK
1176248005-A	No Preservative Required	OK	1176248011-C	No Preservative Required	OK
1176248005-B	No Preservative Required	OK	1176248011-D	No Preservative Required	OK
1176248005-C	HCL to pH < 2	OK	1176248011-E	HNO3 to pH < 2	PA
1176248005-D	HCL to pH < 2	OK	1176248012-A	Na2S2O3 for Chlorine Redu	OK
1176248005-E	HCL to pH < 2	OK	1176248012-B	No Preservative Required	OK
1176248006-A	Na2S2O3 for Chlorine Redu	OK	1176248012-C	No Preservative Required	OK
1176248006-B	No Preservative Required	OK	1176248012-D	No Preservative Required	OK
1176248006-C	No Preservative Required	OK	1176248012-E	HNO3 to pH < 2	PA
1176248006-D	No Preservative Required	OK	1176248013-A	Na2S2O3 for Chlorine Redu	OK
1176248006-E	HNO3 to pH < 2	PA	1176248013-B	No Preservative Required	OK
1176248007-A	Na2S2O3 for Chlorine Redu	OK	1176248013-C	No Preservative Required	OK
1176248007-B	No Preservative Required	OK	1176248013-D	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>
1176248013-E	HNO3 to pH < 2	PA			
1176248013-F	No Preservative Required	OK			
1176248013-G	No Preservative Required	OK			
1176248013-H	HCL to pH < 2	OK			
1176248013-I	HCL to pH < 2	OK			
1176248013-J	HCL to pH < 2	OK			
1176248014-A	Na2S2O3 for Chlorine Redu	OK			
1176248014-B	No Preservative Required	OK			
1176248014-C	No Preservative Required	OK			
1176248014-D	No Preservative Required	OK			
1176248014-E	HNO3 to pH < 2	PA			
1176248015-A	HCL to pH < 2	OK			
1176248015-B	HCL to pH < 2	OK			
1176248015-C	HCL to pH < 2	OK			
1176248016-A	HNO3 to pH < 2	PA			
1176248017-A	HNO3 to pH < 2	PA			
1176248018-A	HNO3 to pH < 2	PA			
1176248019-A	HNO3 to pH < 2	PA			
1176248020-A	HNO3 to pH < 2	PA			
1176248021-A	HNO3 to pH < 2	PA			
1176248022-A	HNO3 to pH < 2	PA			
1176248023-A	HNO3 to pH < 2	PA			
1176248024-A	HNO3 to pH < 2	PA			
1176248025-A	HNO3 to pH < 2	PA			
1176248026-A	HNO3 to pH < 2	PA			
1176248027-A	HNO3 to pH < 2	PA			

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.

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.

Appendix B4

Laboratory Data Package Storm Event #4



Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr
PO Box 196650
Anchorage, AK 99519
907-343-8058

Report Number: **1176668**

Client Project: **MOA Stormwater Management 5078**

Dear Kristi Bischofberger,

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 Forest 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.

Forest Taylor
Project Manager
Forest.Taylor@sgs.com

Date

Print Date: 10/06/2017 3:06:33PM

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

Case Narrative

SGS Client: **MOA-Project Mnmt/Engr**
SGS Project: **1176668**
Project Name/Site: **MOA Stormwater Management 5078**
Project Contact: **Kristi Bischofberger**

Refer to sample receipt form for information on sample condition.

SWM12-04 MS (1176668014) BMS

8270D SIM - PAH MS recoveries for several analytes do not meet QC criteria. See LCS for accuracy requirements.

SWM12-04 MSD (1176668015) BMSD

8270D SIM - PAH MSD recoveries for several analytes do not meet QC criteria. See LCS for accuracy requirements.
8270D SIM - PAH MS/MSD RPDs for several analytes do not meet QC criteria. The results for the analytes detected above the LOQ in the parent sample are estimated.

1176641001DUP (1414568) DUP

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

1178396001DUP (1414569) DUP

2540D - Total Suspended Solids - Sample duplicate RPD was outside of acceptance limits. Both sample and duplicate concentrations are less than the LOQ.

LCSD for HBN 1768871 [VXX/3133 (1414624) LCSD

8260C - LCSD RPD for chloroethane (23.1) does not meet QC criteria. This analyte was not detected in associated samples.

*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: 10/06/2017 3:06:34PM

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)				
1176668011	SMW07-04	XMS10452	Chrysene	RSP
1176668012	SMW09-04	XMS10452	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.

Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. 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) for which SGS North America Inc. is Provisionally Certified as of 9/21/2017 & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). 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	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
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>
SMW11-04	1176668001	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW03-04	1176668002	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW04-04	1176668003	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW06-04	1176668004	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW08-04	1176668005	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW08-04 Dup	1176668006	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW10-04	1176668007	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW12-04	1176668008	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW12-04 Dup	1176668009	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW05-04	1176668010	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW07-04	1176668011	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SMW09-04	1176668012	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
Trip Blank	1176668013	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM12-04 MS	1176668014	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM12-04 MSD	1176668015	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM11-04	1176668016	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM12-04	1176668017	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM12-04 Dup	1176668018	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM03-04	1176668019	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM04-04	1176668020	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM05-04	1176668021	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM06-04	1176668022	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM07-04	1176668023	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM08-04	1176668024	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM08-04 Dup	1176668025	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM09-04	1176668026	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)
SWM10-04	1176668027	09/18/2017	09/18/2017	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
EPA 602/624	602 Aromatics by 624 (W)
EPA 625M SIM (PAH)	625 Semi-Volatiles GC/MS Liq/Liq ext.
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: 10/06/2017 3:06:38PM

Detectable Results Summary

Client Sample ID: **SMW11-04**

Lab Sample ID: 1176668001

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	7980	ug/L
Hardness as CaCO ₃	25.5	mg/L
Magnesium	1350	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	7.65	mg/L
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Fecal Coliform	1250	col/100mL
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Waters Department

Total Suspended Solids	35.3	mg/L
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Client Sample ID: **SMW03-04**

Lab Sample ID: 1176668002

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	18400	ug/L
Hardness as CaCO ₃	70.4	mg/L
Magnesium	5940	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	4.53	mg/L
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Fecal Coliform	1200	col/100mL
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Waters Department

Total Suspended Solids	6.80	mg/L
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Client Sample ID: **SMW04-04**

Lab Sample ID: 1176668003

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	23800	ug/L
Hardness as CaCO ₃	89.9	mg/L
Magnesium	7420	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	3.32	mg/L
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Fecal Coliform	58	col/100mL
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Waters Department

Total Suspended Solids	6.80	mg/L
------------------------	------	------

Client Sample ID: **SMW06-04**

Lab Sample ID: 1176668004

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	7350	ug/L
Hardness as CaCO ₃	27.0	mg/L
Magnesium	2090	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	10.7	mg/L
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Fecal Coliform	144	col/100mL
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Waters Department

Total Suspended Solids	7.50	mg/L
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Client Sample ID: **SMW08-04**

Lab Sample ID: 1176668005

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	7240	ug/L
Hardness as CaCO ₃	26.0	mg/L
Magnesium	1930	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	7.86	mg/L
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Fecal Coliform	5200	col/100mL
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Waters Department

Total Suspended Solids	38.7	mg/L
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Detectable Results Summary

Client Sample ID: **SMW08-04 Dup**

Lab Sample ID: 1176668006

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	7270	ug/L
Hardness as CaCO3	26.1	mg/L
Magnesium	1940	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	7.56	mg/L
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Fecal Coliform	4000	col/100mL
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Waters Department

Total Suspended Solids	64.0	mg/L
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Client Sample ID: **SMW10-04**

Lab Sample ID: 1176668007

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	22600	ug/L
Hardness as CaCO3	78.3	mg/L
Magnesium	5310	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	3.66	mg/L
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Fecal Coliform	520	col/100mL
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Waters Department

Total Suspended Solids	14.2	mg/L
------------------------	------	------

Client Sample ID: **SMW12-04**

Lab Sample ID: 1176668008

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	26500	ug/L
Hardness as CaCO3	94.9	mg/L
Magnesium	6990	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	12.3	mg/L
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Fecal Coliform	11700	col/100mL
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Polynuclear Aromatics GC/MS

Benzo[g,h,i]perylene	0.0157	ug/L
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Chrysene	0.0264	ug/L
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Waters Department

Total Suspended Solids	74.4	mg/L
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Client Sample ID: **SMW12-04 Dup**

Lab Sample ID: 1176668009

Metals by ICP/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Calcium	27100	ug/L
Hardness as CaCO3	96.2	mg/L
Magnesium	6950	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	11.9	mg/L
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Fecal Coliform	10300	col/100mL
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Polynuclear Aromatics GC/MS

Benzo[g,h,i]perylene	0.0204	ug/L
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Chrysene	0.0316	ug/L
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Waters Department

Total Suspended Solids	55.6	mg/L
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Detectable Results Summary

Client Sample ID: **SMW05-04**

Lab Sample ID: 1176668010

Metals by ICP/MS

Parameter	Result	Units
Calcium	12600	ug/L
Hardness as CaCO3	44.5	mg/L
Magnesium	3150	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	5.46	mg/L
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Polynuclear Aromatics GC/MS

Benzo[g,h,i]perylene	0.0208	ug/L
Chrysene	0.0388	ug/L
Fluoranthene	0.0464	ug/L

Volatile GC/MS

Toluene	1.53	ug/L
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Waters Department

Total Suspended Solids	56.3	mg/L
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Client Sample ID: **SMW07-04**

Lab Sample ID: 1176668011

Metals by ICP/MS

Parameter	Result	Units
Calcium	9970	ug/L
Hardness as CaCO3	35.3	mg/L
Magnesium	2530	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	11.7	mg/L
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Polynuclear Aromatics GC/MS

Benzo[g,h,i]perylene	0.0314	ug/L
Chrysene	0.0387	ug/L
Pyrene	0.0753	ug/L

Waters Department

Total Suspended Solids	37.3	mg/L
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Client Sample ID: **SMW09-04**

Lab Sample ID: 1176668012

Metals by ICP/MS

Parameter	Result	Units
Calcium	16500	ug/L
Hardness as CaCO3	59.4	mg/L
Magnesium	4420	ug/L

Micro Lab-Provisionally Certified as of 092117 Biochemical Oxygen Demand

Biochemical Oxygen Demand	4.79	mg/L
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Polynuclear Aromatics GC/MS

Benzo(a)Anthracene	0.0469	ug/L
Benzo[b]Fluoranthene	0.0878	ug/L
Benzo[g,h,i]perylene	0.0536	ug/L
Benzo[k]fluoranthene	0.0281	ug/L
Chrysene	0.0824	ug/L
Fluoranthene	0.127	ug/L
Indeno[1,2,3-c,d] pyrene	0.0425	ug/L
Pyrene	0.105	ug/L

Waters Department

Total Suspended Solids	21.5	mg/L
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Client Sample ID: **SWM11-04**

Lab Sample ID: 1176668016

Dissolved Metals by ICP/MS

Parameter	Result	Units
Copper	6.63	ug/L

Detectable Results Summary

Client Sample ID: SWM12-04			
Lab Sample ID: 1176668017	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	3.65	ug/L
Client Sample ID: SWM12-04 Dup			
Lab Sample ID: 1176668018	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	8.57	ug/L
Client Sample ID: SWM03-04			
Lab Sample ID: 1176668019	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	4.91	ug/L
Client Sample ID: SWM04-04			
Lab Sample ID: 1176668020	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	3.54	ug/L
Client Sample ID: SWM05-04			
Lab Sample ID: 1176668021	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	8.57	ug/L
Client Sample ID: SWM06-04			
Lab Sample ID: 1176668022	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	5.51	ug/L
Client Sample ID: SWM07-04			
Lab Sample ID: 1176668023	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	17.6	ug/L
Client Sample ID: SWM08-04			
Lab Sample ID: 1176668024	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	9.11	ug/L
Client Sample ID: SWM08-04 Dup			
Lab Sample ID: 1176668025	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	9.03	ug/L
Client Sample ID: SWM09-04			
Lab Sample ID: 1176668026	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	4.04	ug/L
Client Sample ID: SWM10-04			
Lab Sample ID: 1176668027	<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Dissolved Metals by ICP/MS	Copper	2.55	ug/L

Print Date: 10/06/2017 3:06:39PM



Results of **SMW11-04**

Client Sample ID: **SMW11-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668001
Lab Project ID: 1176668

Collection Date: 09/18/17 12:38
Received Date: 09/18/17 16:25
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	7980	500	150	ug/L	1		09/26/17 00:13
Magnesium	1350	50.0	15.0	ug/L	1		09/26/17 00:13

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:13
Container ID: 1176668001-D

Prep Batch: MX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	25.5	5.00	5.00	mg/L	1		09/26/17 00:13

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:13
Container ID: 1176668001-D

Prep Batch: MX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW11-04**

Client Sample ID: **SMW11-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668001
Lab Project ID: 1176668

Collection Date: 09/18/17 12:38
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	7.65	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668001-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	1250	9.01	9.01	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668001-A

Print Date: 10/06/2017 3:06:40PM



Results of SMW11-04

Client Sample ID: **SMW11-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668001
Lab Project ID: 1176668

Collection Date: 09/18/17 12:38
Received Date: 09/18/17 16:25
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	35.3	6.67	2.07	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
Analytical Method: SM21 2540D
Analyst: EWW
Analytical Date/Time: 09/20/17 15:21
Container ID: 1176668001-C

Print Date: 10/06/2017 3:06:40PM



Results of **SMW03-04**

Client Sample ID: **SMW03-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668002
Lab Project ID: 1176668

Collection Date: 09/18/17 13:06
Received Date: 09/18/17 16:25
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	18400	500	150	ug/L	1		09/26/17 00:19
Magnesium	5940	50.0	15.0	ug/L	1		09/26/17 00:19

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:19
Container ID: 1176668002-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	70.4	5.00	5.00	mg/L	1		09/26/17 00:19

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:19
Container ID: 1176668002-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW03-04**

Client Sample ID: **SMW03-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668002
Lab Project ID: 1176668

Collection Date: 09/18/17 13:06
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	4.53	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668002-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	1200	9.09	9.09	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668002-A

Print Date: 10/06/2017 3:06:40PM

Results of SMW03-04

Client Sample ID: **SMW03-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668002
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:06
 Received Date: 09/18/17 16:25
 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	6.80	4.00	1.24	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
 Analytical Method: SM21 2540D
 Analyst: EWW
 Analytical Date/Time: 09/20/17 15:21
 Container ID: 1176668002-C



Results of **SMW04-04**

Client Sample ID: **SMW04-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668003
Lab Project ID: 1176668

Collection Date: 09/18/17 13:20
Received Date: 09/18/17 16:25
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	23800	500	150	ug/L	1		09/26/17 00:22
Magnesium	7420	50.0	15.0	ug/L	1		09/26/17 00:22

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:22
Container ID: 1176668003-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	89.9	5.00	5.00	mg/L	1		09/26/17 00:22

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:22
Container ID: 1176668003-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW04-04**

Client Sample ID: **SMW04-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668003
Lab Project ID: 1176668

Collection Date: 09/18/17 13:20
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	3.32	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668003-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	58	2.00	2.00	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668003-A

Print Date: 10/06/2017 3:06:40PM

Results of SMW04-04

Client Sample ID: **SMW04-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668003
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:20
 Received Date: 09/18/17 16:25
 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	6.80	2.00	0.620	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
 Analytical Method: SM21 2540D
 Analyst: EWW
 Analytical Date/Time: 09/20/17 15:21
 Container ID: 1176668003-C



Results of **SMW06-04**

Client Sample ID: **SMW06-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668004
Lab Project ID: 1176668

Collection Date: 09/18/17 14:47
Received Date: 09/18/17 16:25
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		09/26/17 00:25
Magnesium	2090	50.0	15.0	ug/L	1		09/26/17 00:25

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:25
Container ID: 1176668004-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	27.0	5.00	5.00	mg/L	1		09/26/17 00:25

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:25
Container ID: 1176668004-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW06-04**

Client Sample ID: **SMW06-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668004
Lab Project ID: 1176668

Collection Date: 09/18/17 14:47
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	10.7	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668004-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	144	1.64	1.64	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668004-A

Print Date: 10/06/2017 3:06:40PM



Results of **SMW06-04**

Client Sample ID: **SMW06-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668004
Lab Project ID: 1176668

Collection Date: 09/18/17 14:47
Received Date: 09/18/17 16:25
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	7.50	2.50	0.775	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
Analytical Method: SM21 2540D
Analyst: EWW
Analytical Date/Time: 09/20/17 15:21
Container ID: 1176668004-C

Print Date: 10/06/2017 3:06:40PM



Results of **SMW08-04**

Client Sample ID: **SMW08-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668005
Lab Project ID: 1176668

Collection Date: 09/18/17 13:16
Received Date: 09/18/17 16:25
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	7240	500	150	ug/L	1		09/26/17 00:28
Magnesium	1930	50.0	15.0	ug/L	1		09/26/17 00:28

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:28
Container ID: 1176668005-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	26.0	5.00	5.00	mg/L	1		09/26/17 00:28

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:28
Container ID: 1176668005-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW08-04**

Client Sample ID: **SMW08-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668005
Lab Project ID: 1176668

Collection Date: 09/18/17 13:16
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	7.86	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668005-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		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668005-A

Print Date: 10/06/2017 3:06:40PM

Results of SMW08-04

Client Sample ID: **SMW08-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668005
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:16
 Received Date: 09/18/17 16:25
 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	38.7	3.33	1.03	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
 Analytical Method: SM21 2540D
 Analyst: EWW
 Analytical Date/Time: 09/20/17 15:21
 Container ID: 1176668005-C



Results of **SMW08-04 Dup**

Client Sample ID: **SMW08-04 Dup**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668006
Lab Project ID: 1176668

Collection Date: 09/18/17 13:16
Received Date: 09/18/17 16:25
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	7270	500	150	ug/L	1		09/26/17 00:31
Magnesium	1940	50.0	15.0	ug/L	1		09/26/17 00:31

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:31
Container ID: 1176668006-D

Prep Batch: MX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	26.1	5.00	5.00	mg/L	1		09/26/17 00:31

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:31
Container ID: 1176668006-D

Prep Batch: MX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW08-04 Dup**

Client Sample ID: **SMW08-04 Dup**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668006
Lab Project ID: 1176668

Collection Date: 09/18/17 13:16
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	7.56	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668006-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	4000	100	100	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668006-A

Print Date: 10/06/2017 3:06:40PM

Results of SMW08-04 Dup

Client Sample ID: **SMW08-04 Dup**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668006
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:16
 Received Date: 09/18/17 16:25
 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	64.0	3.33	1.03	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
 Analytical Method: SM21 2540D
 Analyst: EWW
 Analytical Date/Time: 09/20/17 15:21
 Container ID: 1176668006-C



Results of **SMW10-04**

Client Sample ID: **SMW10-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668007
Lab Project ID: 1176668

Collection Date: 09/18/17 15:51
Received Date: 09/18/17 16:25
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		09/26/17 00:34
Magnesium	5310	50.0	15.0	ug/L	1		09/26/17 00:34

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:34
Container ID: 1176668007-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	78.3	5.00	5.00	mg/L	1		09/26/17 00:34

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:34
Container ID: 1176668007-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW10-04**

Client Sample ID: **SMW10-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668007
Lab Project ID: 1176668

Collection Date: 09/18/17 15:51
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	3.66	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668007-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	520	10.0	10.0	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668007-A

Print Date: 10/06/2017 3:06:40PM



Results of SMW10-04

Client Sample ID: **SMW10-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668007
Lab Project ID: 1176668

Collection Date: 09/18/17 15:51
Received Date: 09/18/17 16:25
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	14.2	1.67	0.517	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
Analytical Method: SM21 2540D
Analyst: EWW
Analytical Date/Time: 09/20/17 15:21
Container ID: 1176668007-C

Print Date: 10/06/2017 3:06:40PM



Results of **SMW12-04**

Client Sample ID: **SMW12-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668008
Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
Received Date: 09/18/17 16:25
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	26500	500	150	ug/L	1		09/26/17 00:44
Magnesium	6990	50.0	15.0	ug/L	1		09/26/17 00:44

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:44
Container ID: 1176668008-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	94.9	5.00	5.00	mg/L	1		09/26/17 00:44

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:44
Container ID: 1176668008-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of SMW12-04

Client Sample ID: **SMW12-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668008
Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Micro Lab-Provisionally Certified as of 092117

<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	12.3	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668008-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	11700	90.9	90.9	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668008-A

Print Date: 10/06/2017 3:06:40PM



Results of **SMW12-04**

Client Sample ID: **SMW12-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668008
Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
Received Date: 09/18/17 16:25
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	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Acenaphthylene	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Anthracene	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Benzo(a)Anthracene	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Benzo[a]pyrene	0.00526 U	0.00526	0.00158	ug/L	1		10/05/17 16:22
Benzo[b]Fluoranthene	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Benzo[g,h,i]perylene	0.0157	0.0132	0.00389	ug/L	1		10/05/17 16:22
Benzo[k]fluoranthene	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Chrysene	0.0264	0.0132	0.00389	ug/L	1		10/05/17 16:22
Dibenzo[a,h]anthracene	0.00526 U	0.00526	0.00158	ug/L	1		10/05/17 16:22
Fluoranthene	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Fluorene	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Indeno[1,2,3-c,d] pyrene	0.0132 U	0.0132	0.00389	ug/L	1		10/05/17 16:22
Naphthalene	0.0263 U	0.0263	0.00821	ug/L	1		10/05/17 16:22
Phenanthrene	0.0526 U	0.0526	0.00389	ug/L	1		10/05/17 16:22
Pyrene	0.0526 U	0.0526	0.00389	ug/L	1		10/05/17 16:22
Surrogates							
2-Methylnaphthalene-d10 (surr)	50.3	47-106		%	1		10/05/17 16:22
Fluoranthene-d10 (surr)	28.1	24-116		%	1		10/05/17 16:22

Batch Information

Analytical Batch: XMS10452
Analytical Method: EPA 625M SIM (PAH)
Analyst: NRB
Analytical Date/Time: 10/05/17 16:22
Container ID: 1176668008-H

Prep Batch: XXX38463
Prep Method: SW3520C
Prep Date/Time: 09/19/17 08:05
Prep Initial Wt./Vol.: 950 mL
Prep Extract Vol: 1 mL

Print Date: 10/06/2017 3:06:40PM

Results of SMW12-04

Client Sample ID: **SMW12-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668008
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
 Received Date: 09/18/17 16:25
 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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 20:58
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 20:58
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 20:58
Benzene	0.400 U	0.400	0.120	ug/L	1		09/19/17 20:58
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 20:58
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 20:58
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/19/17 20:58
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/19/17 20:58
Toluene	1.00 U	1.00	0.310	ug/L	1		09/19/17 20:58
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	81-118		%	1		09/19/17 20:58
4-Bromofluorobenzene (surr)	105	85-114		%	1		09/19/17 20:58
Toluene-d8 (surr)	97.4	89-112		%	1		09/19/17 20:58

Batch Information

Analytical Batch: VMS17211
 Analytical Method: EPA 602/624
 Analyst: FDR
 Analytical Date/Time: 09/19/17 20:58
 Container ID: 1176668008-E

Prep Batch: VXX31335
 Prep Method: SW5030B
 Prep Date/Time: 09/19/17 00:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SMW12-04

Client Sample ID: **SMW12-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668008
Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
Received Date: 09/18/17 16:25
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	74.4	5.56	1.72	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
Analytical Method: SM21 2540D
Analyst: EWW
Analytical Date/Time: 09/20/17 15:21
Container ID: 1176668008-C

Print Date: 10/06/2017 3:06:40PM



Results of **SMW12-04 Dup**

Client Sample ID: **SMW12-04 Dup**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668009
Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
Received Date: 09/18/17 16:25
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	27100	500	150	ug/L	1		09/26/17 00:47
Magnesium	6950	50.0	15.0	ug/L	1		09/26/17 00:47

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:47
Container ID: 1176668009-D

Prep Batch: MX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	96.2	5.00	5.00	mg/L	1		09/26/17 00:47

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:47
Container ID: 1176668009-D

Prep Batch: MX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of SMW12-04 Dup

Client Sample ID: **SMW12-04 Dup**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668009
Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Micro Lab-Provisionally Certified as of 092117

<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	11.9	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668009-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	10300	90.9	90.9	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668009-A

Print Date: 10/06/2017 3:06:40PM



Results of SMW12-04 Dup

Client Sample ID: **SMW12-04 Dup**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668009
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
 Received Date: 09/18/17 16:25
 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	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Acenaphthylene	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Anthracene	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Benzo(a)Anthracene	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Benzo[a]pyrene	0.00532 U	0.00532	0.00160	ug/L	1		10/05/17 16:43
Benzo[b]Fluoranthene	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Benzo[g,h,i]perylene	0.0204	0.0133	0.00394	ug/L	1		10/05/17 16:43
Benzo[k]fluoranthene	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Chrysene	0.0316	0.0133	0.00394	ug/L	1		10/05/17 16:43
Dibenzo[a,h]anthracene	0.00532 U	0.00532	0.00160	ug/L	1		10/05/17 16:43
Fluoranthene	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Fluorene	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Indeno[1,2,3-c,d] pyrene	0.0133 U	0.0133	0.00394	ug/L	1		10/05/17 16:43
Naphthalene	0.0266 U	0.0266	0.00830	ug/L	1		10/05/17 16:43
Phenanthrene	0.0532 U	0.0532	0.00394	ug/L	1		10/05/17 16:43
Pyrene	0.0532 U	0.0532	0.00394	ug/L	1		10/05/17 16:43
Surrogates							
2-Methylnaphthalene-d10 (surr)	52.1	47-106		%	1		10/05/17 16:43
Fluoranthene-d10 (surr)	30.2	24-116		%	1		10/05/17 16:43

Batch Information

Analytical Batch: XMS10452
 Analytical Method: EPA 625M SIM (PAH)
 Analyst: NRB
 Analytical Date/Time: 10/05/17 16:43
 Container ID: 1176668009-H

Prep Batch: XXX38463
 Prep Method: SW3520C
 Prep Date/Time: 09/19/17 08:05
 Prep Initial Wt./Vol.: 940 mL
 Prep Extract Vol: 1 mL

Print Date: 10/06/2017 3:06:40PM

Results of SMW12-04 Dup

Client Sample ID: **SMW12-04 Dup**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668009
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
 Received Date: 09/18/17 16:25
 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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:15
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:15
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 21:15
Benzene	0.400 U	0.400	0.120	ug/L	1		09/19/17 21:15
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 21:15
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:15
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:15
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/19/17 21:15
Toluene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:15
Surrogates							
1,2-Dichloroethane-D4 (surr)	108	81-118		%	1		09/19/17 21:15
4-Bromofluorobenzene (surr)	109	85-114		%	1		09/19/17 21:15
Toluene-d8 (surr)	96.1	89-112		%	1		09/19/17 21:15

Batch Information

Analytical Batch: VMS17211
 Analytical Method: EPA 602/624
 Analyst: FDR
 Analytical Date/Time: 09/19/17 21:15
 Container ID: 1176668009-E

Prep Batch: VXX31335
 Prep Method: SW5030B
 Prep Date/Time: 09/19/17 00:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SMW12-04 Dup

Client Sample ID: **SMW12-04 Dup**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668009
Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
Received Date: 09/18/17 16:25
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	55.6	4.00	1.24	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
Analytical Method: SM21 2540D
Analyst: EWW
Analytical Date/Time: 09/20/17 15:21
Container ID: 1176668009-C

Print Date: 10/06/2017 3:06:40PM



Results of **SMW05-04**

Client Sample ID: **SMW05-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668010
Lab Project ID: 1176668

Collection Date: 09/18/17 14:20
Received Date: 09/18/17 16:25
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	12600	500	150	ug/L	1		09/26/17 00:50
Magnesium	3150	50.0	15.0	ug/L	1		09/26/17 00:50

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:50
Container ID: 1176668010-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	44.5	5.00	5.00	mg/L	1		09/26/17 00:50

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:50
Container ID: 1176668010-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW05-04**

Client Sample ID: **SMW05-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668010
Lab Project ID: 1176668

Collection Date: 09/18/17 14:20
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	5.46	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668010-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	2500	100	100	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668010-A

Print Date: 10/06/2017 3:06:40PM



Results of **SMW05-04**

Client Sample ID: **SMW05-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668010
Lab Project ID: 1176668

Collection Date: 09/18/17 14:20
Received Date: 09/18/17 16:25
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	0.0126 U	0.0126	0.00374	ug/L	1		10/05/17 17:03
Acenaphthylene	0.0126 U	0.0126	0.00374	ug/L	1		10/05/17 17:03
Anthracene	0.0126 U	0.0126	0.00374	ug/L	1		10/05/17 17:03
Benzo(a)Anthracene	0.0126 U	0.0126	0.00374	ug/L	1		10/05/17 17:03
Benzo[a]pyrene	0.00505 U	0.00505	0.00152	ug/L	1		10/05/17 17:03
Benzo[b]Fluoranthene	0.0126 U	0.0126	0.00374	ug/L	1		10/05/17 17:03
Benzo[g,h,i]perylene	0.0208	0.0126	0.00374	ug/L	1		10/05/17 17:03
Benzo[k]fluoranthene	0.0126 U	0.0126	0.00374	ug/L	1		10/05/17 17:03
Chrysene	0.0388	0.0126	0.00374	ug/L	1		10/05/17 17:03
Dibenzo[a,h]anthracene	0.00505 U	0.00505	0.00152	ug/L	1		10/05/17 17:03
Fluoranthene	0.0464	0.0126	0.00374	ug/L	1		10/05/17 17:03
Fluorene	0.0126 U	0.0126	0.00374	ug/L	1		10/05/17 17:03
Indeno[1,2,3-c,d] pyrene	0.0126 U	0.0126	0.00374	ug/L	1		10/05/17 17:03
Naphthalene	0.0253 U	0.0253	0.00788	ug/L	1		10/05/17 17:03
Phenanthrene	0.0505 U	0.0505	0.00374	ug/L	1		10/05/17 17:03
Pyrene	0.0505 U	0.0505	0.00374	ug/L	1		10/05/17 17:03
Surrogates							
2-Methylnaphthalene-d10 (surr)	64.7	47-106		%	1		10/05/17 17:03
Fluoranthene-d10 (surr)	46.2	24-116		%	1		10/05/17 17:03

Batch Information

Analytical Batch: XMS10452
Analytical Method: EPA 625M SIM (PAH)
Analyst: NRB
Analytical Date/Time: 10/05/17 17:03
Container ID: 1176668010-H

Prep Batch: XXX38463
Prep Method: SW3520C
Prep Date/Time: 09/19/17 08:05
Prep Initial Wt./Vol.: 990 mL
Prep Extract Vol: 1 mL

Print Date: 10/06/2017 3:06:40PM

Results of SMW05-04

Client Sample ID: **SMW05-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668010
 Lab Project ID: 1176668

Collection Date: 09/18/17 14:20
 Received Date: 09/18/17 16:25
 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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:33
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:33
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 21:33
Benzene	0.400 U	0.400	0.120	ug/L	1		09/19/17 21:33
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 21:33
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:33
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:33
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/19/17 21:33
Toluene	1.53	1.00	0.310	ug/L	1		09/19/17 21:33
Surrogates							
1,2-Dichloroethane-D4 (surr)	110	81-118		%	1		09/19/17 21:33
4-Bromofluorobenzene (surr)	109	85-114		%	1		09/19/17 21:33
Toluene-d8 (surr)	93.6	89-112		%	1		09/19/17 21:33

Batch Information

Analytical Batch: VMS17211
 Analytical Method: EPA 602/624
 Analyst: FDR
 Analytical Date/Time: 09/19/17 21:33
 Container ID: 1176668010-E

Prep Batch: VXX31335
 Prep Method: SW5030B
 Prep Date/Time: 09/19/17 00:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SMW05-04

Client Sample ID: **SMW05-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668010
Lab Project ID: 1176668

Collection Date: 09/18/17 14:20
Received Date: 09/18/17 16:25
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	56.3	3.33	1.03	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
Analytical Method: SM21 2540D
Analyst: EWW
Analytical Date/Time: 09/20/17 15:21
Container ID: 1176668010-C

Print Date: 10/06/2017 3:06:40PM



Results of **SMW07-04**

Client Sample ID: **SMW07-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668011
Lab Project ID: 1176668

Collection Date: 09/18/17 13:10
Received Date: 09/18/17 16:25
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	9970	500	150	ug/L	1		09/26/17 00:59
Magnesium	2530	50.0	15.0	ug/L	1		09/26/17 00:59

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 00:59
Container ID: 1176668011-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
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	35.3	5.00	5.00	mg/L	1		09/26/17 00:59

Batch Information

Analytical Batch: MMS9953
Analytical Method: SM21 2340B
Analyst: ACF
Analytical Date/Time: 09/26/17 00:59
Container ID: 1176668011-D

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW07-04**

Client Sample ID: **SMW07-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668011
Lab Project ID: 1176668

Collection Date: 09/18/17 13:10
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	11.7	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668011-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	2300	100	100	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668011-A

Print Date: 10/06/2017 3:06:40PM



Results of SMW07-04

Client Sample ID: **SMW07-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668011
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:10
 Received Date: 09/18/17 16:25
 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	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Acenaphthylene	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Anthracene	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Benzo(a)Anthracene	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Benzo[a]pyrene	0.00515 U	0.00515	0.00155	ug/L	1		10/05/17 17:24
Benzo[b]Fluoranthene	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Benzo[g,h,i]perylene	0.0314	0.0129	0.00381	ug/L	1		10/05/17 17:24
Benzo[k]fluoranthene	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Chrysene	0.0387	0.0129	0.00381	ug/L	1		10/05/17 17:24
Dibenzo[a,h]anthracene	0.00515 U	0.00515	0.00155	ug/L	1		10/05/17 17:24
Fluoranthene	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Fluorene	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Indeno[1,2,3-c,d] pyrene	0.0129 U	0.0129	0.00381	ug/L	1		10/05/17 17:24
Naphthalene	0.0258 U	0.0258	0.00804	ug/L	1		10/05/17 17:24
Phenanthrene	0.0515 U	0.0515	0.00381	ug/L	1		10/05/17 17:24
Pyrene	0.0753	0.0515	0.00381	ug/L	1		10/05/17 17:24
Surrogates							
2-Methylnaphthalene-d10 (surr)	47.2	47-106		%	1		10/05/17 17:24
Fluoranthene-d10 (surr)	28.7	24-116		%	1		10/05/17 17:24

Batch Information

Analytical Batch: XMS10452
 Analytical Method: EPA 625M SIM (PAH)
 Analyst: NRB
 Analytical Date/Time: 10/05/17 17:24
 Container ID: 1176668011-H

Prep Batch: XXX38463
 Prep Method: SW3520C
 Prep Date/Time: 09/19/17 08:05
 Prep Initial Wt./Vol.: 970 mL
 Prep Extract Vol: 1 mL

Print Date: 10/06/2017 3:06:40PM

Results of SMW07-04

Client Sample ID: **SMW07-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668011
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:10
 Received Date: 09/18/17 16:25
 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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:50
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:50
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 21:50
Benzene	0.400 U	0.400	0.120	ug/L	1		09/19/17 21:50
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 21:50
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:50
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:50
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/19/17 21:50
Toluene	1.00 U	1.00	0.310	ug/L	1		09/19/17 21:50
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	81-118		%	1		09/19/17 21:50
4-Bromofluorobenzene (surr)	107	85-114		%	1		09/19/17 21:50
Toluene-d8 (surr)	96.1	89-112		%	1		09/19/17 21:50

Batch Information

Analytical Batch: VMS17211
 Analytical Method: EPA 602/624
 Analyst: FDR
 Analytical Date/Time: 09/19/17 21:50
 Container ID: 1176668011-E

Prep Batch: VXX31335
 Prep Method: SW5030B
 Prep Date/Time: 09/19/17 00:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of SMW07-04

Client Sample ID: **SMW07-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668011
Lab Project ID: 1176668

Collection Date: 09/18/17 13:10
Received Date: 09/18/17 16:25
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	37.3	3.33	1.03	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
Analytical Method: SM21 2540D
Analyst: EWW
Analytical Date/Time: 09/20/17 15:21
Container ID: 1176668011-C

Print Date: 10/06/2017 3:06:40PM

Results of SMW09-04

Client Sample ID: **SMW09-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668012
 Lab Project ID: 1176668

Collection Date: 09/18/17 15:40
 Received Date: 09/18/17 16:25
 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	16500	500	150	ug/L	1		09/26/17 00:53
Magnesium	4420	50.0	15.0	ug/L	1		09/26/17 00:53

Batch Information

Analytical Batch: MMS9953
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/26/17 00:53
 Container ID: 1176668012-D

Prep Batch: MXX31080
 Prep Method: E200.2
 Prep Date/Time: 09/25/17 09:30
 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	59.4	5.00	5.00	mg/L	1		09/26/17 00:53

Batch Information

Analytical Batch: MMS9953
 Analytical Method: SM21 2340B
 Analyst: ACF
 Analytical Date/Time: 09/26/17 00:53
 Container ID: 1176668012-D

Prep Batch: MXX31080
 Prep Method: E200.2
 Prep Date/Time: 09/25/17 09:30
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of **SMW09-04**

Client Sample ID: **SMW09-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668012
Lab Project ID: 1176668

Collection Date: 09/18/17 15:40
Received Date: 09/18/17 16:25
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Micro Lab-Provisionally Certified as of 092117**

<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	4.79	2.00	2.00	mg/L	1		09/18/17 19:18

Batch Information

Analytical Batch: BOD5858
Analytical Method: SM21 5210B
Analyst: AKD
Analytical Date/Time: 09/18/17 19:18
Container ID: 1176668012-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	17200	90.9	90.9	col/100mL	1		09/18/17 18:54

Batch Information

Analytical Batch: BTF15993
Analytical Method: SM21 9222D
Analyst: K.W
Analytical Date/Time: 09/18/17 18:54
Container ID: 1176668012-A

Print Date: 10/06/2017 3:06:40PM



Results of **SMW09-04**

Client Sample ID: **SMW09-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668012
Lab Project ID: 1176668

Collection Date: 09/18/17 15:40
Received Date: 09/18/17 16:25
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	0.0162 U	0.0162	0.00481	ug/L	1		10/05/17 17:44
Acenaphthylene	0.0162 U	0.0162	0.00481	ug/L	1		10/05/17 17:44
Anthracene	0.0162 U	0.0162	0.00481	ug/L	1		10/05/17 17:44
Benzo(a)Anthracene	0.0469	0.0162	0.00481	ug/L	1		10/05/17 17:44
Benzo[a]pyrene	0.00649 U	0.00649	0.00195	ug/L	1		10/05/17 17:44
Benzo[b]Fluoranthene	0.0878	0.0162	0.00481	ug/L	1		10/05/17 17:44
Benzo[g,h,i]perylene	0.0536	0.0162	0.00481	ug/L	1		10/05/17 17:44
Benzo[k]fluoranthene	0.0281	0.0162	0.00481	ug/L	1		10/05/17 17:44
Chrysene	0.0824	0.0162	0.00481	ug/L	1		10/05/17 17:44
Dibenzo[a,h]anthracene	0.00649 U	0.00649	0.00195	ug/L	1		10/05/17 17:44
Fluoranthene	0.127	0.0162	0.00481	ug/L	1		10/05/17 17:44
Fluorene	0.0162 U	0.0162	0.00481	ug/L	1		10/05/17 17:44
Indeno[1,2,3-c,d] pyrene	0.0425	0.0162	0.00481	ug/L	1		10/05/17 17:44
Naphthalene	0.0325 U	0.0325	0.0101	ug/L	1		10/05/17 17:44
Phenanthrene	0.0649 U	0.0649	0.00481	ug/L	1		10/05/17 17:44
Pyrene	0.105	0.0649	0.00481	ug/L	1		10/05/17 17:44
Surrogates							
2-Methylnaphthalene-d10 (surr)	50.5	47-106		%	1		10/05/17 17:44
Fluoranthene-d10 (surr)	42.1	24-116		%	1		10/05/17 17:44

Batch Information

Analytical Batch: XMS10452
Analytical Method: EPA 625M SIM (PAH)
Analyst: NRB
Analytical Date/Time: 10/05/17 17:44
Container ID: 1176668012-H

Prep Batch: XXX38463
Prep Method: SW3520C
Prep Date/Time: 09/19/17 08:05
Prep Initial Wt./Vol.: 770 mL
Prep Extract Vol: 1 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SMW09-04**

Client Sample ID: **SMW09-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668012
Lab Project ID: 1176668

Collection Date: 09/18/17 15:40
Received Date: 09/18/17 16:25
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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 22:08
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 22:08
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 22:08
Benzene	0.400 U	0.400	0.120	ug/L	1		09/19/17 22:08
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 22:08
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 22:08
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/19/17 22:08
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/19/17 22:08
Toluene	1.00 U	1.00	0.310	ug/L	1		09/19/17 22:08
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	81-118		%	1		09/19/17 22:08
4-Bromofluorobenzene (surr)	108	85-114		%	1		09/19/17 22:08
Toluene-d8 (surr)	97	89-112		%	1		09/19/17 22:08

Batch Information

Analytical Batch: VMS17211
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/19/17 22:08
Container ID: 1176668012-E

Prep Batch: VXX31335
Prep Method: SW5030B
Prep Date/Time: 09/19/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/06/2017 3:06:40PM



Results of SMW09-04

Client Sample ID: **SMW09-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668012
Lab Project ID: 1176668

Collection Date: 09/18/17 15:40
Received Date: 09/18/17 16:25
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	21.5	1.67	0.517	mg/L	1		09/20/17 15:21

Batch Information

Analytical Batch: STS5654
Analytical Method: SM21 2540D
Analyst: EWW
Analytical Date/Time: 09/20/17 15:21
Container ID: 1176668012-C

Print Date: 10/06/2017 3:06:40PM



Results of Trip Blank

Client Sample ID: **Trip Blank**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668013
Lab Project ID: 1176668

Collection Date: 09/18/17 12:38
Received Date: 09/18/17 16:25
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>
1,2-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 18:38
1,3-Dichlorobenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 18:38
1,4-Dichlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 18:38
Benzene	0.400 U	0.400	0.120	ug/L	1		09/19/17 18:38
Chlorobenzene	0.500 U	0.500	0.150	ug/L	1		09/19/17 18:38
Ethylbenzene	1.00 U	1.00	0.310	ug/L	1		09/19/17 18:38
o-Xylene	1.00 U	1.00	0.310	ug/L	1		09/19/17 18:38
P & M -Xylene	2.00 U	2.00	0.620	ug/L	1		09/19/17 18:38
Toluene	1.00 U	1.00	0.310	ug/L	1		09/19/17 18:38
Surrogates							
1,2-Dichloroethane-D4 (surr)	109	81-118		%	1		09/19/17 18:38
4-Bromofluorobenzene (surr)	112	85-114		%	1		09/19/17 18:38
Toluene-d8 (surr)	94.2	89-112		%	1		09/19/17 18:38

Batch Information

Analytical Batch: VMS17211
Analytical Method: EPA 602/624
Analyst: FDR
Analytical Date/Time: 09/19/17 18:38
Container ID: 1176668013-A

Prep Batch: VXX31335
Prep Method: SW5030B
Prep Date/Time: 09/19/17 00:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 10/06/2017 3:06:40PM



Results of SWM11-04

Client Sample ID: **SWM11-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668016
Lab Project ID: 1176668

Collection Date: 09/18/17 12:38
Received Date: 09/18/17 16:25
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	6.63	1.00	0.310	ug/L	1		09/26/17 01:02

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 01:02
Container ID: 1176668016-B

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM

Results of SWM12-04

Client Sample ID: **SWM12-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668017
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
 Received Date: 09/18/17 16:25
 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	3.65	0.400	0.124	ug/L	1		09/26/17 01:05

Batch Information

Analytical Batch: MMS9953
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/26/17 01:05
 Container ID: 1176668017-B

Prep Batch: MXX31080
 Prep Method: E200.2
 Prep Date/Time: 09/25/17 09:30
 Prep Initial Wt./Vol.: 50 mL
 Prep Extract Vol: 50 mL



Results of SWM12-04 Dup

Client Sample ID: **SWM12-04 Dup**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668018
 Lab Project ID: 1176668

Collection Date: 09/18/17 13:41
 Received Date: 09/18/17 16:25
 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	8.57	1.00	0.310	ug/L	1		09/26/17 01:08

Batch Information

Analytical Batch: MMS9953
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/26/17 01:08
 Container ID: 1176668018-B

Prep Batch: MXX31080
 Prep Method: E200.2
 Prep Date/Time: 09/25/17 09:30
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of SWM03-04

Client Sample ID: **SWM03-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668019
Lab Project ID: 1176668

Collection Date: 09/18/17 13:06
Received Date: 09/18/17 16:25
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	4.91	1.00	0.310	ug/L	1		09/25/17 23:43

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/25/17 23:43
Container ID: 1176668019-B

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of SWM04-04

Client Sample ID: **SWM04-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668020
Lab Project ID: 1176668

Collection Date: 09/18/17 13:20
Received Date: 09/18/17 16:25
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	3.54	1.00	0.310	ug/L	1		09/25/17 23:46

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/25/17 23:46
Container ID: 1176668020-B

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of **SWM05-04**

Client Sample ID: **SWM05-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668021
Lab Project ID: 1176668

Collection Date: 09/18/17 14:20
Received Date: 09/18/17 16:25
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	8.57	1.00	0.310	ug/L	1		09/25/17 23:49

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/25/17 23:49
Container ID: 1176668021-B

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM

Results of SWM06-04

Client Sample ID: **SWM06-04**
 Client Project ID: **MOA Stormwater Management 5078**
 Lab Sample ID: 1176668022
 Lab Project ID: 1176668

Collection Date: 09/18/17 14:47
 Received Date: 09/18/17 16:25
 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	5.51	1.00	0.310	ug/L	1		09/25/17 23:52

Batch Information

Analytical Batch: MMS9953
 Analytical Method: EP200.8
 Analyst: ACF
 Analytical Date/Time: 09/25/17 23:52
 Container ID: 1176668022-B

Prep Batch: MXX31080
 Prep Method: E200.2
 Prep Date/Time: 09/25/17 09:30
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL



Results of **SWM07-04**

Client Sample ID: **SWM07-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668023
Lab Project ID: 1176668

Collection Date: 09/18/17 13:10
Received Date: 09/18/17 16:25
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	17.6	1.00	0.310	ug/L	1		09/25/17 23:55

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/25/17 23:55
Container ID: 1176668023-B

Prep Batch: MXX31080
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of SWM08-04

Client Sample ID: **SWM08-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668024
Lab Project ID: 1176668

Collection Date: 09/18/17 13:16
Received Date: 09/18/17 16:25
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	9.11	1.00	0.310	ug/L	1		09/26/17 02:02

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 02:02
Container ID: 1176668024-B

Prep Batch: MXX31083
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of SWM08-04 Dup

Client Sample ID: **SWM08-04 Dup**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668025
Lab Project ID: 1176668

Collection Date: 09/18/17 13:16
Received Date: 09/18/17 16:25
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	9.03	1.00	0.310	ug/L	1		09/26/17 02:05

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 02:05
Container ID: 1176668025-B

Prep Batch: MXX31083
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of SWM09-04

Client Sample ID: **SWM09-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668026
Lab Project ID: 1176668

Collection Date: 09/18/17 15:40
Received Date: 09/18/17 16:25
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	4.04	1.00	0.310	ug/L	1		09/26/17 02:08

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 02:08
Container ID: 1176668026-B

Prep Batch: MXX31083
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM



Results of SWM10-04

Client Sample ID: **SWM10-04**
Client Project ID: **MOA Stormwater Management 5078**
Lab Sample ID: 1176668027
Lab Project ID: 1176668

Collection Date: 09/18/17 15:51
Received Date: 09/18/17 16:25
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		09/26/17 03:47

Batch Information

Analytical Batch: MMS9953
Analytical Method: EP200.8
Analyst: ACF
Analytical Date/Time: 09/26/17 03:47
Container ID: 1176668027-B

Prep Batch: MXX31083
Prep Method: E200.2
Prep Date/Time: 09/25/17 09:30
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Print Date: 10/06/2017 3:06:40PM

Method Blank

Blank ID: MB for HBN 1768732 [BOD/5858]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1413967

QC for Samples:

1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

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: BOD5858

Analytical Method: SM21 5210B

Instrument:

Analyst: AKD

Analytical Date/Time: 9/18/2017 5:02:00PM

Print Date: 10/06/2017 3:06:45PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176668 [BOD5858]

Blank Spike Lab ID: 1413968

Date Analyzed: 09/18/2017 17:02

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

Results by SM21 5210B

Parameter	Blank Spike (mg/L)			CL
	Spike	Result	Rec (%)	
Biochemical Oxygen Demand	198	225	114	(84.6-115.4

Batch Information

Analytical Batch: **BOD5858**

Analytical Method: **SM21 5210B**

Instrument:

Analyst: **AKD**



Method Blank

Blank ID: MB for HBN 1768729 [BTF/15993]
Blank Lab ID: 1413959

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

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: BTF15993
Analytical Method: SM21 9222D
Instrument:
Analyst: K.W
Analytical Date/Time: 9/18/2017 6:54:00PM

Print Date: 10/06/2017 3:06:49PM

Method Blank

Blank ID: MB for HBN 1769053 [MXX/31080]
 Blank Lab ID: 1415527

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008, 1176668009,
 1176668010, 1176668011, 1176668012, 1176668016, 1176668017, 1176668018, 1176668019, 1176668020, 1176668021,
 1176668022, 1176668023

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: MMS9953
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/26/2017 12:07:56AM

Prep Batch: MXX31080
 Prep Method: E200.2
 Prep Date/Time: 9/25/2017 9:30:23AM
 Prep Initial Wt./Vol.: 20 mL
 Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176668 [MXX31080]
 Blank Spike Lab ID: 1415528
 Date Analyzed: 09/26/2017 00:10

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007,
 1176668008, 1176668009, 1176668010, 1176668011, 1176668012, 1176668016, 1176668017,
 1176668018, 1176668019, 1176668020, 1176668021, 1176668022, 1176668023

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Calcium	10000	9820	98	(85-115)
Copper	1000	1010	101	(85-115)
Magnesium	10000	10300	103	(85-115)

Batch Information

Analytical Batch: **MMS9953**
 Analytical Method: **EP200.8**
 Instrument: **Perkin Elmer Nexlon P5**
 Analyst: **ACF**

Prep Batch: **MXX31080**
 Prep Method: **E200.2**
 Prep Date/Time: **09/25/2017 09:30**
 Spike Init Wt./Vol.: 10000 ug/L Extract Vol: 50 mL
 Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1415529
 MS Sample ID: 1415530 MS
 MSD Sample ID:

Analysis Date: 09/26/2017 0:13
 Analysis Date: 09/26/2017 0:16
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007,
 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

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	7980	10000	18300	103				70-130		
Copper	11.4	1000	1050	104				70-130		
Magnesium	1350	10000	11900	105				70-130		

Batch Information

Analytical Batch: MMS9953
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/26/2017 12:16:57AM

Prep Batch: MXX31080
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/25/2017 9:30:23AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Matrix Spike Summary

Original Sample ID: 1415630
 MS Sample ID: 1415631 MS
 MSD Sample ID:

Analysis Date: 09/26/2017 0:53
 Analysis Date: 09/26/2017 0:56
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008,
 1176668009, 1176668010, 1176668011, 1176668012, 1176668016, 1176668017, 1176668018,
 1176668019, 1176668020, 1176668021, 1176668022, 1176668023

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	16500	10000	25800	93				70-130		
Copper	14.3	1000	1010	100				70-130		
Magnesium	4420	10000	14700	102				70-130		

Batch Information

Analytical Batch: MMS9953
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/26/2017 12:56:33AM

Prep Batch: MXX31080
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/25/2017 9:30:23AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1769058 [MXX/31083]
Blank Lab ID: 1415554

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1176668024, 1176668025, 1176668026, 1176668027

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: MMS9953
Analytical Method: EP200.8
Instrument: Perkin Elmer Nexlon P5
Analyst: ACF
Analytical Date/Time: 9/26/2017 1:26:07AM

Prep Batch: MXX31083
Prep Method: E200.2
Prep Date/Time: 9/25/2017 9:30:04AM
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 50 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176668 [MXX31083]

Blank Spike Lab ID: 1415555

Date Analyzed: 09/26/2017 01:29

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176668024, 1176668025, 1176668026, 1176668027

Results by EP200.8

Parameter	Blank Spike (ug/L)			CL
	Spike	Result	Rec (%)	
Copper	1000	1050	105	(85-115)

Batch Information

Analytical Batch: **MMS9953**

Analytical Method: **EP200.8**

Instrument: **Perkin Elmer Nexlon P5**

Analyst: **ACF**

Prep Batch: **MXX31083**

Prep Method: **E200.2**

Prep Date/Time: **09/25/2017 09:30**

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

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1415556
 MS Sample ID: 1415557 MS
 MSD Sample ID:

Analysis Date: 09/26/2017 1:32
 Analysis Date: 09/26/2017 1:35
 Analysis Date:
 Matrix: Drinking Water

QC for Samples: 1176668024, 1176668025, 1176668026, 1176668027

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	0.917J	1000	1030	103				70-130		

Batch Information

Analytical Batch: MMS9953
 Analytical Method: EP200.8
 Instrument: Perkin Elmer Nexlon P5
 Analyst: ACF
 Analytical Date/Time: 9/26/2017 1:35:08AM

Prep Batch: MXX31083
 Prep Method: DW Digest for Metals on ICP-MS
 Prep Date/Time: 9/25/2017 9:30:04AM
 Prep Initial Wt./Vol.: 20.00mL
 Prep Extract Vol: 50.00mL

Method Blank

Blank ID: MB for HBN 1768855 [STS/5654]

Matrix: Water (Surface, Eff., Ground)

Blank Lab ID: 1414565

QC for Samples:

1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

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: STS5654

Analytical Method: SM21 2540D

Instrument:

Analyst: EWW

Analytical Date/Time: 9/20/2017 3:21:57PM

Print Date: 10/06/2017 3:07:01PM

Duplicate Sample Summary

Original Sample ID: 1176641001

Duplicate Sample ID: 1414568

QC for Samples:

1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

Analysis Date: 09/20/2017 15:21

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	55.2	78.3	mg/L	34.50*	(< 5)

Batch Information

Analytical Batch: STS5654

Analytical Method: SM21 2540D

Instrument:

Analyst: EWW

Duplicate Sample Summary

Original Sample ID: 1178396001

Duplicate Sample ID: 1414569

QC for Samples:

1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

Analysis Date: 09/20/2017 15:21

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	ND	1.11J	mg/L	0.00	(< 5)

Batch Information

Analytical Batch: STS5654

Analytical Method: SM21 2540D

Instrument:

Analyst: EWW

Print Date: 10/06/2017 3:07:02PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176668 [STS5654]
 Blank Spike Lab ID: 1414566
 Date Analyzed: 09/20/2017 15:21

Spike Duplicate ID: LCSD for HBN 1176668 [STS5654]
 Spike Duplicate Lab ID: 1414567
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176668001, 1176668002, 1176668003, 1176668004, 1176668005, 1176668006, 1176668007, 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

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	50	49.6	99	50	48.1	96	(75-125)	3.10	(< 5)

Batch Information

Analytical Batch: **STS5654**
 Analytical Method: **SM21 2540D**
 Instrument:
 Analyst: **EWV**

Method Blank

Blank ID: MB for HBN 1768871 [VXX/31335]
 Blank Lab ID: 1414622

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1176668008, 1176668009, 1176668010, 1176668011, 1176668012, 1176668013

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Chlorobenzene	0.250U	0.500	0.150	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)	109	81-118		%
4-Bromofluorobenzene (surr)	110	85-114		%
Toluene-d8 (surr)	97	89-112		%

Batch Information

Analytical Batch: VMS17211
 Analytical Method: EPA 602/624
 Instrument: VSA Agilent GC/MS 7890B/5977A
 Analyst: FDR
 Analytical Date/Time: 9/19/2017 2:07:00PM

Prep Batch: VXX31335
 Prep Method: SW5030B
 Prep Date/Time: 9/19/2017 12:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176668 [VXX31335]
 Blank Spike Lab ID: 1414623
 Date Analyzed: 09/19/2017 14:47

Spike Duplicate ID: LCSD for HBN 1176668 [VXX31335]
 Spike Duplicate Lab ID: 1414624
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176668008, 1176668009, 1176668010, 1176668011, 1176668012, 1176668013

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2-Dichlorobenzene	30	29.0	97	30	29.6	99	(80-119)	2.20	(< 20)
1,3-Dichlorobenzene	30	29.3	98	30	29.9	100	(80-119)	1.80	(< 20)
1,4-Dichlorobenzene	30	29.4	98	30	30.1	100	(79-118)	2.50	(< 20)
Benzene	30	29.8	99	30	30.5	102	(79-120)	2.30	(< 20)
Chlorobenzene	30	28.2	94	30	28.9	96	(82-118)	2.30	(< 20)
Ethylbenzene	30	28.6	95	30	30.6	102	(79-121)	6.80	(< 20)
o-Xylene	30	29.6	99	30	31.3	104	(78-122)	5.60	(< 20)
P & M -Xylene	60	57.7	96	60	63.1	105	(80-121)	9.00	(< 20)
Toluene	30	27.7	92	30	27.2	91	(80-121)	1.80	(< 20)

Surrogates

1,2-Dichloroethane-D4 (surr)	30	99.3	99	30	103	103	(81-118)	3.20	
4-Bromofluorobenzene (surr)	30	95.1	95	30	97.4	97	(85-114)	2.50	
Toluene-d8 (surr)	30	99.9	100	30	96.5	97	(89-112)	3.40	

Batch Information

Analytical Batch: **VMS17211**
 Analytical Method: **EPA 602/624**
 Instrument: **VSA Agilent GC/MS 7890B/5977A**
 Analyst: **FDR**

Prep Batch: **VXX31335**
 Prep Method: **SW5030B**
 Prep Date/Time: **09/19/2017 00:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL



Matrix Spike Summary

Original Sample ID: 1414629
 MS Sample ID: 1414630 MS
 MSD Sample ID: 1414631 MSD

Analysis Date: 09/19/2017 20:58
 Analysis Date: 09/20/2017 0:28
 Analysis Date: 09/20/2017 0:45
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176668008, 1176668009, 1176668010, 1176668011, 1176668012, 1176668013

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 (%)			
1,2-Dichlorobenzene	0.500U	30.0	29.2	97	30.0	29.0	97	80-119	0.69	(< 20)
1,3-Dichlorobenzene	0.500U	30.0	29.4	98	30.0	29.1	97	80-119	1.20	(< 20)
1,4-Dichlorobenzene	0.250U	30.0	29.7	99	30.0	29.6	99	79-118	0.24	(< 20)
Benzene	0.200U	30.0	30.1	100	30.0	29.9	100	79-120	0.63	(< 20)
Chlorobenzene	0.250U	30.0	28.7	96	30.0	28.9	96	82-118	0.83	(< 20)
Ethylbenzene	0.500U	30.0	28.9	96	30.0	29.0	97	79-121	0.48	(< 20)
o-Xylene	0.500U	30.0	29.5	98	30.0	29.5	98	78-122	0.03	(< 20)
P & M -Xylene	1.00U	60.0	58.5	98	60.0	58.0	97	80-121	0.91	(< 20)
Toluene	0.440J	30.0	28.2	92	30.0	28.4	93	80-121	0.88	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.6	99	30.0	29.1	97	81-118	1.50	
4-Bromofluorobenzene (surr)		30.0	29.2	97	30.0	29.0	97	85-114	0.55	
Toluene-d8 (surr)		30.0	29.9	100	30.0	30.3	101	89-112	1.50	

Batch Information

Analytical Batch: VMS17211
 Analytical Method: EPA 602/624
 Instrument: VSA Agilent GC/MS 7890B/5977A
 Analyst: FDR
 Analytical Date/Time: 9/20/2017 12:28:00AM

Prep Batch: VXX31335
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 9/19/2017 12:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Print Date: 10/06/2017 3:07:09PM

Billable Matrix Spike Summary

Original Sample ID: 1176668008
 MS Sample ID: 1176668014 BMS
 MSD Sample ID: 1176668015 BMSD

Analysis Date: 09/19/2017 20:58
 Analysis Date: 09/20/2017 0:28
 Analysis Date: 09/20/2017 0:45
 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 (%)			
1,2-Dichlorobenzene	1.00U	30.0	29.2	97	30.0	29.0	97	80-119	0.69	(< 20)
1,3-Dichlorobenzene	1.00U	30.0	29.4	98	30.0	29.1	97	80-119	1.20	(< 20)
1,4-Dichlorobenzene	0.500U	30.0	29.7	99	30.0	29.6	99	79-118	0.24	(< 20)
Benzene	0.400U	30.0	30.1	100	30.0	29.9	100	79-120	0.63	(< 20)
Chlorobenzene	0.500U	30.0	28.7	96	30.0	28.9	96	82-118	0.83	(< 20)
Ethylbenzene	1.00U	30.0	28.9	96	30.0	29.0	97	79-121	0.48	(< 20)
o-Xylene	1.00U	30.0	29.5	98	30.0	29.5	98	78-122	0.03	(< 20)
P & M -Xylene	2.00U	60.0	58.5	98	60.0	58.0	97	80-121	0.91	(< 20)
Toluene	1.00U	30.0	28.2	94	30.0	28.4	95	80-121	0.88	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.6	99	30.0	29.1	97	81-118	1.50	
4-Bromofluorobenzene (surr)		30.0	29.2	97	30.0	29.0	97	85-114	0.55	
Toluene-d8 (surr)		30.0	29.9	100	30.0	30.3	101	89-112	1.50	

Batch Information

Analytical Batch: VMS17211
 Analytical Method: EPA 602/624
 Instrument: VSA Agilent GC/MS 7890B/5977A
 Analyst: FDR
 Analytical Date/Time: 9/20/2017 12:28:00AM

Prep Batch: VXX31335
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 9/19/2017 12:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Method Blank

Blank ID: MB for HBN 1768738 [XXX/38463]
 Blank Lab ID: 1414015

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

Results by EPA 625M SIM (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.00625U	0.0125	0.00370	ug/L
Acenaphthylene	0.00625U	0.0125	0.00370	ug/L
Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo(a)Anthracene	0.00625U	0.0125	0.00370	ug/L
Benzo[a]pyrene	0.00250U	0.00500	0.00150	ug/L
Benzo[b]Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Benzo[g,h,i]perylene	0.00625U	0.0125	0.00370	ug/L
Benzo[k]fluoranthene	0.00625U	0.0125	0.00370	ug/L
Chrysene	0.00625U	0.0125	0.00370	ug/L
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	ug/L
Fluoranthene	0.00625U	0.0125	0.00370	ug/L
Fluorene	0.00625U	0.0125	0.00370	ug/L
Indeno[1,2,3-c,d] pyrene	0.00625U	0.0125	0.00370	ug/L
Naphthalene	0.0125U	0.0250	0.00780	ug/L
Phenanthrene	0.0250U	0.0500	0.00370	ug/L
Pyrene	0.0250U	0.0500	0.00370	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	80.5	47-106		%
Fluoranthene-d10 (surr)	81.2	24-116		%

Batch Information

Analytical Batch: XMS10449
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: NRB
 Analytical Date/Time: 10/4/2017 10:25:00PM

Prep Batch: XXX38463
 Prep Method: SW3520C
 Prep Date/Time: 9/19/2017 8:05:27AM
 Prep Initial Wt./Vol.: 1000 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1176668 [XXX38463]
 Blank Spike Lab ID: 1414016
 Date Analyzed: 10/04/2017 22:46

Spike Duplicate ID: LCSD for HBN 1176668 [XXX38463]
 Spike Duplicate Lab ID: 1414017
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1176668008, 1176668009, 1176668010, 1176668011, 1176668012

Results by EPA 625M SIM (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.5	0.388	78	0.5	0.395	79	(48-114)	1.60	(< 20)
Acenaphthylene	0.5	0.399	80	0.5	0.400	80	(35-121)	0.41	(< 20)
Anthracene	0.5	0.411	82	0.5	0.401	80	(53-119)	2.60	(< 20)
Benzo(a)Anthracene	0.5	0.425	85	0.5	0.417	83	(59-120)	1.90	(< 20)
Benzo[a]pyrene	0.5	0.375	75	0.5	0.372	74	(53-120)	0.86	(< 20)
Benzo[b]Fluoranthene	0.5	0.404	81	0.5	0.402	80	(53-126)	0.51	(< 20)
Benzo[g,h,i]perylene	0.5	0.369	74	0.5	0.382	76	(44-128)	3.40	(< 20)
Benzo[k]fluoranthene	0.5	0.417	83	0.5	0.424	85	(54-125)	1.60	(< 20)
Chrysene	0.5	0.437	87	0.5	0.432	86	(57-120)	1.20	(< 20)
Dibenzo[a,h]anthracene	0.5	0.348	70	0.5	0.366	73	(44-131)	5.20	(< 20)
Fluoranthene	0.5	0.422	84	0.5	0.422	84	(58-120)	0.05	(< 20)
Fluorene	0.5	0.394	79	0.5	0.399	80	(50-118)	1.30	(< 20)
Indeno[1,2,3-c,d] pyrene	0.5	0.373	75	0.5	0.384	77	(48-130)	3.10	(< 20)
Naphthalene	0.5	0.401	80	0.5	0.408	82	(43-114)	1.70	(< 20)
Phenanthrene	0.5	0.420	84	0.5	0.427	86	(53-115)	1.70	(< 20)
Pyrene	0.5	0.443	89	0.5	0.438	88	(53-121)	1.10	(< 20)

Surrogates

2-Methylnaphthalene-d10 (surr)	0.5	73.5	74	0.5	75.6	76	(47-106)	2.80	
Fluoranthene-d10 (surr)	0.5	74	74	0.5	76.5	77	(24-116)	3.30	

Batch Information

Analytical Batch: XMS10449
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: NRB

Prep Batch: XXX38463
 Prep Method: SW3520C
 Prep Date/Time: 09/19/2017 08:05
 Spike Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 0.5 ug/L Extract Vol: 1 mL

Billable Matrix Spike Summary

Original Sample ID: 1176668008
 MS Sample ID: 1176668014 BMS
 MSD Sample ID: 1176668015 BMSD

Analysis Date: 10/05/2017 16:22
 Analysis Date: 10/05/2017 18:05
 Analysis Date: 10/05/2017 18:25
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH)

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0132U	0.526	.278	53	0.581	0.300	52	48-114	7.60	(< 20)
Acenaphthylene	0.0132U	0.526	.317	60	0.581	0.340	59	35-121	7.10	(< 20)
Anthracene	0.0132U	0.526	.239	45 *	0.581	0.273	47 *	53-119	13.50	(< 20)
Benzo(a)Anthracene	0.0132U	0.526	.0926	18 *	0.581	0.120	21 *	59-120	26.00	* (< 20)
Benzo[a]pyrene	0.00526U	0.526	.0527	10 *	0.581	0.0723	12 *	53-120	31.40	* (< 20)
Benzo[b]Fluoranthene	0.0132U	0.526	.0648	12 *	0.581	0.0879	15 *	53-126	30.30	* (< 20)
Benzo[g,h,i]perylene	0.0157	0.526	.0466	6 *	0.581	0.0636	8 *	44-128	30.70	* (< 20)
Benzo[k]fluoranthene	0.0132U	0.526	.0533	10 *	0.581	0.0770	13 *	54-125	36.30	* (< 20)
Chrysene	0.0264	0.526	.114	17 *	0.581	0.145	20 *	57-120	24.10	* (< 20)
Dibenzo[a,h]anthracene	0.00526U	0.526	.0317	6 *	0.581	0.0459	8 *	44-131	36.60	* (< 20)
Fluoranthene	0.0132U	0.526	.181	34 *	0.581	0.214	37 *	58-120	17.00	(< 20)
Fluorene	0.0132U	0.526	.283	54	0.581	0.314	54	50-118	10.30	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0132U	0.526	.0359	7 *	0.581	0.0512	9 *	48-130	35.30	* (< 20)
Naphthalene	0.0263U	0.526	.304	58	0.581	0.324	56	43-114	6.10	(< 20)
Phenanthrene	0.0526U	0.526	.288	55	0.581	0.324	56	53-115	11.70	(< 20)
Pyrene	0.0526U	0.526	.197	38 *	0.581	0.242	42 *	53-121	20.30	* (< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		0.526	.276	53	0.581	0.301	52	47-106	8.50	
Fluoranthene-d10 (surr)		0.526	.155	30	0.581	0.196	34	24-116	23.00	

Batch Information

Analytical Batch: XMS10452
 Analytical Method: EPA 625M SIM (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: NRB
 Analytical Date/Time: 10/5/2017 6:05:00PM

Prep Batch: XXX38463
 Prep Method: Liquid/Liquid Extraction for 625 SIMS
 Prep Date/Time: 9/19/2017 8:05:27AM
 Prep Initial Wt./Vol.: 950.00mL
 Prep Extract Vol: 1.00mL

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1176668



Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-04	348-1	9/15/17	1238	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	①A	
SWM12-04	1454-1		1341	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑧A	
SWM12-04 Dup	1454-1		1341	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑨A	
SWM03-04	1224-1		1306	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	②A	
SWM04-04	1224-2		1320	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	③A	
SWM05-04	207-1		1420	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑩A	
SWM06-04	314-22		1447	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	④A	
SWM07-04	484-1		1316	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑪A	
SWM08-04	86-1		1316	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑤A	
SWM08-04 Dup	86-1		1316	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑥A	
SWM09-04	499-1		1540	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑬A	
SWM10-04	525-2	9/18/17	1551	Samp	Fecal (SM 9222D)	125-ml sterile	<10 °C	1	⑦A	

Project: **MOA Stormwater Management** Matrix: **Water** Project #: **5078**

Note: Samples contain sodium thiosulfate for dechlorination

Complete by: **2 weeks**

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By:	Transporter:	Received By:	Date/Time:
AS	hnm	mm mm	9/18/17 1644
Relinquished By:	Transporter:	Received By:	Date/Time:
			9/18/17 16:25

Cooler TBs: #1: 3.6 #104) #2: 6.7 #1020 #3: 5.6 #1024 #4: 9.6 #1090 CS: Absent HD


Chain of Custody Record

To: SGS Environmental Services, Inc.
 2100 West Potter Drive
 Anchorage, AK 99518
 (907) 562-2343
 (907) 561-5301 Fax
 Contact: Forest Taylor

From: Kinnetic Laboratories, Inc
 704 West 2nd Avenue
 Anchorage, AK 99501
 (907) 276-6178
 (907) 278-6881 Fax
 Contact: Mark Savoie

SGS Quote No. 337618
Bill To:
 Municipality of Anchorage
 Attn: Kristy Bischofberger
 bischofbergerKL.ci.anchorage.ak.us
 (907) 343-8058

1176668



Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078

Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-04	348-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	10B	
SWM12-04	1454-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	8B	
SWM12-04 Dup	1454-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	9B	
SWM03-04	1224-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	2B	
SWM04-04	1224-2	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	3B	
SWM05-04	207-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	10B	
SWM06-04	314-22	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	4B	
SWM07-04	484-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	11B	
SWM08-04	86-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	5B	
SWM08-04 Dup	86-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	6B	
SWM09-04	499-1	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	12B	
SWM10-04	525-2	9/18/17		Samp	BOD (SM 5210B)	1-L HDPE	≤ 6 °C	1	7B	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By:	Date/Time:	Transporter:	Received By:	Date/Time:
<i>[Signature]</i>	9/18/17 1644	hard	<i>[Signature]</i>	9/18/17 16:25
Relinquished By:	Date/Time:	Transporter:	Received By:	Date/Time:
			<i>[Signature]</i>	9/18/17 16:25

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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1176668



Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-04	348-1	9/17/17		Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	① C	
SWM12-04	1454-1		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑧ C	
SWM12-04 Dup	1454-1		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑨ C	
SWM03-04	1224-1		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	② C	
SWM04-04	1224-2		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	③ C	
SWM05-04	207-1		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑩ C	
SWM06-04	314-22		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	④ C	
SWM07-04	484-1		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑪ C	
SWM08-04	86-1		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑤ C	
SWM08-04 Dup	86-1		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑥ C	
SWM09-04	499-1		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑫ C	
SWM10-04	525-2		1:00	Samp	TSS (SM 2540D)	1-L HDPE	≤ 6 °C	1	⑦ C	

Project: MOA Stormwater Management

Matrix: Water

Complete by: 2 weeks

Project #: 5078

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLL. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By:	Transporter	Received By:
AK	AKA	AKA
9/18/17 1644	9/18/17 1644	9/18/17 6:25
AK	AKA	AKA
9/18/17 1644	9/18/17 1644	9/18/17 6:25

1176668



Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
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Project: MOA Stormwater Management Matrix: Water Project #: 5078

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-04	348-1	9/17/11	1235	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	1D	
SWM12-04	1454-1		1341	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	2D	
SWM12-04 Dup	1454-1		1341	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	4D	
SWM03-04	1224-1		1306	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	2D	
SWM04-04	1224-2		1320	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	3D	
SWM05-04	207-1		1420	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	10D	
SWM06-04	314-22		1447	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	4D	
SWM07-04	484-1		1310	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	11D	
SWM08-04	86-1		1316	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	5D	
SWM08-04 Dup	86-1		1316	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	6D	
SWM09-04	499-1		1540	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	12D	
SWM10-04	525-2		1551	Samp	Total Hardness (SM 2340B)	250-ml HDPE	HNO3 ≤ 6 °C	1	7D	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLL. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Samples and Relinquished By: <i>AK</i>	Date/Time: 9/18/17 1644	Transporter: hand	Received By: [Signature]	Date/Time: 9/18/17 16:25
Relinquished By: [Signature]	Date/Time: 9/18/17 1644	Transporter: hand	Received By: [Signature]	Date/Time: 9/18/17 16:25

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerKL.ci.anchorage.ak.us (907) 343-8058	1176668 

Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078
Complete by: 2 weeks


Sample ID	Offfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM12-04	1454-1	9/18/17	1341	Samp/MS/MSD	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	9	8E-G (19) (S) (A) (C)	
SWM12-04 Dup	1454-1		1341	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	9E-G	
SWM05-04	207-1		1420	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	10E-G	
SWM07-04	484-1		1310	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	11E-G	
SWM09-04	499-1	9/18/17	1540	Samp	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	12E-G	
Trip Blank	N/A	N/A	N/A	TB	TAH (EPA 602/624)	40-ml VOA	HCl, ≤6°C	3	13A-C	
SWM 12-04	1454-1	9/18/17	1341	Samp	TAQH (625)	1L	NONE	2	8H-I (19) (S) (A) (E)	
SWM 12-04d	1454-1		1341					2	9H-I	
SWM 05-04	207-1		1420					2	10H-I	
SWM 07-04	484-1		1310					2	11H-I	
SWM 09-04	499-1	9/18/17	1540	Samp	TAQH (625)	1L	NONE	2	12H-I	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments:

Sampled and Relinquished By:	Transporter:	Received By:	Date/Time:
ge 94 AAG	hard	mm	9/18/17 1649
Relinquished By:	Transporter:	Received By:	Date/Time:
8		mm	9/18/17 1645

Chain of Custody Record

To: SGS Environmental Services, Inc. 2100 West Potter Drive Anchorage, AK 99518 (907) 562-2343 (907) 561-5301 Fax Contact: Forest Taylor	From: Kinnetic Laboratories, Inc 704 West 2nd Avenue Anchorage, AK 99501 (907) 276-6178 (907) 278-6881 Fax Contact: Mark Savoie
SGS Quote No. 337618 Bill To: Municipality of Anchorage Attn: Kristy Bischofberger bischofbergerkl.ci.anchorage.ak.us (907) 343-8058	1176668 

Project: MOA Stormwater Management **Matrix:** Water **Project #:** 5078
Complete by: 2 weeks

Sample ID	Outfall ID	Sample Date	Sample Time	Sample Type	Analysis	Container	Pres	No. of Bottles	Lab ID	Condition Upon Receipt
SWM11-04	348-1	9/15/17	1738	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	16 A-B	
SWM12-04	1454-1		1341	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	17 A-B	
SWM12-04 Dup	1454-1		1341	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	18 A-B	
SWM03-04	1224-1		1326	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	19 A-B	
SWM04-04	1224-2		1326	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	20 A-B	
SWM05-04	207-1		1476	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	21 A-B	
SWM06-04	314-22		1443	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	22 A-B	
SWM07-04	484-1		1316	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	23 A-B	
SWM08-04	86-1		1316	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	24 A-B	
SWM08-04 Dup	86-1		1316	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	25 A-B	
SWM09-04	499-1		1550	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	26 A-B	
SWM10-04	525-2		1551	Samp	Diss. Cu (EPA 200.8)	250-ml HDPE	≤ 6 °C	1	27 A-B	

Data Report MUST include the following: Sample ID, Analytical Method, Detection Limit, Date of Extraction if applicable, Date of Analysis, Analytical Results and Signature of QA Reviewer. Submit all data in digital formats to KLI. Email digital reports to msavoie@kinneticlabs.net. All times on this sheet are military time.

Special Instructions/Comments: Dissolved Copper must be Filtered & Preserved at Lab

Sampled and Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:
<i>AK</i>	9/18/17 1644	hnd	<i>mm</i>	9/18/17 1625
Relinquished By:	Date/Time:	Transporter	Received By:	Date/Time:



e-Sample Receipt Form

SGS Workorder #:

1176668



1 1 7 6 6 6 8

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements	<input checked="" type="checkbox"/>	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	
<input checked="" type="checkbox"/> **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 @ 3.6 °C Therm. ID: D41
	<input type="checkbox"/> no	Cooler ID: 2 @ 6.7 °C Therm. ID: D20
	<input checked="" type="checkbox"/> yes	Cooler ID: 3 @ 5.6 °C Therm. ID: D24
	<input type="checkbox"/> no	Cooler ID: 4 @ 9.6 °C Therm. ID: D40
	<input type="checkbox"/> n/a	Cooler ID: @ °C Therm. ID:
*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	
If samples received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
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.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	<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 type="checkbox"/> no	Sample 10G has a bubble greater than 6 mm. The trip blank, Sample 13, was received in cooler 3 with sample 11. Samples 8, 9, 10, 12, 14, and 15 were all received in different coolers.
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	<input type="checkbox"/> no	
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 SWM12-04 will have a PS, MS, and MSD for both TAH and TAqH per FT.		



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>
1176668001-A	Na2S2O3 for Chlorine Redu	OK	1176668009-F	HCL to pH < 2	OK
1176668001-B	No Preservative Required	OK	1176668009-G	HCL to pH < 2	OK
1176668001-C	No Preservative Required	OK	1176668009-H	No Preservative Required	OK
1176668001-D	HNO3 to pH < 2	OK	1176668009-I	No Preservative Required	OK
1176668002-A	Na2S2O3 for Chlorine Redu	OK	1176668010-A	Na2S2O3 for Chlorine Redu	OK
1176668002-B	No Preservative Required	OK	1176668010-B	No Preservative Required	OK
1176668002-C	No Preservative Required	OK	1176668010-C	No Preservative Required	OK
1176668002-D	HNO3 to pH < 2	OK	1176668010-D	HNO3 to pH < 2	OK
1176668003-A	Na2S2O3 for Chlorine Redu	OK	1176668010-E	HCL to pH < 2	OK
1176668003-B	No Preservative Required	OK	1176668010-F	HCL to pH < 2	OK
1176668003-C	No Preservative Required	OK	1176668010-G	HCL to pH < 2	BU
1176668003-D	HNO3 to pH < 2	OK	1176668010-H	No Preservative Required	OK
1176668004-A	Na2S2O3 for Chlorine Redu	OK	1176668010-I	No Preservative Required	OK
1176668004-B	No Preservative Required	OK	1176668011-A	Na2S2O3 for Chlorine Redu	OK
1176668004-C	No Preservative Required	OK	1176668011-B	No Preservative Required	OK
1176668004-D	HNO3 to pH < 2	OK	1176668011-C	No Preservative Required	OK
1176668005-A	Na2S2O3 for Chlorine Redu	OK	1176668011-D	HNO3 to pH < 2	OK
1176668005-B	No Preservative Required	OK	1176668011-E	HCL to pH < 2	OK
1176668005-C	No Preservative Required	OK	1176668011-F	HCL to pH < 2	OK
1176668005-D	HNO3 to pH < 2	OK	1176668011-G	HCL to pH < 2	OK
1176668006-A	Na2S2O3 for Chlorine Redu	OK	1176668011-H	No Preservative Required	OK
1176668006-B	No Preservative Required	OK	1176668011-I	No Preservative Required	OK
1176668006-C	No Preservative Required	OK	1176668012-A	Na2S2O3 for Chlorine Redu	OK
1176668006-D	HNO3 to pH < 2	OK	1176668012-B	No Preservative Required	OK
1176668007-A	Na2S2O3 for Chlorine Redu	OK	1176668012-C	No Preservative Required	OK
1176668007-B	No Preservative Required	OK	1176668012-D	HNO3 to pH < 2	OK
1176668007-C	No Preservative Required	OK	1176668012-E	HCL to pH < 2	OK
1176668007-D	HNO3 to pH < 2	OK	1176668012-F	HCL to pH < 2	OK
1176668008-A	Na2S2O3 for Chlorine Redu	OK	1176668012-G	HCL to pH < 2	OK
1176668008-B	No Preservative Required	OK	1176668012-H	No Preservative Required	OK
1176668008-C	No Preservative Required	OK	1176668012-I	No Preservative Required	OK
1176668008-D	HNO3 to pH < 2	OK	1176668013-A	HCL to pH < 2	OK
1176668008-E	HCL to pH < 2	OK	1176668013-B	HCL to pH < 2	OK
1176668008-F	HCL to pH < 2	OK	1176668013-C	HCL to pH < 2	OK
1176668008-G	HCL to pH < 2	OK	1176668014-A	HCL to pH < 2	OK
1176668008-H	No Preservative Required	OK	1176668014-B	HCL to pH < 2	OK
1176668008-I	No Preservative Required	OK	1176668014-C	HCL to pH < 2	OK
1176668009-A	Na2S2O3 for Chlorine Redu	OK	1176668014-D	No Preservative Required	OK
1176668009-B	No Preservative Required	OK	1176668014-E	No Preservative Required	OK
1176668009-C	No Preservative Required	OK	1176668015-A	HCL to pH < 2	OK
1176668009-D	HNO3 to pH < 2	OK	1176668015-B	HCL to pH < 2	OK
1176668009-E	HCL to pH < 2	OK	1176668015-C	HCL to pH < 2	OK

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1176668015-D	No Preservative Required	OK			
1176668015-E	No Preservative Required	OK			
1176668016-A	No Preservative Required	OK			
1176668016-B	HNO3 to pH < 2	PA			
1176668017-A	No Preservative Required	OK			
1176668017-B	HNO3 to pH < 2	PA			
1176668018-A	No Preservative Required	OK			
1176668018-B	HNO3 to pH < 2	PA			
1176668019-A	No Preservative Required	OK			
1176668019-B	HNO3 to pH < 2	PA			
1176668020-A	No Preservative Required	OK			
1176668020-B	HNO3 to pH < 2	PA			
1176668021-A	No Preservative Required	OK			
1176668021-B	HNO3 to pH < 2	PA			
1176668022-A	No Preservative Required	OK			
1176668022-B	HNO3 to pH < 2	PA			
1176668023-A	No Preservative Required	OK			
1176668023-B	HNO3 to pH < 2	PA			
1176668024-A	No Preservative Required	OK			
1176668024-B	HNO3 to pH < 2	PA			
1176668025-A	No Preservative Required	OK			
1176668025-B	HNO3 to pH < 2	PA			
1176668026-A	No Preservative Required	OK			
1176668026-B	HNO3 to pH < 2	PA			
1176668027-A	No Preservative Required	OK			
1176668027-B	HNO3 to pH < 2	PA			

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.

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.

Appendix C
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).
- Review of analytical reporting limits.

1. Physical Parameter Comparisons

Precipitation

Precipitation was measured at three project locations within the Anchorage basin using tipping bucket rain gauges. Rainfall data from the PANC weather station at the AIA were used to supplement the three rain gauges. Only two tipping bucket rain gauges were available for the first storm event, as the Jewel gauge was deployed subsequent to that event.

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 and be preceded by 24 hours 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 hours. Total rainfall as measured at PANC and the three tipping bucket stations in the monitoring area during each monitored event ranged from a low of 0.11 inches at Jewel during the third event to 0.83 inches at PANC during the second event. In two cases (events one and four), sampling was completed within 24 hours from the start of a storm with the precipitation during the preceding 24 hours being less than 0.1 inches. Storm event two showed 0.12 inches of rain during the prior period at one of the four gauges and event three showed 0.1 inches of rain during the prior 24-hr period at one of the four gauges, while during each of these events the other three gauges indicated much less precipitation (≤ 0.05 inches). Based on these data, all four storms that were sampled are considered to meet storm event criteria.

Timed Bucket Measurements for Flow

Flows were monitored using the acoustic Doppler flow meter at most stations. At station SWM07, the volumetric method was utilized for three of the sampling events, 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 Quality Assurance Plan (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 1), indicating good consistency between measurements.

Table 1. Coefficients of Variation for Volume/Time Flow Measurements

Storm Event Date	Station SWM07
26-Jul-2017	2%
16-Aug-2017	10%
1-Sept-2017	5%
18-Sept-2017	Acoustic Doppler Only

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 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, 2012) were met for all parameters, including fecal coliform with its short holding time of 8 hours.

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 a relative percent difference (RPD) or the difference between measurements 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 based on the fact 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. Accuracy of field measurements was assured by calibrating field instrumentation immediately prior to the storm event on the day of sampling and by calibration checks of the instrumentation if warranted during the sampling effort.

Field analyses included dissolved oxygen, pH, temperature, turbidity, and specific conductivity. Sampling events routinely included field replicates at two stations, SWM02 and SWM08; duplicate field measurements were also taken at SWM10 during the first storm event. Table 2 provides the field variability/precision for parameters measured in the field that were conducted during the four sampling events. Replicates were taken at a rate of 22.5% for DO, pH, and temperature and at 20% for turbidity and conductivity, exceeding the 15% prescribed for all parameters in the QAP and the once/day requirement in the study plan.

Table 2. Precision and Variability of Field Parameters

Parameter	QAP Criteria	26-Jul-2017			16-Aug-2017		1-Sept-2017		18-Sept-2017	
		SWM08	SWM10	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
DO	10%	0.10	7.41	0.31	2.37	2.65	0.09	0.80	4.57	0.40
pH	+0.2 units	0.01	0.11	0.01	0.18	0.05	0.03	0.19	0.10	0.07
Turbidity	+1 NTU	1.3	*	2.0	3.0	2.0	1.7	2.9	2.6	2.0
Temperature	0.4 °C	0.04	0.02	0.00	0.01	0.02	0.00	0.01	0.05	0.01
Conductivity	+1 µS/cm	2	1	0	*	4	0	3	0	1

Values in **bold** and **red** exceeded the precision standard specified in the QAP. * denotes that a replicate sample was not taken and therefore could not be compared for precision and variability.

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 two cases (Table 3). The RPDs for field replicates of TSS for SWM08-04 and SMW12-04 were 49 and 28%, respectively, with a QAP limit of 20%. 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 fecal coliform 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.

Table 3. Field Duplicate Results for Conventional Parameters

Parameter	QAP Precision (RPD)	26-Jul-2017		16-Aug-2017		1-Sept-2017		18-Sept-2017	
		SWM08	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
TSS	25	3.6	0.0	0.5	4.5	8.1	3.6	49.3	28.9
BOD	NA	0.86	4.00	1.62	0.20	0.00	0.50	3.89	3.31
FC	60%	12	27	1	31	1	7	26	13

Values in **bold** and **red** exceeded the precision standard specified in the QAP.

Dissolved Copper and Hardness

Field replicates of dissolved copper and hardness were taken at SWM08 and SWM12; these constituents were added to the analyte list last year. 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 4 and show variability below 10% for both parameters and all events with the exception of an 80% RPD for copper at SMW12-04, reflecting a high degree of field variability at the outfall.

Table 4. Field Duplicate Results for Dissolved Copper and Hardness as CaCO₃

Parameter	QAP Precision (RPD)	26-Jul-2017		16-Aug-2017		1-Sept-2017		18-Sept-2017	
		SWM08	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
Dissolved Copper	20	0.88	5.05	7.53	8.36	1.97	2.90	0.88	80.5
Hardness	20	1.1	3.0	1.9	3.2	2.3	3.5	0.4	1.4

Values in **bold** and **red** exceeded the precision specified in the QAP.

Organic Parameters

Field replicates for the TAH (BETX) and PAH constituents were obtained at station 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 5. TAH concentrations were all below detection limits (ND) and RPDs were not calculated. Individual PAH analytes showed RPD precisions ranging from about 1–37%, with only one instance, Benzo(a)pyrene during the third storm, exceeding the QAP specified limit. All other individual PAH analytes met the precision standard. Note that where one sample of a pair showed analyte concentrations reported as ND, the reporting limit was used to calculate the RPDs.

Table 5. Field Duplicate Results for TAH and PAH

Parameter	QAP Precision (RPD)	26-Jul-2017	16-Aug-2017	1-Sept-2017	18-Sept-2017
		SWM12	SWM12	SWM12	SWM12
TAH (BETX)					
Benzene	20	---	---	---	---
Chlorobenzene	20	---	---	---	---
1,2-Dichlorobenzene	20	---	---	---	---
1,3-Dichlorobenzene	20	---	---	---	---
1,4-Dichlorobenzene	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	---	---	36.9	---
Benzo(b)fluoranthene	30	1.9	---	19.9	---
Benzo(g,h,i)perylene	30	1.2	3.3	20.6	26.0
Benzo(k)fluoranthene	30	---	---	---	---
Chrysene	30	17.1	5.6	27.8	17.9
Dibenzo(a,h)anthracene	30	---	---	---	---
Fluoranthene	30	5.0	4.7	17.8	---
Fluorene	30	---	---	---	---
Indeno(1,2,3-cd)pyrene	30	---	---	---	---
Naphthalene	30	---	---	---	---
Phenanthrene	30	---	---	---	---
Pyrene	30	1.0	2.0	6.4	---

Values in **bold** and **red** exceeded the precision specified in the QAP. "----" non-detect so no RPDs could be calculated.

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 three conventional parameters BOD, TSS, and fecal coliform. 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. The laboratory met all reporting limits for the conventional analysis.

All five laboratory duplicates for TSS for were found to have RPDs above the laboratory limit of 5%; however, all but one fell below the QAP limit of 25% and were considered acceptable with no qualification. The TSS lab batch duplicate for the fourth event of September 18th was 78.3 mg/L with the sample value of 55.2 and an RPD of 35% which is above the QAP limit of 25%; however, this laboratory sample duplication was not performed on a sample from this project, so no further qualification of project data was performed.

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 season.

Reporting limits were met for hardness, magnesium, and calcium in all events; however, the laboratory limits for copper (1.0 µg/L) are significantly higher than the limits specified in the QAP (0.1 µg/L). This did not pose a problem for most of the samples as all but three results this season were found above the elevated reporting limit, so this is unlikely to have had an effect on the data set as a whole.

Organic Parameters

Trip blanks were collected for the TAH analyses to ascertain whether the handling of the samples introduced contaminants. The trip blank samples showed no evidence of contamination. All TAH constituents were undetected.

The Laboratory and Method Blanks for organics (both TAH and PAH) were all non-detect with the exception of phenanthrene in the July 26th storm event. In that case, the blank result was found to be below the reporting limit with all sample results being non-detect, so no qualifications to the data were necessary.

Laboratory Control Samples and Sample Duplicates (LCS/LCSD) 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 relative percent difference (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 6.

Table 6. Laboratory Matrix Spike Precision and Accuracy for TAH and PAH

Parameter	QAP Standard		26-Jul-2017		16-Aug-2017		1-Sept-2017		18-Sep-2017	
	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy
	RPD	% Rec	RPD	% Rec	RPD	% Rec	RPD	% Rec	RPD	% Rec
TAH										
Benzene	20%	80-120%	2.7	105 / 108	1.6	106 / 108	0.4 3.6 0.3	109 / 108 99.6 / 96 108 / 108	0.6	100 / 99.6
Chlorobenzene	20%	80-120%	0.6	108 / 108	1.7	101 / 99.6	3.2	99 / 95.9	0.8	95.6 / 96.4
1,2-Dichlorobenzene	20%	80-120%	1.0	110 / 111	0.9	103 / 102	2.5	102 / 99.9	0.7	97.3 / 96.6
1,3-Dichlorobenzene	20%	80-120%	0.3	114 / 114	1.7	105 / 103	2.5	100 / 97.6	1.2	98 / 96.8
1,4-Dichlorobenzene	20%	80-120%	1.3	112 / 110	0.3	105 / 105	2	99.2 / 97.2	0.2	98.9 / 98.7
Ethylbenzene	20%	80-120%	0.4	117 / 117	1.9	107 / 105	2.8	103 / 100	0.5	96.3 / 96.8
Toluene	20%	77-120%	0.9	110 / 109	2.0	105 / 102	0 3.7 0.4	103 / 103 95.1 / 91.5 104 / 103	0.9 0.9	93.9 / 94.7 92.4 / 93.3
o-Xylene	20%	80-120%	1.3	112 / 114	1.9	108 / 106	0.7 3.9 0.1	112 / 112 104 / 99.5 114 / 114	0.0	98.3 / 98.3
p & m-Xylenes	20%	80-120%	0.3	126 / 126	2.7	108 / 105	1.7 3 1	113 / 111 104 / 101 114 / 113	0.9	97.6 / 96.7
PAH										
Acenaphthene	30%	53-110%	25	94.8 / 73.2	16	91.4 / 80.1	14	73 / 82.2	7.6	52.8 / 51.6
Acenaphthylene	30%	53-105%	22	82.3 / 65.6	13	79.1 / 71.3	16	60.2 / 69	7.1	60.2 / 58.5
Anthracene	30%	59-110%	27	66.3 / 50.3	16	62.3 / 54.5	12	53.6 / 59	14	45.4 / 47
Benzo(a)anthracene	30%	64-110%	61	42.9 / 22.7	32	39 / 29.1	14	29.8 / 33.6	26	17.6 / 20.7
Benzo(a)pyrene	30%	58-110%	73	32.3 / 14.8	42	28.7 / 19.4	20	17.7 / 21.5	31	10 / 12.4
Benzo(b)fluoranthene	30%	57-120%	72	35.3 / 14.9	44	33.6 / 22.1	18	18 / 22	30	12.3 / 15.1
Benzo(g,h,i,)perylene	30%	48-123%	77	23 / 8.3	43	19.7 / 11.8	18	12.6 / 15.6	31	5.9 / 8.2
Benzo(k)fluoranthene	30%	58-124%	75	34.5 / 15.5	32	26.6 / 19.7	17	20 / 23.2	36	10.1 / 13.2
Chrysene	30%	63-110%	59	55.8 / 29.9	29	37.4 / 26.9	12	35.2 / 38.9	24	16.6 / 20.4
Dibenzo(a,h)anthracene	30%	53-125%	77	22.8 / 10.1	44	21.3 / 13.9	22	14 / 17.1	37	6 / 7.9
Fluoranthene	30%	59-115%	42	62.4 / 37.8	25	54.4 / 41.3	12	43.2 / 48.6	17	34.3 / 36.9
Fluorene	30%	56-110%	22	77.5 / 61.6	16	72.5 / 63.8	13	60.3 / 67.3	10	53.8 / 54.1
Indeno(1,2,3-cd)pyrene	30%	51-125%	76	22.6 / 10.1	45	21.5 / 14	20	14.4 / 17.2	35	6.8 / 8.8
Naphthalene	30%	45-100%	21	82.7 / 66.1	14	83.5 / 74.6	21	56.6 / 68.1	6.1	57.9 / 55.7
Phenanthrene	30%	58-115%	27	76.2 / 57.3	18	71.2 / 61	11	60.5 / 66.1	12	54.7 / 55.7
Pyrene	30%	62-128%	43	65.8 / 38.4	25	54.9 / 41.5	11	53.5 / 58.7	20	37.5 / 41.6

Values in **bold** and **red** did not meet the criteria in the QAP.

All laboratory control sample and matrix spike recoveries and their RPDs were within acceptable range for the TAH compounds for all events with one exception. The matrix spike for p&m-Xylenes was recovered at 126% for both the MS and the MSD which is above the lab limit of 121% and the QAP limit of 120%. Since the corresponding sample results were non-detect and the associated LSC/LCSD showed an acceptable RPD, no further action is required.

For the PAH, the story is more complex. The analysis of the samples from all four storm events showed that most of the high weight PAH analytes were recovered in the matrix spikes with large RPDs that fell outside laboratory control limits. However, the LCS spike recoveries were in range for those parameters, indicating a potential matrix interference with these results. Data with low recoveries were evaluated by looking at those results where the recoveries were found 20 points outside the lower laboratory limit and exhibiting an RPD >30. Further, the sample results associated with those analytes were looked at 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. Initial qualification of batch sample data was not performed by the laboratory as a result of low matrix recoveries since all LCS recoveries and their duplicate RPDs were within their respective acceptance ranges.

Most PAH surrogate recoveries were reported within laboratory control limits. The exception to this was the surrogate terphenyl-d14, which was utilized only during the first storm event. During that event, six results (two field samples, two field duplicates, and two MS samples) all fell below the laboratory control limit. Samples were re-extracted (outside of holding time) and results were found to be comparable, so no qualification was applied by the laboratory. Although terphenyl-d14 is listed in the QAP as a surrogate for the PAH analysis, it is more commonly used to represent Base/Neutral compounds, but does not necessarily represent the recovery of specific PAH compounds due to the difference in chemical structures and analyte behavior. Therefore, while terphenyl-d14 was recovered poorly, this is likely not indicative of the recoveries of the PAH compounds. The recovery of PAH compounds during the extraction and analysis process are better represented by the surrogates 2-Methylnaphthalene-d10 and Fluoranthene-d10 which the laboratory utilized during the remaining three storm events. As the high molecular weight PAHs for the first event were already qualified, this excursion for the surrogate terphenyl-d14 is dismissed without any further qualifications to the data.

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, it is expected that there may be differences in the analyses that are the result of field variability and not due to any issues with the laboratory analysis.

Reporting limits were met for most organic parameters during all events. Slightly higher limits were reported for phenanthrene and pyrene at on one sample (SWM09-04) due to a low sample volume; this excursion was not judged to have an effect on the data. Most PAH analytes at SWM07-02 also exhibited higher reporting limits that was due to dilution of the sample as called for by the analyst due to potential contamination as indicated by visual examination of the sample extract. Most of the higher reporting limits for this sample were within 0.02 µg/L of the target limit, so this was not likely to have an effect on the data. Three analytes reported as non-

detects (naphthalene, phenanthrene, and pyrene) were potentially biased low as they had significantly higher limits (0.13-0.26 µg/L) than the target limits. Although this is noted, no additional qualifiers were applied to the analytical data. These minor excursions are unlikely to have had an effect on the data set as a whole as concentrations and detection limits are very low when compared to AWQS criteria.

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 (temperature, DO, pH, turbidity, and conductivity) were recorded 99% of the time; one turbidity duplicate sample result was missed during the first storm event at SWM10, and one conductivity result recorded on the field logs during the second storm event was dismissed as it had been noted as suspect during sampling. 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, holding time, and completeness criteria were all met. 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 the PAH analytes in both the MS and MSDs during all four storm events, resulting in these analytes being re-qualified as potentially biased low due to potential matrix interference inherent in the stormwater samples. In addition, poor recoveries seen for one PAH surrogate during the first storm event were judged to have little overall effect on the data; use of this surrogate was discontinued after the first event. 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.