



Dave Bronson, Mayor

2021 Stormwater Outfall Monitoring Report

APDES Permit No. AKS052558

FINAL REPORT

DECEMBER 2021

MUNICIPALITY OF ANCHORAGE

WATERSHED MANAGEMENT SERVICES

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

Prepared by: HDR Inc.
2525 C Street, Suite 500
Anchorage, AK 99503



This page intentionally left blank.



Table of Contents

1.0	Introduction	1
1.1	Background.....	1
1.2	Stormwater Definition.....	1
1.3	Monitoring Program Objectives	2
1.4	Report Organization.....	2
2.0	Program Description and Methodology.....	3
2.1	Monitoring Sites	3
2.2	Measured Parameters	7
2.3	Precipitation	8
2.4	Sampling Events.....	13
2.5	Field Sampling Procedures	15
2.6	Sampling Handling and Chain of Custody Procedures.....	16
2.7	Laboratory Analyses	17
2.8	Deviation from the QAP	17
2.9	QA/QC and Data Validation	17
3.0	Results and Discussion	18
3.1	Field Measurements	18
3.2	Conventional Parameters (BOD5 and TSS).....	28
3.3	Fecal Coliform.....	29
3.4	Metals and Hardness	31
3.5	Hydrocarbons	34
3.6	Multi-Year Site Trends	40
3.7	Seasonal and Yearly Trends.....	49
3.8	Annual Loading.....	51
4.0	Summary and Conclusions.....	54
5.0	References.....	55



Figures

Figure 1. Overview Map of Outfall Monitoring Sites and Subbasins.....	6
Figure 2. 2021 Monitoring Period and Cumulative Precipitation (in. of water) at the PANC Weather Station	9
Figure 3. 2021 Monthly Precipitation Measured at the PANC Weather Station Compared to Normal.....	10
Figure 4. Rainfall Measured at the Ben Boeke and Thomas Rain Gauges, by Calendar Day.....	11
Figure 5. Rainfall Measured at the Lynwood and Eloise Spencer Rain Gauges, by Calendar Day.....	12
Figure 6. Flow Rates Measured at Monitoring Sites during All Four Events	20
Figure 7. Turbidity Measured in Stormwater Sampled at Monitoring Sites during All Four Events.....	20
Figure 8. Dissolved Oxygen Measured in Stormwater Sampled at Monitoring Sites during All Four Events	21
Figure 9. Total Dissolved Solids Measured in Stormwater Sampled at Monitoring Sites during All Four Events	21
Figure 10. pH (units) Measured in Stormwater Sampled at Monitoring Sites during All Four Events.....	22
Figure 11. Temperature (°C) Measured in Stormwater Sampled at Monitoring Sites during All Four Events	22
Figure 12. BOD ₅ (mg/L) Measured in Stormwater Sampled at Monitoring Sites during All Four Events ...	30
Figure 13. Total Suspended Solids Measured in Stormwater Sampled at Monitoring Sites during All Four Events	30
Figure 14. Fecal Coliform (FC/100 mL) Measured in Stormwater Sampled at Monitoring Sites during All Four Events.....	31
Figure 15. Water Hardness (mg/L) Measured in Stormwater Samples.....	33
Figure 16. Dissolved Copper (µg/L) Measured in Stormwater Samples	33
Figure 17. Total Aqueous Hydrocarbons (TAqH = TAH + TPAH) Measured in Stormwater Sampled at Monitoring Sites during All Four Events.....	35
Figure 18. Station Box Plot of Temperature by Outfall, All Data 2011 through 2021	40
Figure 19. Station Box Plot of Dissolved Oxygen by Outfall, All Data 2011 through 2021.....	41
Figure 20. Station Box Plot of pH by Outfall, All Data 2011 through 2021	42
Figure 21. Station Box Plot of Total Dissolved Solids by Outfall, All Data 2011 through 2021	43
Figure 22. Station Box Plot of Total Suspended Solids by Outfall, All Data 2011 through 2021.....	44
Figure 23. Station Box Plot of Turbidity by Outfall, All Data 2011 through 2021	44



Figure 24. Station Box Plot of BOD₅ by Outfall, All Data 2011 through 2021..... 45

Figure 25. Station Box Plot of Fecal Coliform Bacteria by Outfall, All Data 2011 through 2021 46

Figure 26. Station Box Plot of Flow Rate by Outfall, All Data 2011 through 2021..... 47

Figure 27. Station Box Plot of Hardness by Outfall, All Data 2016 through 2021 48

Figure 28. Station Box Plot of Dissolved Copper by Outfall, All Data 2016 through 2021 48

Figure 29. Seasonal Patterns for Temperature, DO, and Fecal Coliform, All Sites and All Years 50

Figure 30. Fecal Coliform Annual Loading by Monitoring Site..... 52

Figure 31. Hydrocarbon Annual Loading by Monitoring Site 52

Tables

Table 1. Outfalls Sampled under the Stormwater Outfall Monitoring Program, 2011 - 2021 5

Table 2. Sample Type, Measurement Type, and Method of Analysis for Measured Parameters 7

Table 3. Parameters Measured at each Selected Outfall 8

Table 4. Precipitation Recorded During and Prior to Sampling Events (measured per Calendar Day) 14

Table 5. Precipitation Data for Each Sampling Event Presented on a 24-Hour Basis 15

Table 6. *In situ* Parameters Measured at Monitoring Sites during All Four Sampling Events 23

Table 7. Concentrations of Microbiological and Conventional Parameters 26

Table 8. Concentrations of Hardness and Dissolved Copper..... 32

Table 9. Hydrocarbon Concentrations Measured in Stormwater at Four Sites during All Four Storm Events. 36

Table 10. Pertinent Numeric Alaska Water Quality Standard (AWQS) Criteria..... 37

Appendices

Appendix A Outfall Site Maps

Appendix B Photographs

Appendix C Laboratory Data Packages and Chain of Custodies

Appendix D Field and Laboratory Data Validation

Appendix E Field Logs

List of Acronyms

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

NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Units
OGS	Oil/Grit Separator
PAHs	Polycyclic Aromatic Hydrocarbons
PANC	NOAA National Weather Service Station at TSAIA
QA/QC	Quality Assurance/Quality Control
QAP	Monitoring, Evaluation, and Quality Assurance Plan
QC	Quality Control
SMRC	Stormwater Managers Resource Center.
Eloise Spencer	Rain Gauge at Elmore and Huffman Roads
SRMs	Standard Reference Material
SWM	Stormwater Outfall Monitoring
TAqH	Total Aqueous Hydrocarbons
TAH	Total Aromatic Hydrocarbons
TDS	Total Dissolved Solids
Thomas	Rain Gauge at Lake Otis Parkway and Tudor Road
TMDL	Total Maximum Daily Load
TNTC	Too Numerous to Count
TPAH	Total Polycyclic Aromatic Hydrocarbons
TSAIA	Ted Stevens Anchorage International Airport
TSS	Total Suspended Solids
USGS	United States Geological Survey

1.0 Introduction

This report details the findings of the 2021 Municipality of Anchorage (MOA) stormwater monitoring program. This program satisfies the stormwater outfall monitoring requirements of the current Municipal Separate Storm Sewer System (MS4) permit (Permit No. AKS052558) in compliance with the National Pollutant Discharge Elimination System (NPDES) established under the Clean Water Act (CWA).

1.1 Background

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

The Anchorage MS4 permit establishes control measures requiring the co-permittees to develop programs designed to prevent contaminants from entering the storm sewer system. The permit also identifies monitoring objectives, including stormwater outfall monitoring (Section 4.1.7 of the MS4 permit). The MOA has taken the lead role in administering the stormwater outfall monitoring (SWM) program. The MS4 permit requires the selection of 10 priority outfall locations for stormwater monitoring that represent a variety of major land use areas within the Anchorage Bowl. It also requires selected outfall locations to be sampled four times each year during storm events that meet specific criteria for a designated set of physical and chemical parameters. Stormwater sampling conducted during 2021 represents the first year of monitoring under the 2020 MS4 permit and the eleventh year of monitoring selected outfalls during storm events.

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

1.2 Stormwater Definition

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

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

those waters. The current MS4 permit cites the Final DEC 2014/2016 Integrated Report that identifies 11 Anchorage-area waterbodies as impaired for fecal coliform (ADEC 2018). These waterbodies include Campbell Creek, Campbell Lake, Chester Creek, Fish Creek, Furrow Creek, Little Campbell Creek, Little Rabbit Creek, Little Survival Creek, Ship Creek, University Lake, and Westchester Lagoon. ADEC has developed, and EPA has approved, TMDLs for fecal coliform for all 11 listed waterbodies. The TMDL implementation plans identify urban runoff as the major contributor of fecal coliform pollution and establish specific reduction goals to improve stormwater quality and reduce the resulting impact on receiving waters.

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

1.3 Monitoring Program Objectives

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

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

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

1.4 Report Organization

Section 2.0 of this report includes an overview of the SWM Program and provides background information regarding the outfall site selection process, the water quality parameters tested, and procedures followed as required by the MS4 permit. This section also details 2021 fieldwork conducted under the Program, including a discussion of the sampling events and the associated

weather and precipitation data. Discussion of field-sampling procedures, sample handling and chain of custody, laboratory analyses, quality control, and data validation procedures is included.

Section 3.0 presents the results of the 2021 SWM Program, including tabular and graphical summaries of field measurements and lab data, as well as a discussion of results, site trends, yearly and seasonal trends, and annual loading from MS4 discharge.

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

2.0 Program Description and Methodology

The SWM Program was developed to meet the MS4 permit requirements and is defined in the updated *Monitoring, Evaluation, and Quality Assurance Plan (QAP)* for the MS4 permit (MOA 2020). Appendix B of the QAP, *Stormwater Outfall Monitoring Plan* specifically details the SWM Program, including the program design rationale, sampling methodology and protocols, field team training requirements, and results to be presented in the annual report.

2.1 Monitoring Sites

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

The methodology used to define the monitoring corridor and identify and prioritize the outfalls is described in the QAP (MOA 2020). Under the 2009 MS4 permit, the MOA selected and ranked 30 subbasins within a targeted area of the Anchorage Bowl for inclusion in the SWM Program (MOA 2011). Selected subbasins include those zoned for a single predominant land use, subbasins zoned for mixed land uses, and subbasins with and without oil and grit separator (OGS) devices. These subbasins were then ranked based on the area of impervious surface directly connected to the storm drain system leading to the outfall, access to the outfall, and accessibility of the outfall from legal parking.

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

Two outfalls, SWM01 and SWM02, were sampled from 2011 through 2016. However, these outfalls were replaced in 2017. SWM01 was discontinued due to inconsistent flow and the small size of the drainage area. The replacement outfall, SWM11, also drains a residential land use subbasin and has a larger drainage area than SWM01. SWM02 was discontinued when it was determined that the outfall is not truly representative of the contributing land use area as a result of influence of streamflow from Little Campbell Creek. SWM02 was replaced with SWM12, which also drains a commercial and industrial land use subbasin. SWM11 and SWM12 were not included on the original list of 30 prioritized subbasins but were selected because their location in

the monitoring corridor and the characteristics of their subbasins are similar to those of SWM01 and SWM02.

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

Table 1 presents the characteristics of the outfalls sampled under the SWM Program, including physical location, geographic location, outfall dimensions, acreage of subbasin, and percent impervious surface of the subbasin. Figure 1 shows the locations of the 10 currently monitored outfalls and subbasins within the monitoring corridor. Figure 1 also shows the locations of four tipping bucket rain gauges installed along the monitoring corridor in 2021. Detailed site maps showing the outfalls and the land use types of the contributing subbasins are included as Appendix A.



Table 1. Outfalls Sampled under the Stormwater Outfall Monitoring Program, 2011 - 2021

Station ID	Subbasin ID	Outfall Node ID	Watershed	Contributing Land Use	OGS Present	Priority Rank ^a	Latitude	Longitude	Outfall Diameter (inches)	Subbasin Area (acres)	Subbasin Percent Impervious
SWM01	1040b	1040-3	Little Campbell	Residential	No	10	61° 07.526'	-149° 50.196'	18	91.38	36
SWM02	1210	847-1	Little Campbell	Commercial and Industrial	No	17	61° 08.665'	-149° 50.797'	18	37.17	82
SWM03	1224a	1224-1	Campbell	Residential	Yes	3	61° 09.548'	-149° 52.443'	36	92.78	70
SWM04	1224b	1224-2	Campbell	Residential	Yes	6	61° 09.545'	-149° 52.451'	20	20.10	32
SWM05	805	207-1	Campbell	Commercial and Industrial	Yes	1	61° 10.202'	-149° 52.326'	32	58.34	75
SWM06	219	314-22	Chester	Residential	Yes	2	61° 11.996'	-149° 50.750'	24	33.81	37
SWM07	507	484-1	Chester	Commercial and Industrial	No	8	61° 12.100'	-149° 52.114'	24	50.17	83
SWM08	549	86-1	Chester	Mixed	No	6	61° 12.095'	-149° 52.114'	42	354.62	69
SWM09	132	499-1	Chester	Commercial and Industrial	Yes	4	61° 12.176'	-149° 52.554'	24	40.04	54
SWM10	554	525-2	Chester	Mixed	No	5	61° 12.161'	-149° 52.486'	24	47.51	75
SWM11	1103	348-3	Furrow	Residential	No	-	61° 06.448'	-149° 52.734'	36	86.32	39
SWM12	1449	1454-1	Campbell	Commercial and Industrial	No	-	61° 09.758'	-149° 52.525'	24	111.68	60

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

^aMOA 2011

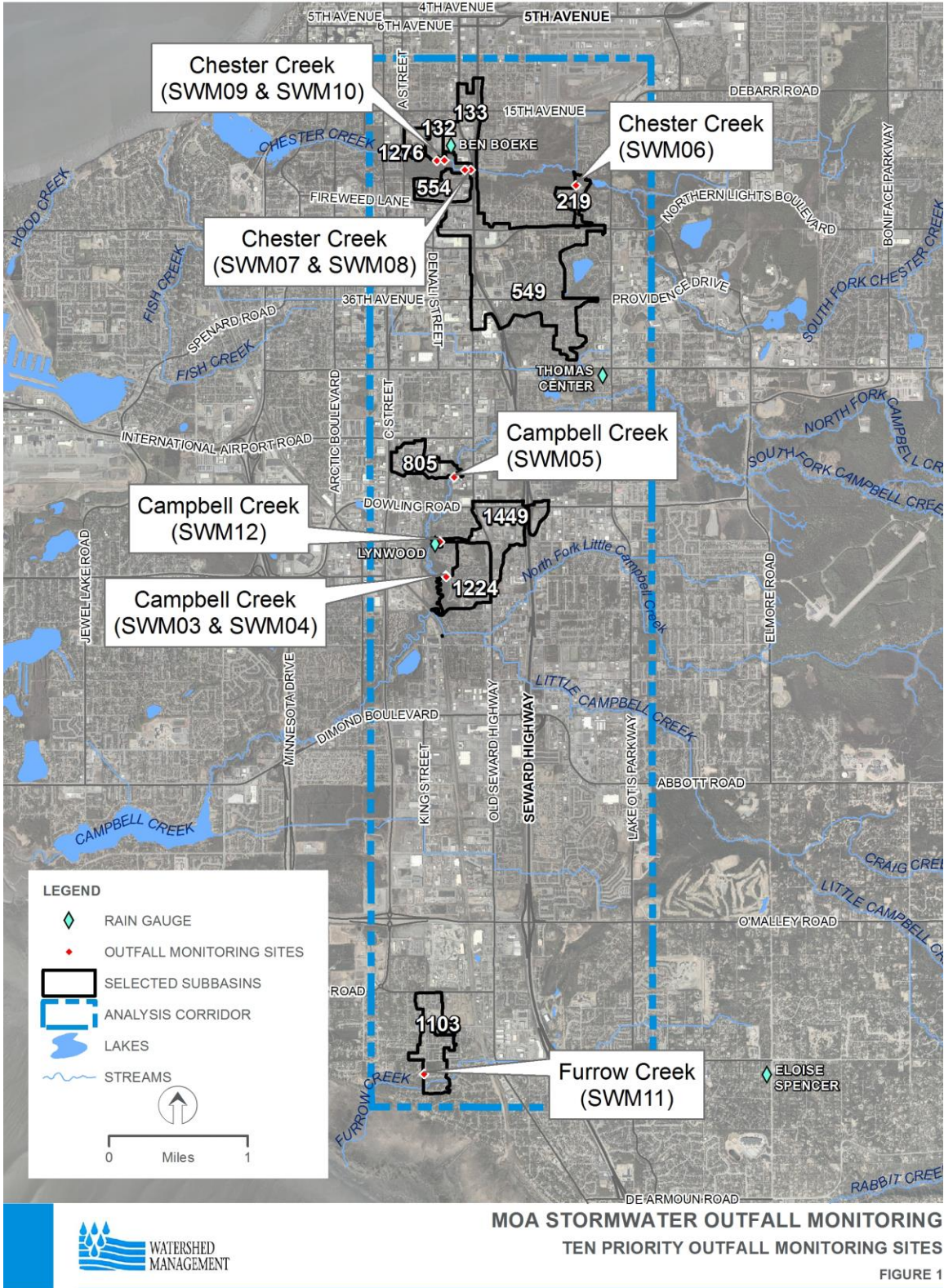


Figure 1. Overview Map of Outfall Monitoring Sites and Subbasins.

Detailed maps of each subbasin are provided in Appendix A.



2.2 Measured Parameters

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

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

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

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

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

Pro = Professional

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



petroleum hydrocarbon concentrations, the SWM Program samples two outfalls within commercial and industrial subbasins that contain OGS systems, and two that do not have OGS systems.

Table 3. Parameters Measured at each Selected Outfall

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

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

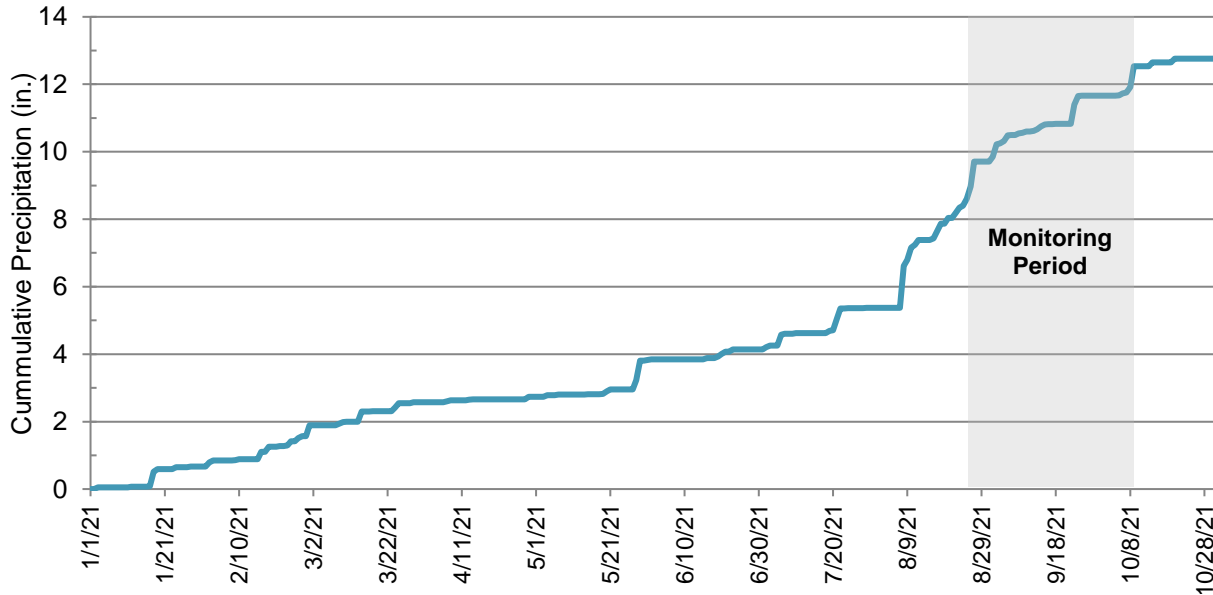
2.3 Precipitation

The SWM Program measures pollutants and pollutant indicators in stormwater at the 10 selected outfalls four times each summer. Sampling events are triggered by storms that generate 0.1 inches of precipitation or greater in 24 hours and are preceded by a period of 24 hours with less than 0.1 inches of precipitation. Rainfall at the National Weather Service (NWS 2021a) mesonet KTUU-midtown weather station was monitored to determine whether a rainfall event provided sufficient precipitation to trigger a sampling event. This weather station is centrally located in the monitoring corridor and provides a good representation of active precipitation that would produce runoff at the sites. The weather station website updates every five minutes with the latest precipitation amount and displays 72-hours' worth of data with a 24-hour running precipitation total.

Four stormwater outfall monitoring events were conducted in 2021 as required by the MS4 permit. The 2021 monitoring period began on August 27 and concluded on October 8. Sampling events took place on August 27, September 2, September 24, and October 8. Approximately 8.8 inches of precipitation (including snow, reported as water equivalent) had been measured in 2021 at the TSAIA PANC weather station before the first event was sampled. The PANC weather station has

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

Figure 2. 2021 Monitoring Period and Cumulative Precipitation (in. of water) at the PANC Weather Station

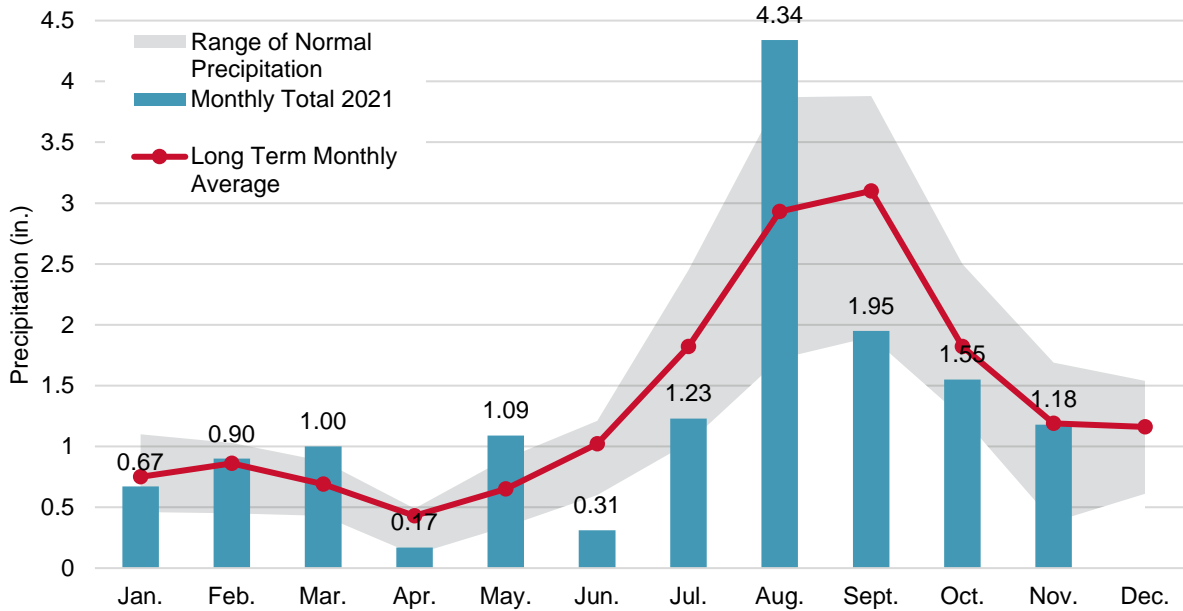


Source: NOAA 2021

Precipitation amounts for 2021 had an irregular trend when compared to the long-term averages. March had more precipitation followed by a drier than average April, similarly for May (wetter) and June (drier). However, July had less precipitation than average followed by a wetter August. When compared to the long-term accumulation average of 15.26 inches (analyzed through November), it shows the 2021 precipitation in Anchorage (0.87 inches) is below average.

During the sampling period, Anchorage received average rainfall that was distributed dissimilar to historic trends. For August, the recorded rainfall of 4.34 inches was above the long-term average of 2.93 inches. For September, the recorded rainfall of 1.95 inches was below the long-term average of 3.10 inches. For October, the recorded rainfall of 1.55 inches was below the long-term average of 1.82 inches. The highest monthly precipitation for the year occurred in August, unlike the historical average for September. The rainfall recorded in 2020 at the PANC weather station compared to historical precipitation data is shown in Figure 3.

Figure 3. 2021 Monthly Precipitation Measured at the PANC Weather Station Compared to Normal



Note: Normal range of precipitation shown is the range between the 25th and 75th percentiles of monthly precipitation averages recorded at the PANC weather station for the 30-year period from 1991 to 2020. Source: NOAA 2020 and NWS 2021b.

Four tipping bucket rain gauges installed within the monitoring area recorded precipitation throughout the monitoring period. The rain gauges were located along the monitoring corridor to provide a representation of the actual rainfall within the sampled subbasins. During precipitation events, the collection bucket in the gauge collects precipitation until it reaches the equivalent of 0.01 inch of precipitation whereupon the bucket tips, triggering a reed switch and recording an event with a time stamp. These events are stored in a data logger and downloaded into a computer program where they are summarized over different time intervals or graphed as a time series. The gauges were located at the Ben Boeke Indoor Ice Arena (“Ben Boeke”), near Lake Otis Parkway and Tudor Road (“Thomas”), at the Lynwood Retention Basin at SWM12 (“Lynwood”), and in South Anchorage near Elmore and Huffman Roads (“Eloise Spencer”) and represent the northern, middle, and southern portions of the study area respectively. In previous years, a rain gauge in Nunaka Valley (“Nunaka”) has been used. This year, it was relocated and replaced with the Ben Boeke rain gauge to better represent precipitation events in the northern portion of the monitoring corridor. It should also be noted that after September 24, 2021 air temperatures began to dip below freezing affecting when the project rain gauges recorded liquid precipitation. During this time, the corresponding date of the precipitation may be slightly off but the overall accumulation should still be accurate. The locations of the rain gauges installed in 2021 are shown on Figure 1. Daily rainfall records for the rain gauges are shown in Figure 4 and Figure 5.

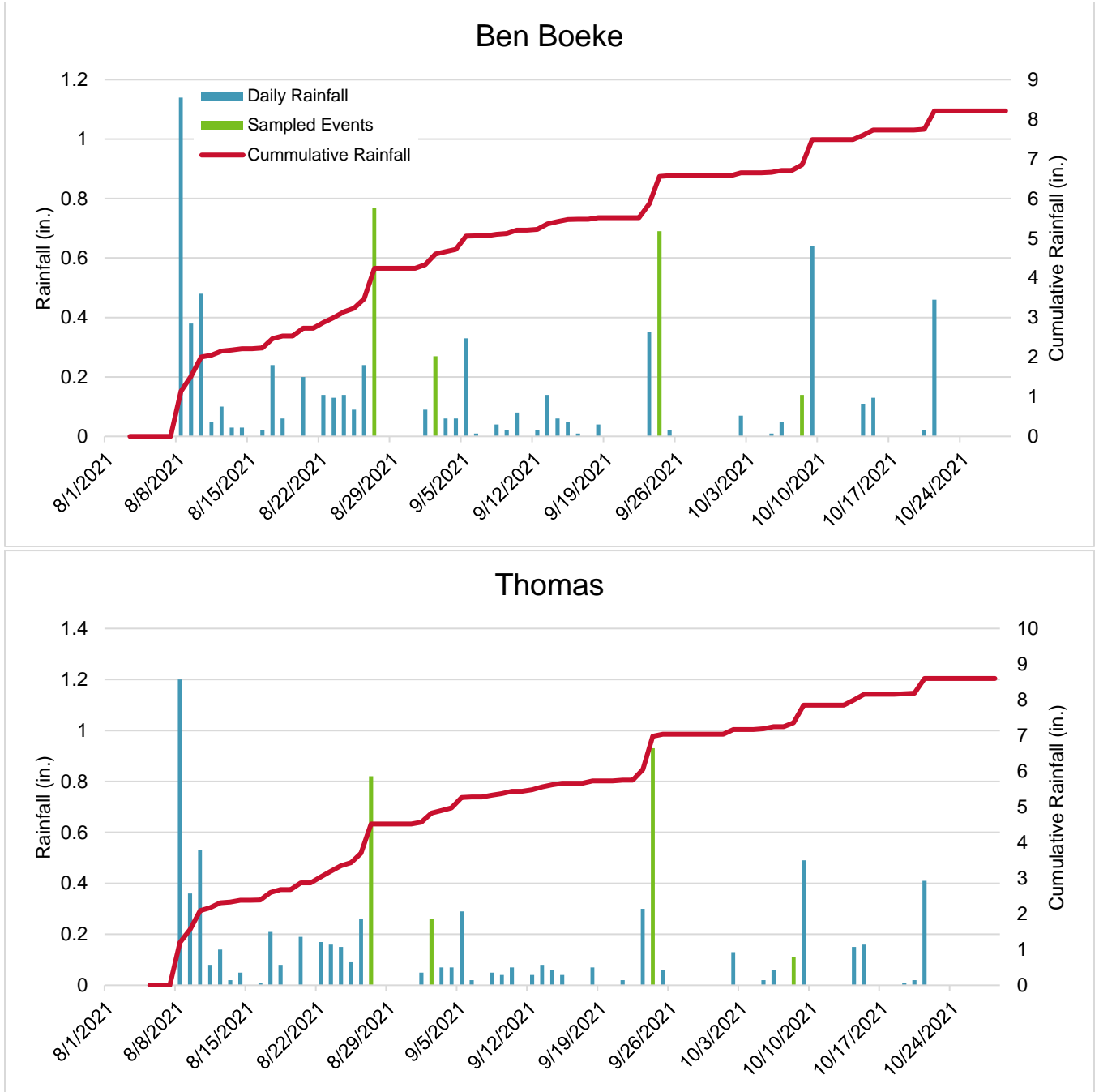


Figure 4. Rainfall Measured at the Ben Boeke and Thomas Rain Gauges, by Calendar Day

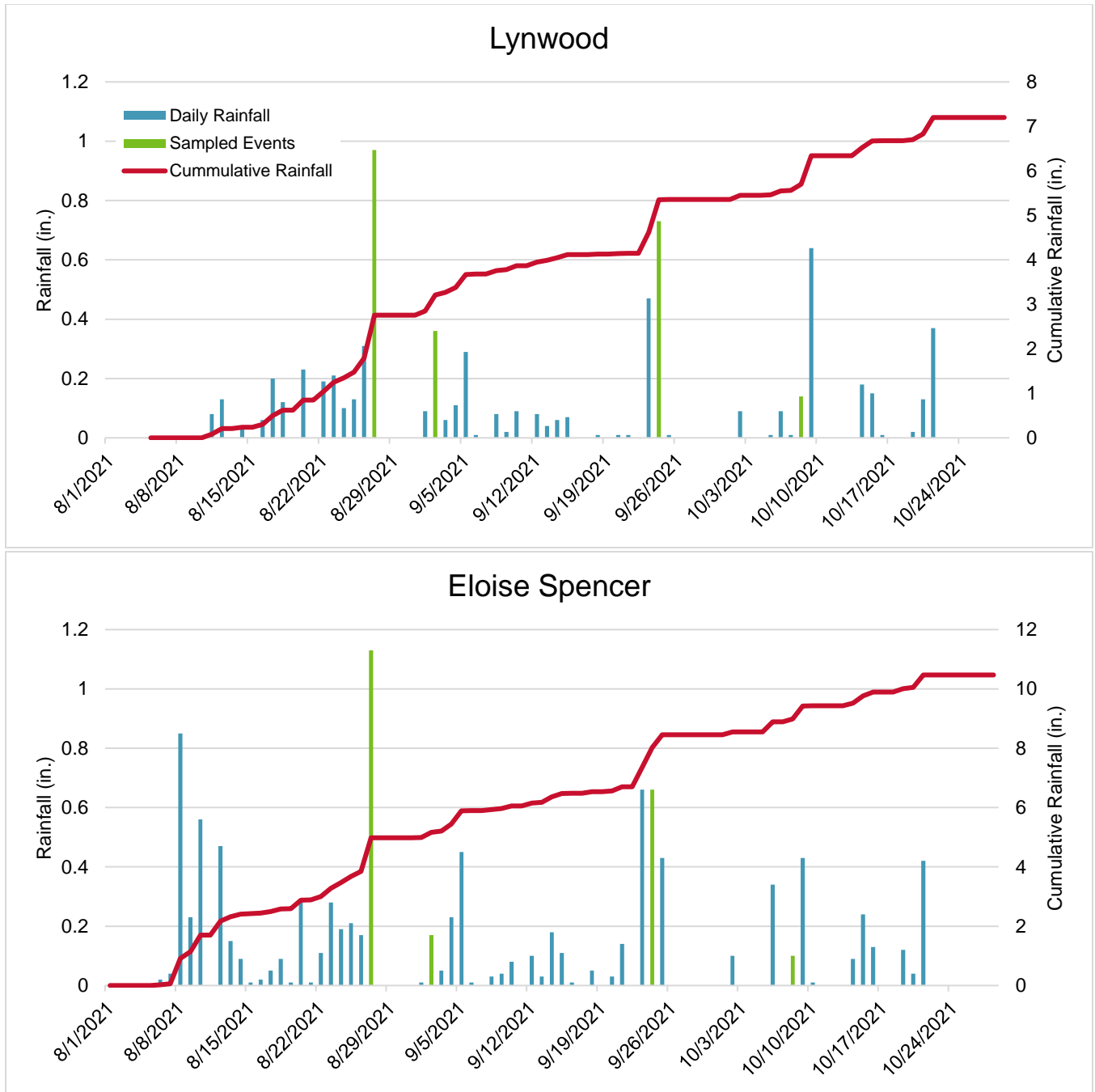


Figure 5. Rainfall Measured at the Lynwood and Eloise Spencer Rain Gauges, by Calendar Day

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

day basis in Table 4 and demonstrates considerable variability in the geospatial distribution of precipitation throughout the monitoring corridor.

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

2.4 Sampling Events

The first storm event sampled as part of the 2021 SWM Program occurred on August 27 (Storm 1). Sampling was initiated at 07:30, approximately nine hours after the beginning of the storm and was completed by 11:45. The rain gauges measured between 0.95 and 1.23 inches of rain fell across the monitoring corridor from the beginning of the storm to the conclusion of sampling. This storm produced a total of 1.01 to 1.29 inches of precipitation over 25 hours.

The second sampled storm event occurred on September 2 (Storm 2). Sampling was initiated at 08:45, approximately 12 hours after the beginning of the storm and was completed by 13:00. The rain gauges measured between 0.17 and 0.38 inches of rain fell across the monitoring corridor from the beginning of the storm to the conclusion of sampling. This storm produced a total of 0.17 to 0.38 inches of precipitation over 14 hours.

The third sampled storm event occurred on September 24 (Storm 3). Sampling was initiated at 07:00, approximately 14 hours after the beginning of the storm and was completed by 10:30. The rain gauges measured between 0.50 and 0.88 inches of rain fell across the monitoring corridor from the beginning of the storm to the conclusion of sampling. This storm produced a total of 1.05 to 1.32 inches of precipitation over 32 hours.

The fourth sampled storm event occurred on October 8 (Storm 4). Sampling was initiated at 08:45, approximately 4 hours after the beginning of the storm and was completed by 12:15. The KTUU-midtown weather station recorded 0.10 inches before sampling was initiated; however, the project rain gauges only recorded between 0.04 to 0.08 inches of rainfall across the monitoring corridor, from the beginning of the storm to the conclusion of sampling. The variance in rainfall recorded by the KTUU-midtown weather station and project rain gauges demonstrates how diverse precipitation events over the Anchorage Bowl can be. This storm produced a total of 0.10 to 0.16 inches of precipitation over 21 hours, making it the smallest storm sampled during this year's program.

This year's storms generally had low precipitation intensity spread over a long duration. Outfalls with small drainage basins commonly rely on higher precipitation intensity to produce enough flow for sampling. When comparing this year's storms, Storm 1 was the most intense storm, raining



the most of all the storms during sampling. In contrast, Storm 4 was the least intense storm, raining the least of all the storms during sampling.

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

	Date	PANC Airport	Ben Boeke	Thomas	Lynwood	Eloise Spencer
		(in.)	(in.)	(in.)	(in.)	(in.)
	8/20/2021	0.17	0.2	0.19	0.23	0.29
	8/21/2021	0	0	0	0	0.01
	8/22/2021	0.14	0.14	0.17	0.19	0.11
	8/23/2021	0.16	0.13	0.16	0.21	0.28
	8/24/2021	0.06	0.14	0.15	0.1	0.19
	8/25/2021	0.21	0.09	0.09	0.13	0.21
	8/26/2021	0.36	0.24	0.26	0.31	0.17
Event 1	8/27/2021	0.74	0.77	0.82	0.97	1.13
	8/28/2021	0	0	0	0	0
	8/29/2021	0	0	0	0	0
	8/30/2021	0	0	0	0	0
	8/31/2021	0	0	0	0	0
	9/1/2021	0.14	0.09	0.05	0.09	0.01
Event 2	9/2/2021	0.37	0.27	0.26	0.36	0.17
	≠					
	9/17/2021	0	0	0	0	0
	9/18/2021	0.01	0.04	0.07	0.01	0.05
	9/19/2021	0	0	0	0	0
	9/20/2021	0	0	0	0.01	0.03
	9/21/2021	0	0	0.02	0.01	0.14
	9/22/2021	0	0	0	0	0
	9/23/2021	0.57	0.35	0.3	0.47	0.66
Event 3	9/24/2021	0.25	0.69	0.93	0.73	0.66
	≠					
	10/1/2021	0	0	0	0	0
	10/2/2021	0	0.07	0.13	0.09	0.1
	10/3/2021	0	0	0	0	0
	10/4/2021	0	0	0	0	0
	10/5/2021	0.01	0.01	0.02	0.01	0
	10/6/2021	0.06	0.05	0.06	0.09	0.34
	10/7/2021	0.03	0	0	0.01	0
Event 4	10/8/2021	0.16	0.14	0.11	0.14	0.10



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

	<u>Conclusion of Sampling</u>	<u>Time Period</u>	<u>Time Period Range</u>	<u>Rainfall Measured (Inches)</u>			
				<u>Ben Boeke</u>	<u>Thomas</u>	<u>Lynwood</u>	<u>Elosie Spencer</u>
		Preceding 24 hours	11:45 8/25 to 11:45 8/26	0.09	0.09	0.13	0.22
Event 1	08/27/2021 at 11:45	24 Hour Storm Period	11:45 8/26 to 11:45 8/27	0.95	0.98	1.23	1.14
		Preceding 24 hours	13:00 8/31 to 13:00 9/1	0.02	0.01	0.01	0.00
Event 2	09/02/2021 at 13:00	24 Hour Storm Period	13:00 9/1 to 13:00 9/2	0.31	0.24	0.38	0.17
		Preceding 24 hours	11:00 9/22 to 11:00 9/23	0.00	0.00	0.00	0.00
Event 3	09/24/2021 at 10:30	24 Hour Storm Period	11:00 9/23 to 11:00 9/24	0.72	0.50	0.79	0.88
		Preceding 24 hours	00:00 10/7 to 23:59 10/8	0.00	0.00	0.01	0.00
Event 4	10/08/21 at 12:15	24 Hour Storm Period	00:00 10/7 to 23:59 10/8	0.14	0.11	0.14	0.10

2.5 Field Sampling Procedures

Sampling procedures were carried out in accordance with the methodology outlined in the QAP. No changes from previous years' sampling procedures were required in 2021.

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

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

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

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

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

The field team conducted replicate field measurements and laboratory analyses at a rate of 15 percent (%) per sampling event. This resulted in replicate field measurements being taken at two monitoring sites per sampling event for all parameters except TAH and PAH. TAH and PAH required one replicate field measurement since they are collected at fewer outfalls. TAH analyses also included a trip blank sample, provided by the laboratory that accompanied the sample bottles in the field. Additional water for BOD₅, TSS, dissolved copper, TAH, and PAH was collected at one station to allow the laboratory to perform matrix spike/matrix spike duplicate (MS/MSD) analyses.

2.6 Sampling Handling and Chain of Custody Procedures

BOD₅, TSS, fecal coliform, dissolved Cu, hardness, TAH, and PAH samples were collected, preserved, and cooled for delivery to the laboratory as described in the QAP. Alaska Water Laboratories (AWL) is located in Wasilla, so no special sample shipping or packaging was required. Upon sample collection, all samples were kept chilled to 4°C ± 2°C with gel ice and delivered to the AWL laboratory by the field team following the sample collection effort. AWL was then in custody of the samples as they processed them and moved some of them to subsidiary laboratories. All samples were transferred to the laboratories under chain of custody (COC) procedures as outlined in the QAP. Copies of completed COCs are included with the laboratory data reports in Appendix C.

2.7 Laboratory Analyses

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

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

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

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

2.8 Deviation from the QAP

There were no deviations from the QAP during the 2021 monitoring year with respect to field sampling procedures, sample handling, sample chain of custody, laboratory analysis, QA/QC, and data validation.

The YSI 556 multi-probe has been discontinued and is being phased out. The YSI Pro Plus is the replacement probe that meets the sampling requirements outlined by the QAP. The YSI Pro Plus multi-probe was used during the 2021 sampling efforts.

2.9 QA/QC and Data Validation

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

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

- Sample handling (chain of custody)
- Temperature blank
- Holding time compliance

- MS/MSD and LCS/LCSD results
- Field replicate comparison
- Data validation

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

Sample custody was maintained for the samples. The coolers transporting the samples remained at ambient temperatures or were cooled to 4°C ± 2°C before being delivered to the laboratory within a few hours of each sampling event.

The QA/QC officer validated data reported by the laboratory. Data that was determined to be either biased low or high was flagged based on low or high recovery rates from laboratory control samples. Data that was considered suspicious was also rejected and flagged as such. For a more detailed summary of field and laboratory data validation results, refer to Appendix D. Other QA/QC procedures in 2021 included the requirement that all field team members read the QAP. Each team consisted of one ADEC-qualified sampler and one sampler in training. The field team was also required to QC data at the end of each event to determine all data were collected and sampling information was complete.

3.0 Results and Discussion

3.1 Field Measurements

In situ field measurements taken as part of the 2021 SWM Program are presented in Figures 6 through 11 and in Table 6. Reported measurements include flow, turbidity, DO, conductivity, pH, and temperature. Where relevant, *insitu* measurements are compared against Alaska Water Quality Standard (AWQS) benchmarks (refer to Table 9 for AWQS benchmarks used for comparisons). It should be noted that these AWQS benchmarks apply to the receiving waters and should be considered for comparison purposes only when reviewing stormwater.

Outfall flow rates are reported in Figure 6 and in Table 6. The flow rates were variable between sites and storm events, reflecting both the range in subbasin characteristics as well as the spatial and temporal variability of precipitation throughout the monitoring corridor. Outfall SWM08 had the highest mean flow rate (7.07 cubic feet per second (CFS)), as well as the maximum measured flow rate (21.8 CFS during Storm 1) of the 10 outfalls observed during this year's program. Outfall SWM09 had the lowest mean flow rate (0.030 CFS) of the outfalls sampled as well as the minimum measured flow rate (0.001 CFS during Storm 4) of the 10 outfalls observed. A correlation between storm precipitation intensity and flow rates can be seen. Storm 1 had the highest

precipitation intensity and generally highest flow rates. In contrast, Storm 4 had the lowest precipitation intensity and generally lowest flow rates.

Measured turbidity levels are reported in Figure 7 and Table 6. Like flow rates, turbidity levels were variable between storms and across the monitoring corridor, with some outfalls demonstrating consistently low turbidity readings while others exhibited spikes in turbidity during one or more of the sampling events. Mean turbidity levels recorded during this year's program at all outfalls except SWM07, SWM08, and SWM12 were below 50 Nephelometric Turbidity Units (NTU), measuring as low as 4.8 NTU. In contrast, outfalls SWM07 and SWM12 had mean turbidity levels above 100 NTU. These outfalls had measurements above 100 NTU for three of the four sampled storms (all but Storm 2) indicating a pattern of elevated turbidity at these locations. The observed variability in turbidity measurements across outfalls and sampling events was expected as turbidity is highly dependent on specific drainage basin characteristics such as land use, land permeability, drainage slope, precipitation intensity, precipitation history, and other factors, all of which vary considerably site-to-site. Turbidity qualitatively appears to correlate to measured TSS, reported in Table 7.

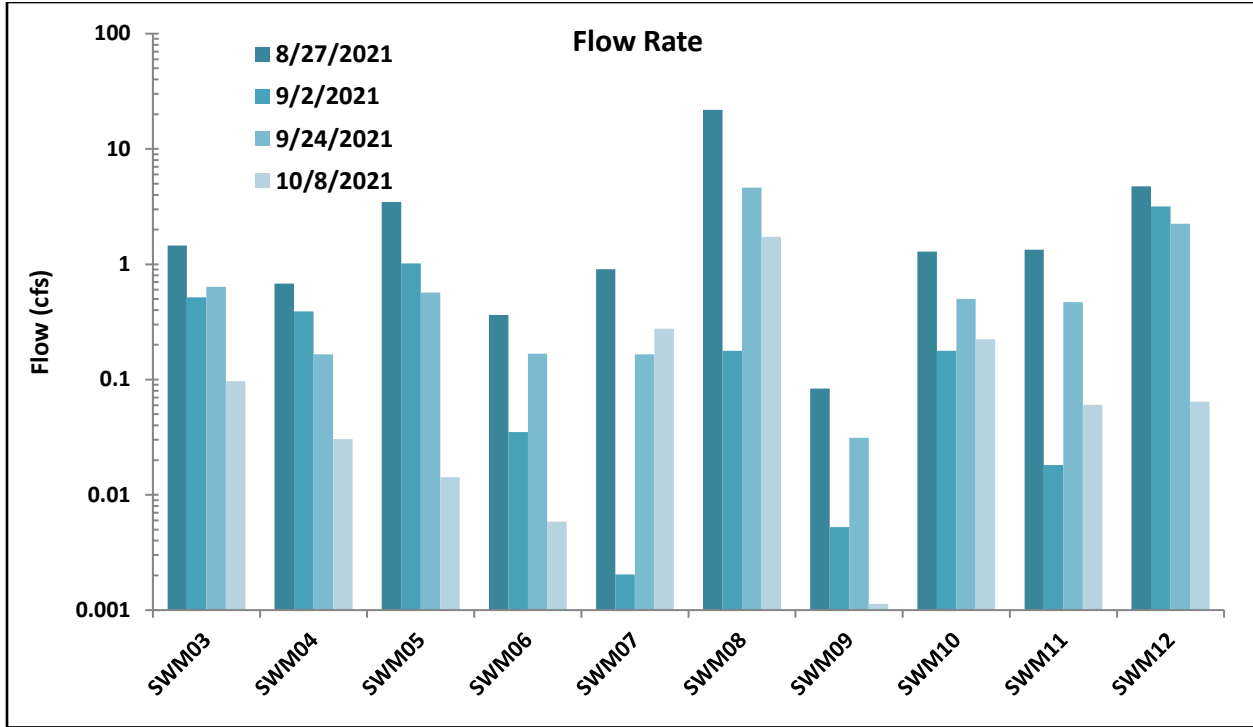


Figure 6. Flow Rates Measured at Monitoring Sites during All Four Events

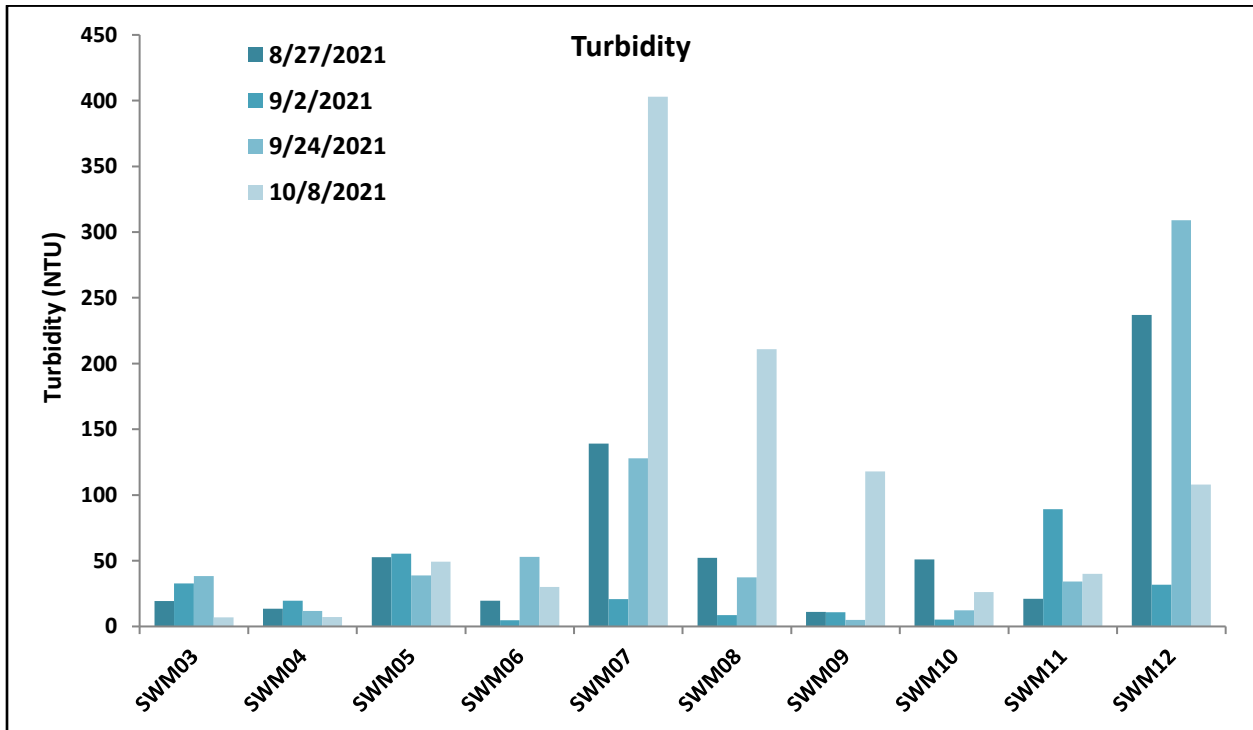
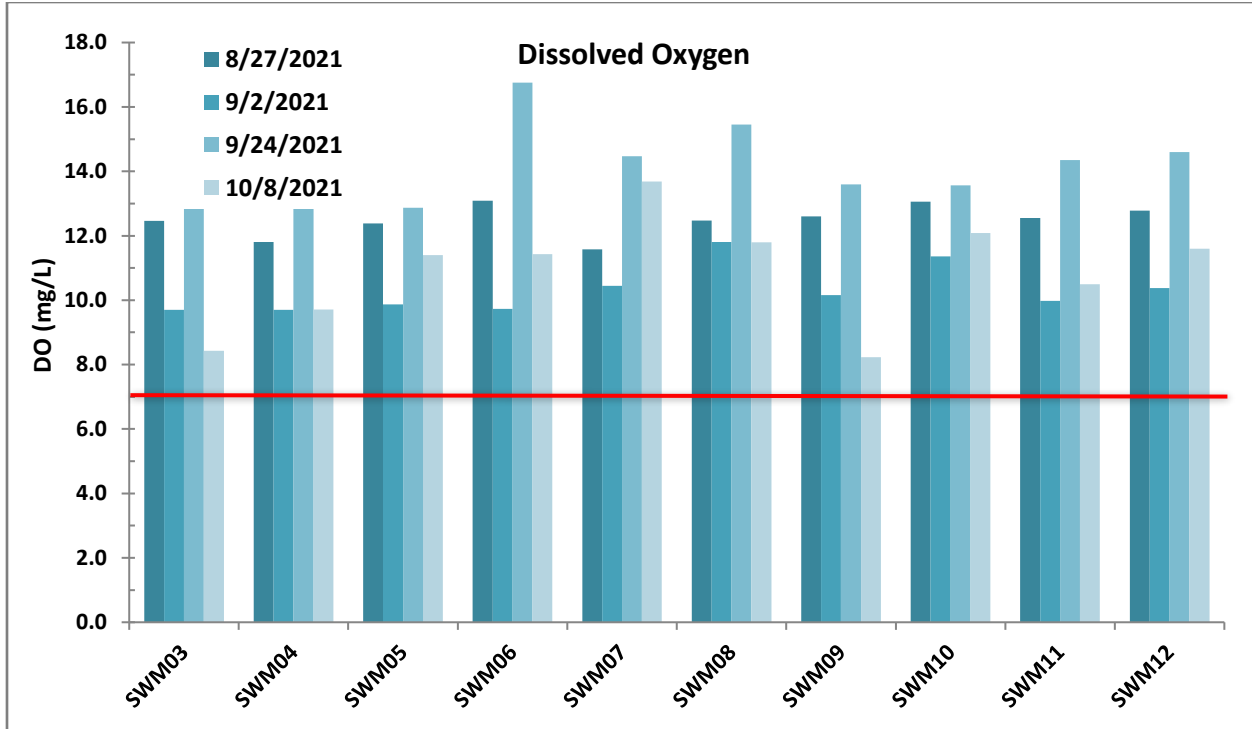
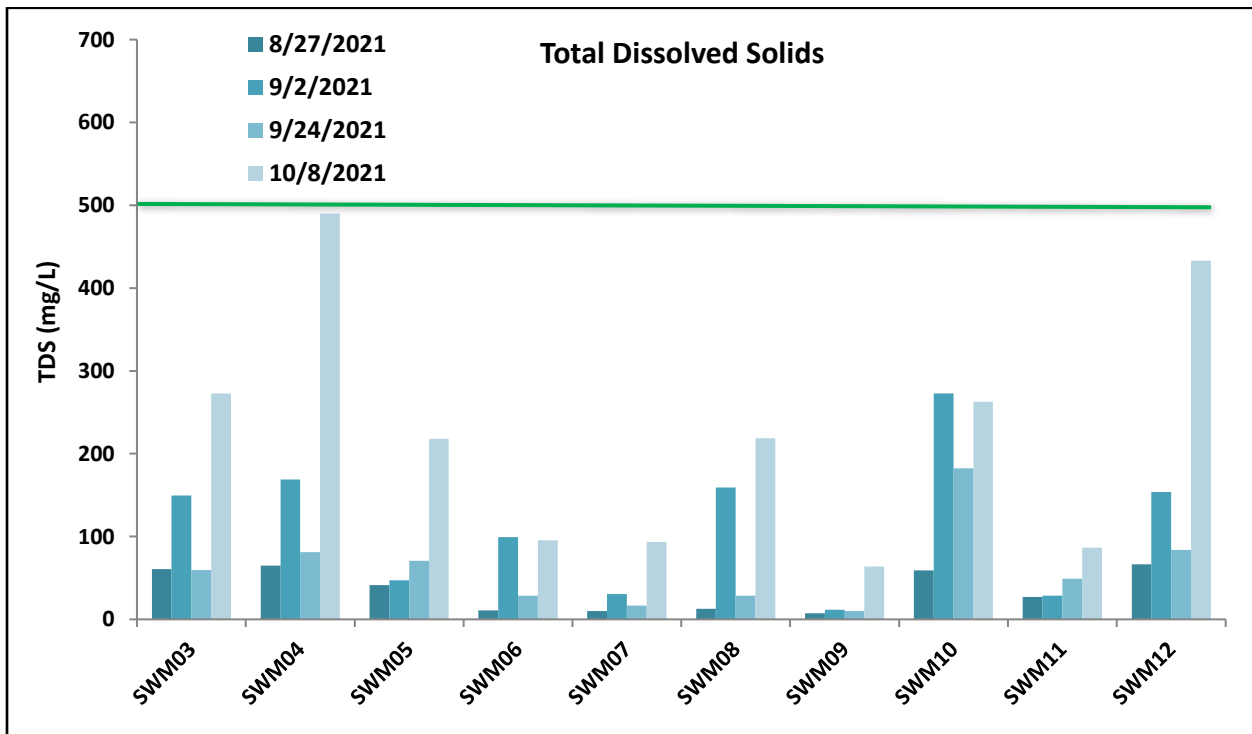


Figure 7. Turbidity Measured in Stormwater Sampled at Monitoring Sites during All Four Events



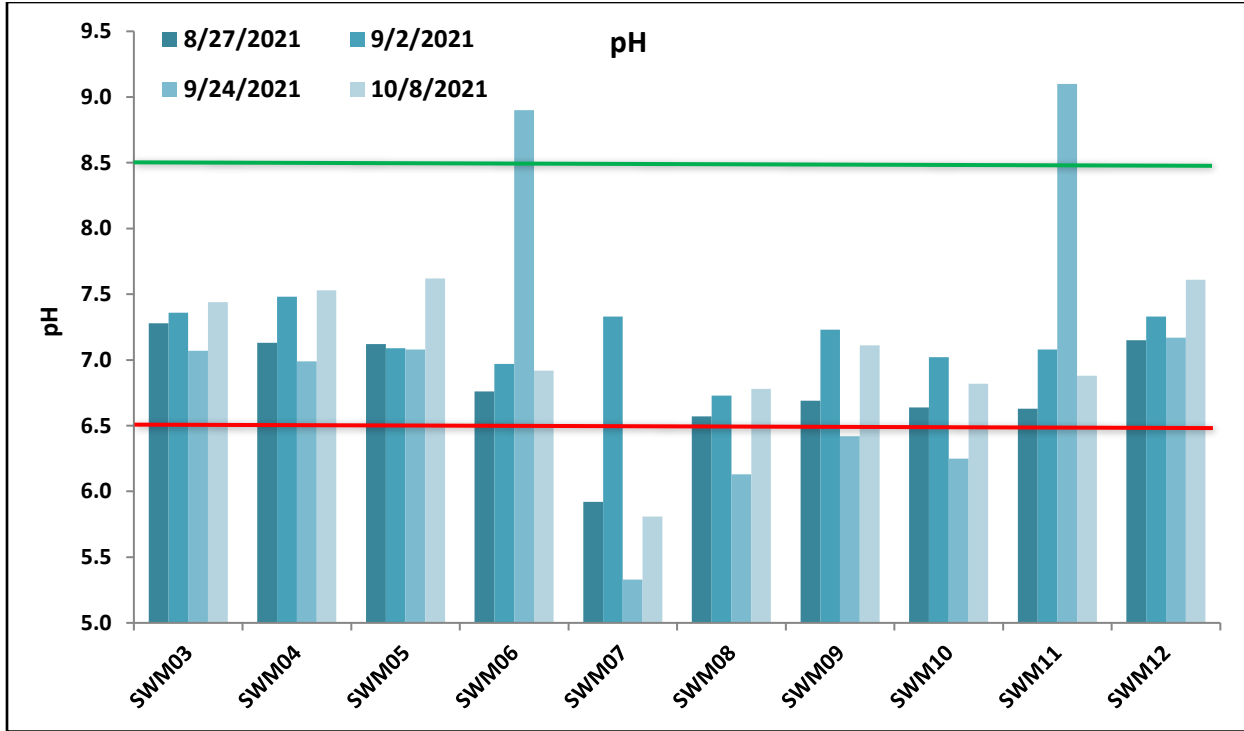
Red line indicates the AWQS dissolved oxygen criteria of ≥ 7 mg/L.

Figure 8. Dissolved Oxygen Measured in Stormwater Sampled at Monitoring Sites during All Four Events



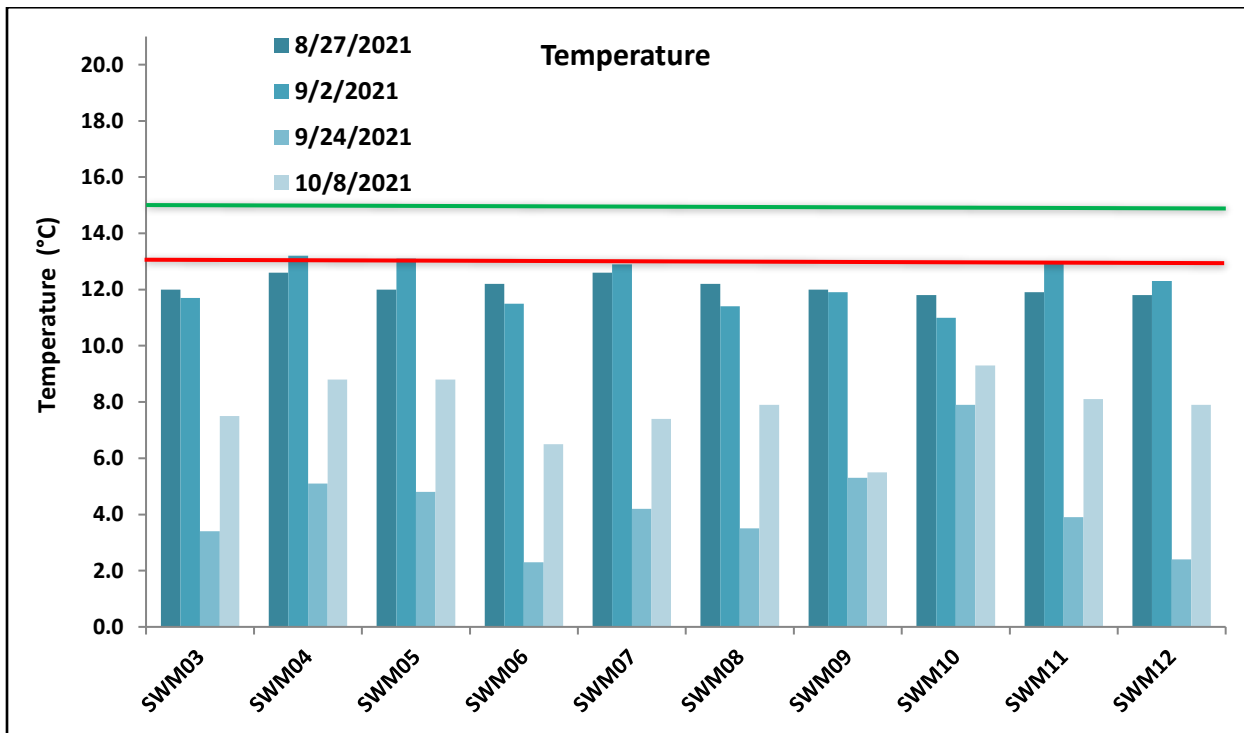
Green line indicates the AWQS total dissolved solids criteria of ≤ 500 mg/L.

Figure 9. Total Dissolved Solids Measured in Stormwater Sampled at Monitoring Sites during All Four Events



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

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



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

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



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

Station	Storm 1 27-Aug-2021	Storm 2 02-Sep-2021	Storm 3 24-Sep-2021	Storm 4 08-Oct-2021	Mean
<i>Flow Rate (CFS)</i>					
SWM03	1.45	0.52	0.64	0.10	0.68
SWM04	0.68	0.39	0.17	0.030	0.32
SWM05	7.27	1.01	0.57	0.014	2.22
SWM06	0.36	0.035	0.17	0.006	0.14
SWM07	0.91	0.002	0.17	0.28	0.34
SWM08	21.8	0.18	4.62	1.72	7.07
SWM09	0.083	0.005	0.031	0.001	0.03
SWM10	1.29	0.18	0.50	0.22	0.55
SWM11	1.34	0.018	0.47	0.060	0.47
SWM12	4.73	3.17	2.24	0.064	2.55
<i>Turbidity (NTU)</i>					
SWM03	19.3	32.8	38.4	7.0	24.4
SWM04	13.4	19.6	11.7	7.2	13.0
SWM05	52.8	55.4	38.9	49.2	49.1
SWM06	19.6	4.8	53.0	30.0	26.8
SWM07	139.0	20.8	128.0	403.0	172.7
SWM08	52.2	8.5	37.4	211.0	77.3
SWM09	11.1	10.8	5.0	118.0	36.2
SWM10	51.0	5.2	12.2	26.1	23.6
SWM11	21.0	89.3	34.1	40.1	46.1
SWM12	237.0	31.7	309.0	108.0	171.4



Table 6. (continued)

Station	Storm 1 27-Aug-2021	Storm 2 02-Sep-2021	Storm 3 24-Sep-2021	Storm 4 08-Oct-2021	Mean
<i>Dissolved Oxygen (mg/L)</i>					
SWM03	12.46	9.70	14.00	8.43	11.15
SWM04	11.81	9.70	13.66	9.71	11.22
SWM05	12.38	9.87	12.87	11.40	11.63
SWM06	13.09	9.73	16.75	11.43	12.75
SWM07	11.58	10.45	14.47	13.68	12.55
SWM08	12.47	11.81	15.45	11.80	12.88
SWM09	12.60	10.16	13.60	8.23	11.15
SWM10	13.06	11.36	13.57	12.08	12.52
SWM11	12.55	9.98	14.35	10.50	11.85
SWM12	12.78	10.38	14.60	11.60	12.34
<i>Total Dissolved Solids (mg/L)</i>					
SWM03	60.8	149.5	59.3	272.9	135.6
SWM04	65.0	168.7	81.0	490.1	201.2
SWM05	41.5	47.1	70.5	217.9	94.3
SWM06	10.8	99.3	28.5	95.3	58.5
SWM07	10.0	30.4	16.5	93.3	37.6
SWM08	12.9	159.3	28.5	218.9	104.9
SWM09	7.5	11.7	9.9	63.8	23.2
SWM10	59.2	272.7	182.3	262.9	194.3
SWM11	27.2	28.6	48.9	86.6	47.8
SWM12	66.5	153.7	83.7	433.3	184.3



Table 6. (continued)

Station	Storm 1 27-Aug-2021	Storm 2 02-Sep-2021	Storm 3 24-Sep-2021	Storm 4 08-Oct-2021	Mean
<i>pH</i>					
SWM03	7.28	7.36	7.07	7.44	7.29
SWM04	7.13	7.48	6.99	7.53	7.28
SWM05	7.12	7.09	7.08	7.62	7.23
SWM06	6.76	6.97	8.90	6.92	7.39
SWM07	5.92	7.33	5.33	5.81	6.10
SWM08	6.57	6.73	6.13	6.78	6.55
SWM09	6.69	7.23	6.42	7.11	6.86
SWM10	6.64	7.02	6.25	6.82	6.68
SWM11	6.63	7.08	9.10	6.88	7.42
SWM12	7.15	7.33	7.17	7.61	7.32
<i>Temperature (°C)</i>					
SWM03	12.0	11.7	3.4	7.5	8.7
SWM04	12.6	13.2	5.1	8.8	9.9
SWM05	12.0	13.1	4.8	8.8	9.7
SWM06	12.2	11.5	2.3	6.5	8.1
SWM07	12.6	12.9	4.2	7.4	9.3
SWM08	12.2	11.4	3.5	7.9	8.8
SWM09	12.0	11.9	5.3	5.5	8.7
SWM10	11.8	11.0	7.9	9.3	10.0
SWM11	11.9	13.0	3.9	8.1	9.2
SWM12	11.8	12.3	2.4	7.9	8.6



Table 7. Concentrations of Microbiological and Conventional Parameters

Station	Storm 1 27-Aug-2021	Storm 2 02-Sep-2021	Storm 3 24-Sep-2021	Storm 4 08-Oct-2021	Mean
Biochemical Oxygen Demand (mg/L)					
SWM03	2.82	2.15	6.19	4.01	3.79
SWM04	2.73	1.82	2.95	3.55	2.76
SWM05	3.90	11.33	5.07	44.00	16.08
SWM06	3.00	2.00	15.39	43.46	15.96
SWM07	17.80	5.54	7.94	29.60	15.22
SWM08	8.06	1.27	6.23	30.50	11.52
SWM09	3.75	1.66	2.71	4.78	3.23
SWM10	19.40	0.80	3.37	16.14	9.93
SWM11	2.82	6.05	3.46	42.92	13.81
SWM12	21.90	10.12	8.63	19.26	14.98
Total Suspended Solids (mg/L)					
SWM03	25.6	24.1	27.1	13.7U	20.9
SWM04	11.4	19.3	7.2U	15.0	12.3
SWM05	45.2	44.0	20.4	31.2	35.2
SWM06	26.1	7.2U	42.3	15.3	21.8
SWM07	181	103	67.3	137	122.0
SWM08	88.6	7.1U	28.8	80.0	50.2
SWM09	11.1	22.3	6.8U	254	72.6
SWM10	44.5	7.2U	7.1U	8.1	14.9
SWM11	19.4	81.7	21.7	17.2	35.0
SWM12	211	207	194.5	40.6	163.2

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



Table 7. (continued)

Station	Storm 1 27-Aug-2021	Storm 2 02-Sep-2021	Storm 3 24-Sep-2021	Storm 4 08-Oct-2021	Geometric Mean
Fecal Coliform (FC/100 mL)					
SWM03	1090	2400	210	9U	224
SWM04	703	818	9	9U	70
SWM05	4900	1900	1064	136	1078
SWM06	520	36	310	6100	435
SWM07	1604	11200	2300	470	2099
SWM08	1279	2800	350	955	1046
SWM09	1234	945	55	9	155
SWM10	1818	45	9	9U	43
SWM11	4300	800	320	2200	1247
SWM12	4900	20000	5100	364	3672

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

Dissolved oxygen (DO) levels are reported in Figure 8 and in Table 6. Measured DO levels were typical for Alaska streams, with all measurements above the AWQS threshold of 7 milligrams/liter (mg/L) (Table 10). Mean DO concentrations across the four sampled storm events ranged from a low of 11.1 mg/L at SWM03 and SWM 09 to a high of 12.9 mg/L at SWM08. The highest measured DO concentrations occurred during Storm 3, which correlates with the colder water temperatures seen during that storm.

Although not required by the monitoring plan, specific conductivity was recorded at each site since it was available on the portable multi-parameter meter and is considered useful for interpretation of stormwater data. Specific conductivity was converted to total dissolved solids (TDS) concentrations so comparisons could be made with the AWQS criteria. TDS concentrations are reported in Figure 9 and in Table 6. Storms 2 and 4 had mean TDS concentrations greater than 100 mg/L when comparing all outfalls. It should also be noted that Storms 2 and 4 were generally lower in flow than other storms in this year's program. Although elevated TDS can be indicative of contaminants, the highest concentrations measured were below 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 for pH are reported in Figure 10 and Table 6, and generally fall within AWQS criteria. Rainfall is often slightly acidic, and the National Atmospheric Deposition Program (NADP) indicates that rainfall in Alaska typically falls with a pH of 5.1 to 5.2 (NADP 2019). Measured pH levels during the 2021 SWM Program varied between outfall locations and storm events, again without a clear pattern in the data. The minimum recorded pH value occurred at SWM07 during Storm 3, and was 5.33, below the AWQS minimum guideline of 6.5 (Table 10) for the Growth and Propagation of Fish, Shellfish, other Aquatic Life and Wildlife. The maximum observed pH value of 9.10 was recorded during Storm 3 at SWM11 and was above the AWQS maximum guideline of 8.5.

Temperature measurements are reported in Figure 11 and in Table 6. Temperature generally decreased with each consecutive monitoring event reflecting the progressively cooler fall weather; however, the 2021 SWM Program was conducted later in the season and included events with snowfall. SWM06 had the lowest mean temperature (8.1°C) of the outfalls monitored in the 2021 Program. SWM10 had the highest mean temperature (10.0°C) of the outfalls monitored. It was actively snowing during Storm 3, resulting in a mean temperature of 4.3°C for that storm event. Due to the late season sampling, most temperature measurements were found to be below the AWQS minimum criterion of 13°C for fish migration routes and rearing areas.

In addition to the standard field measurements, the field team also recorded observations of odor and visible water color, clarity, floatables, deposits or stains, sheens, and debris. An ozone/metallic smell was noticed at SWM10 during the third and fourth sampling events. A hydrocarbon odor was noticed at SWM08 during the fourth sampling event. Observations of water color and clarity were consistent and generally matched those outfalls where high turbidity and TSS were observed. No floatables were noted in the field logs. Some stains (rust) were observed at SWM10 and SWM12, which may be an indication of corrosion of the stormwater piping or is simply the result of high iron content that is often seen in Anchorage streams. Other observations included some garbage-type debris, leaves, sticks, and algae. Other than hydrocarbons and turbidity, no attempt has been made to correlate the visual observations with the conventional or pollutant measurements.

3.2 Conventional Parameters (BOD₅ and TSS)

Biochemical oxygen demand (BOD₅) concentrations from the 2021 SWM Program are reported in Figure 12 and in Table 7. Concentrations ranged from a low of 0.80 mg/L at SWM10 during Storm 2 to a high of 44.0 mg/L measured at SWM05 during Storm 4. At SWM05 during Storm 4, low flow, a slightly musty odor, and brown/orange colored water were indications of excess organic matter than may contribute to the high BOD₅ measurement. For comparison, the maximum recorded BOD₅ concentration in 2020 was 10.6 mg/L, less than one fourth of the 2021 maximum recorded measurement.

Measurements for concentrations of total suspended solids (TSS) are presented in Figure 13 and in Table 7. As noted earlier, TSS levels are generally correlated with turbidity measurements. As with turbidity, TSS concentrations were variable between storms and across the monitoring

corridor, with some outfalls demonstrating consistently low TSS readings while others exhibited spikes in TSS concentrations. Outfalls with individual samples that tested below the detection limit used one half of the detection limit when calculating the mean. Six of the ten outfalls sampled in this year's program have mean TSS concentrations below 50 mg/L, with a low mean TSS concentration of 12.3 mg/L. In contrast, outfalls SWM07 and SWM12 had mean TSS measurements of 122 mg/L and 163 mg/L respectively. At outfall SWM09, the elevated mean TSS reading is driven by a single spike in the data, with a TSS measurement of 254 mg/L for Storm 4. During Storm 4 at SWM09, low flow, high turbidity, and cloudy clarity was documented and may contribute to the high TSS measurement.

3.3 Fecal Coliform

Fecal Coliform measurements are presented in Figure 14 and in Table 7. In general, fecal coliform levels in 2021 fell within average historical ranges and with concentrations below those observed in 2017 and 2018 but slightly above those observed in 2019 and 2020. During Storm 4, SWM03, SWM04, and SWM10 had individual samples test below the detection limit. For these samples, one half of the detection limit was used in the calculation of geometric means. Geometric mean concentrations for fecal coliform measured as part of this year's program ranged from 43 colony forming units per 100 mL (CFU/100mL) to 3,672 CFU/100mL. The outfall with the lowest geometric mean fecal coliform concentration was SWM10 with a concentration of 43 CFU/100mL; outfalls SWM03, SWM04, SWM06, SWM09, and SWM10 also exhibited geometric mean fecal coliform levels below 1,000 CFU/100mL. The highest geometric mean fecal coliform concentrations were found at SWM07 with a concentration of 2,099 CFU/100mL and SWM12 with a concentration of 3,672 CFU/100mL.

The highest measured fecal coliform concentration measured as part of this year's program was 20,000 CFU/100mL at outfall SWM12 during Storm 2. Overall, peak concentrations found in 2021 were decreased from peak measurements made during the 2017 and 2018 monitoring periods but increased from 2019 and 2020 measurements. A previous analysis of fecal coliform in Anchorage streams indicated that the highest loads would most likely occur in August/September in association with peak runoff and rainfall (MOA 2003). Multi-year data collected as part of this SWM Program so far has not supported that conclusion and suggests that the highest fecal coliform levels should be expected in July for these ten specific outfalls. Yearly and seasonal trends are discussed in further detail in Section 3.7.

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

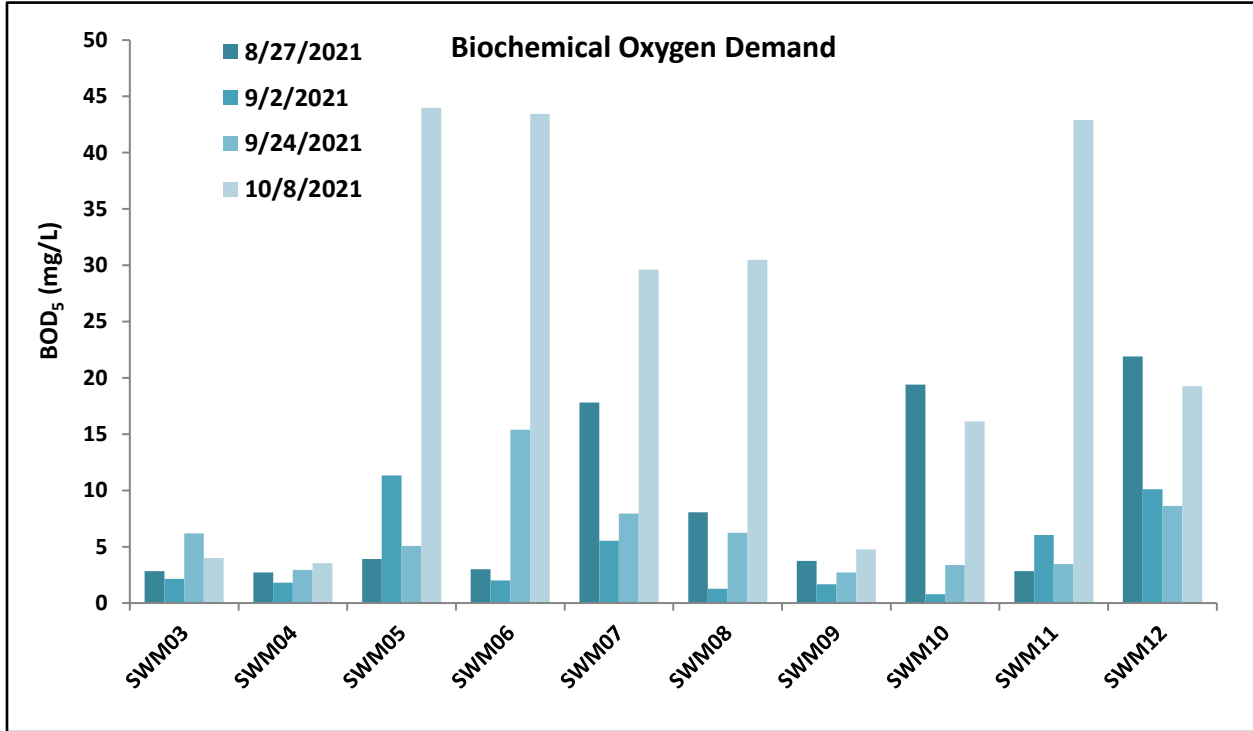


Figure 12. BOD₅ (mg/L) Measured in Stormwater Sampled at Monitoring Sites during All Four Events

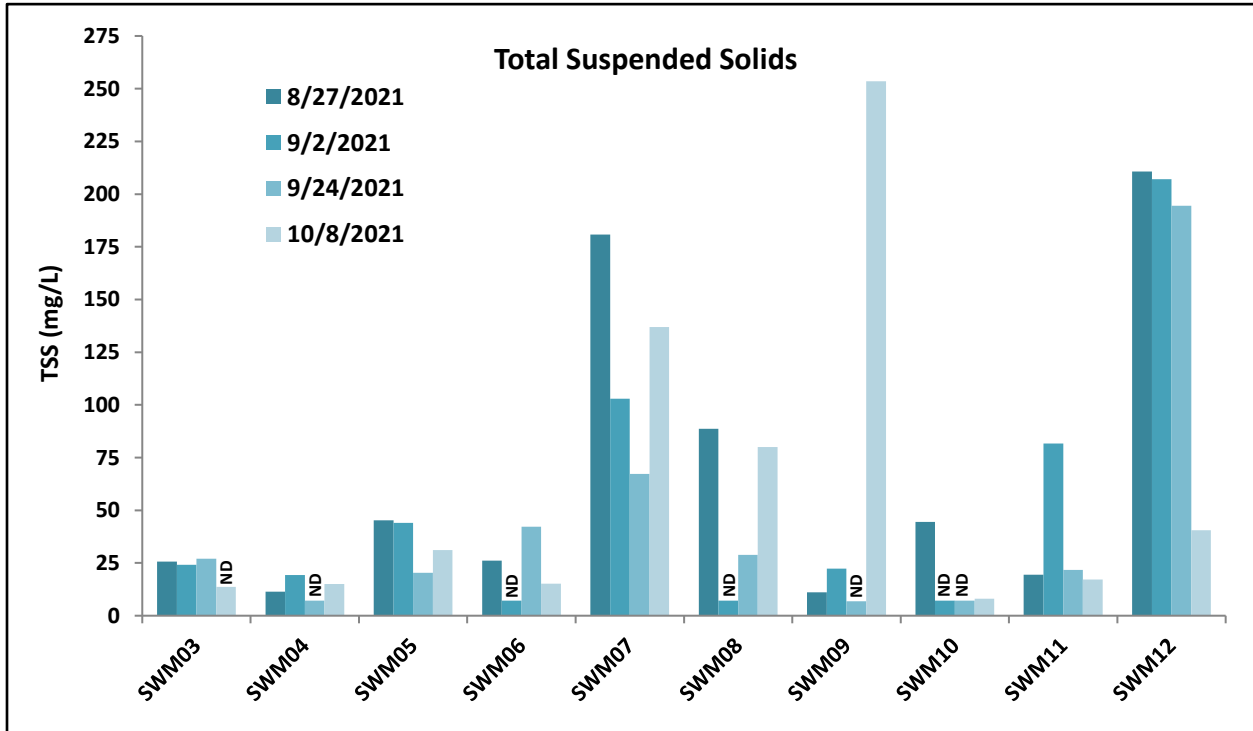
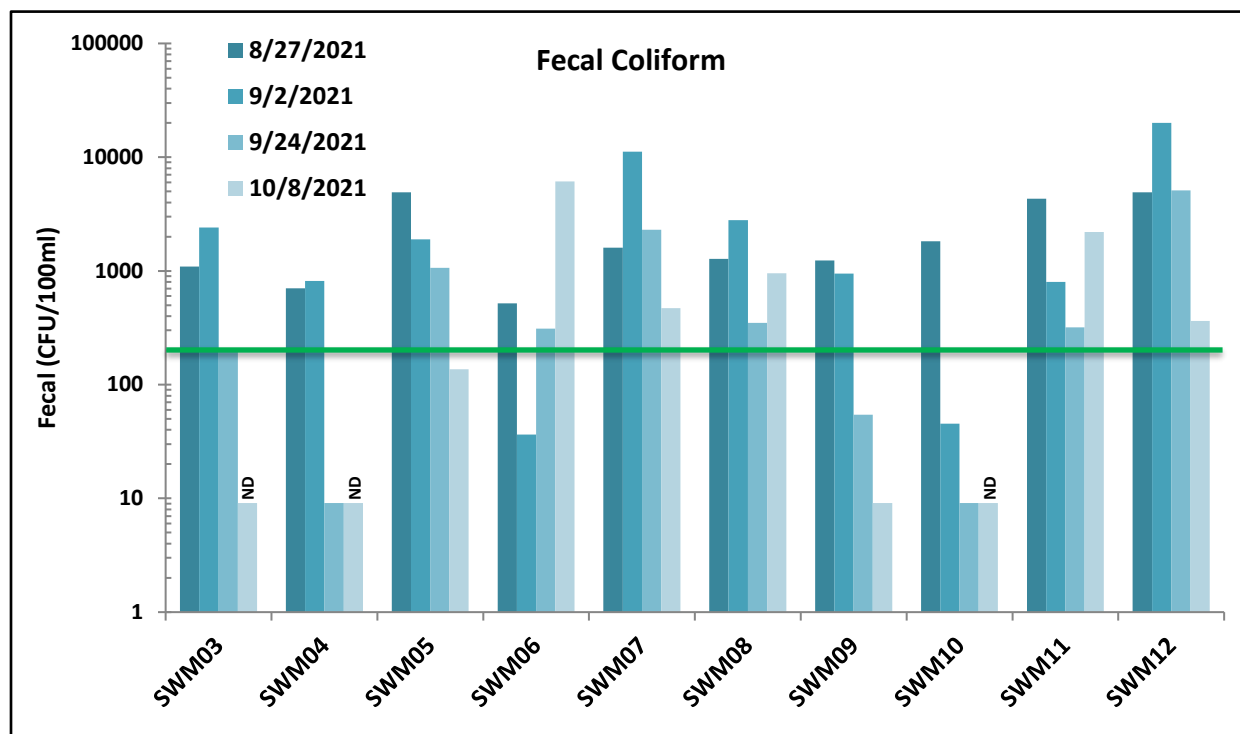


Figure 13. Total Suspended Solids Measured in Stormwater Sampled at Monitoring Sites during All Four Events



Green line indicates upper AWQS fecal coliform limit of 200 CFU/100 mL.

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

3.4 Metals and Hardness

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

Hardness measurements are presented in Table 8 and Figure 15. Hardness is an important parameter for freshwater since it interacts with dissolved metals such as copper to affect metal toxicity thresholds. Mean hardness concentrations ranged from a low of 16.4 mg/L at SWM09 to a high of 116.2 mg/L at SWM12. Typically, within the same waterbody, hardness is inversely correlated to turbidity and TSS, and this was observed in the 2021 monitoring data.

Dissolved copper measurements are presented in Table 8 and Figure 16. Dissolved copper measurements in 2021 were increased relative to 2020 measurements but significantly lower than 2016-2019 measurements. Dissolved copper concentrations ranged from 0.55 micrograms/liter ($\mu\text{g/L}$) at SWM10 during Storm 2 to a high of 13.2 $\mu\text{g/L}$ at SWM07 during Storm 4. SWM10 had the lowest mean copper concentration at 1.61 $\mu\text{g/L}$ while SWM07 had the highest mean copper concentration of 6.50 $\mu\text{g/L}$. The criteria for copper are determined in conjunction with water hardness measurements. For the State of Alaska, the chronic water quality criteria for copper ranges from 4.95 $\mu\text{g/L}$ at a hardness of 50 mg/L to a concentration of 8.96 $\mu\text{g/L}$ at a hardness value of 100 mg/L. The AWQS criteria applies to the receiving waters and is used for comparison purposes only when evaluating stormwater.



Table 8. Concentrations of Hardness and Dissolved Copper.

Station	Storm 1 27-Aug-2021	Storm 2 02-Sep-2021	Storm 3 24-Sep-2021	Storm 4 08-Oct-2021	Mean
<i>Hardness (mg/L)</i>					
SWM03	39.21	81.77	38.01	188	86.7
SWM04	37.35	89.15	42.36	284.47	113.3
SWM05	25.33	27.92	38.85	140.81	58.2
SWM06	7.91	60.85	19.38	55.67	36.0
SWM07	26.39	22.84	14.96	54.69	29.7
SWM08	10.95	67.11	14.46	97.81	47.6
SWM09	5.16	8.33	6.05	46	16.4
SWM10	37.74	130.6	94.06	135.66	99.5
SWM11	18.44	27.51	18.68	53.95	29.6
SWM12	59.39	95.87	58.01	251.51	116.2
<i>Dissolved Copper (µg/L)</i>					
SWM03	2.33	2.88	4.51	3.16	3.22
SWM04	2.75	2.20	4.42	3.45	3.21
SWM05	2.84	2.42	4.75	6.04	4.01
SWM06	0.86	2.35	2.64	7.25	3.28
SWM07	2.59	4.43	5.77	13.20	6.50
SWM08	1.57	1.32	4.48	7.17	3.64
SWM09	1.63	2.28	2.13	1.78	1.96
SWM10	1.33	0.55	2.98	1.59	1.61
SWM11	2.54	3.17	1.99	9.40	4.28
SWM12	3.70	4.66	4.32	5.08	4.44

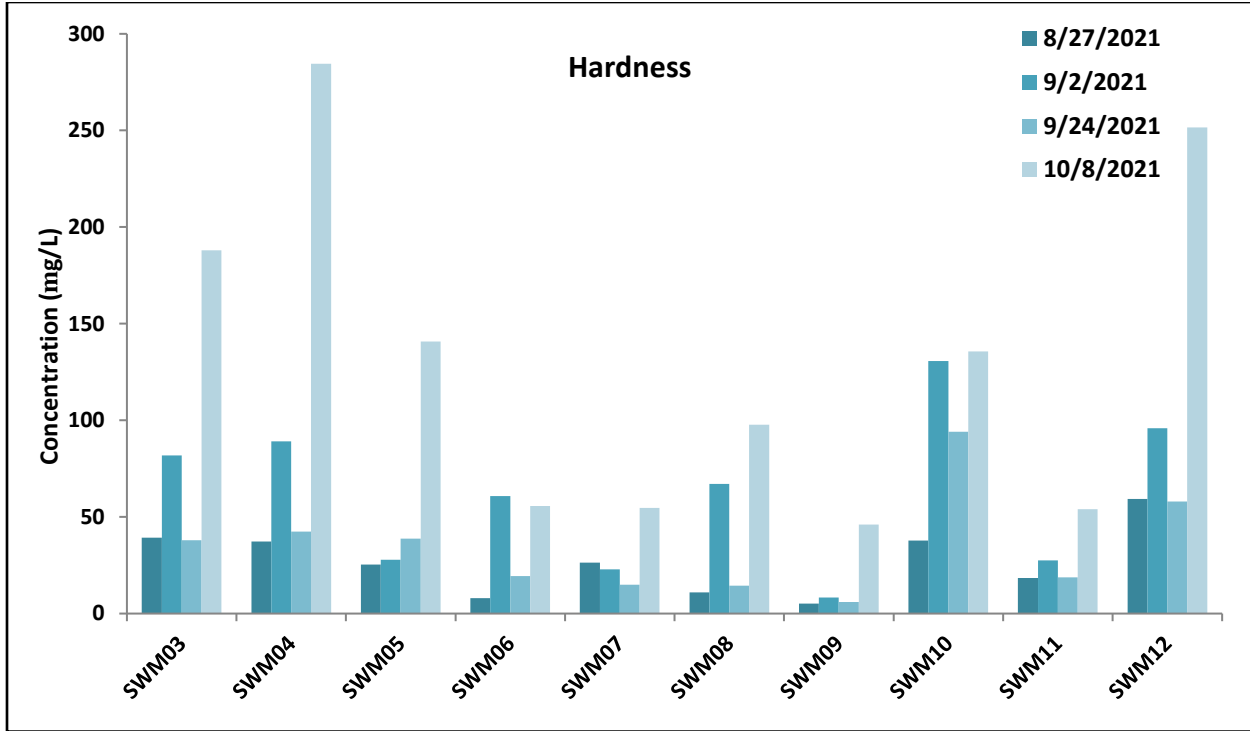
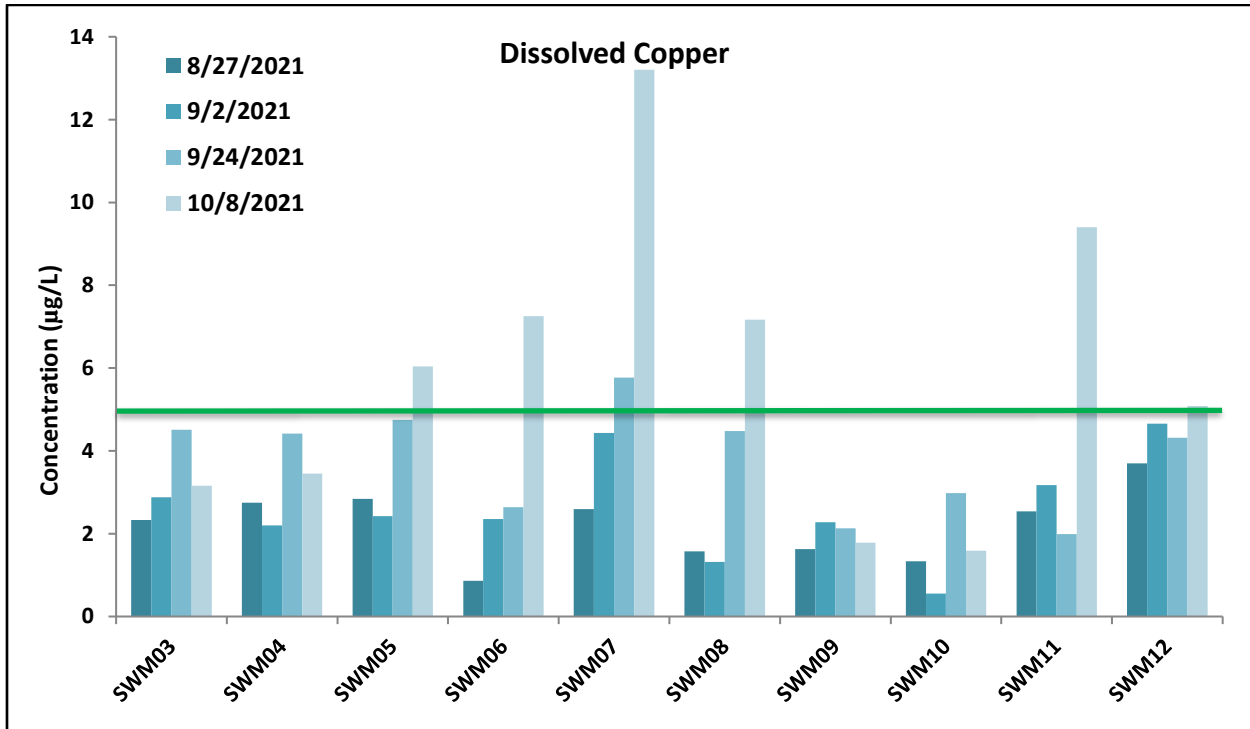


Figure 15. Water Hardness (mg/L) Measured in Stormwater Samples



Green line indicates the upper AWQS chronic copper limit of 4.95 µg/L based on hardness value of 50 mg/L in the receiving water.

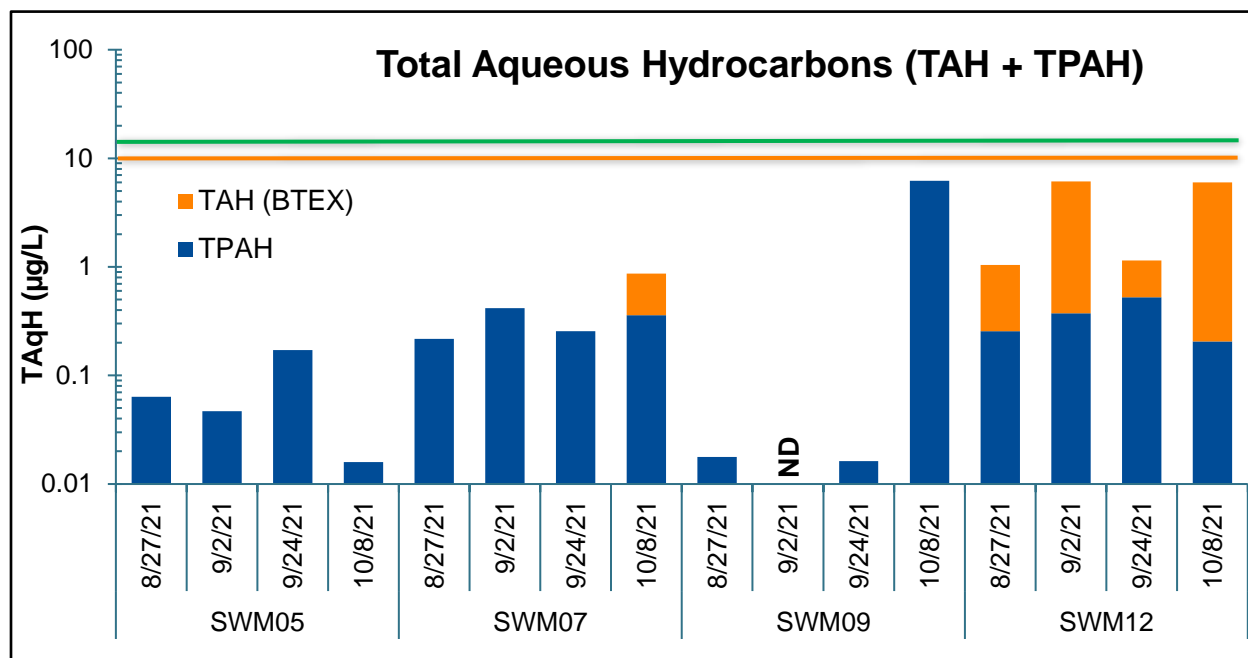
Figure 16. Dissolved Copper (µg/L) Measured in Stormwater Samples

3.5 Hydrocarbons

Total aromatic hydrocarbons (TAH) and total polycyclic aromatic hydrocarbons (TPAH) were measured as part of the 2021 SWM Program at four selected outfalls: SWM05, SWM07, SWM09, and SWM12. In this year's program, TPAH constituents were detected at all four monitoring sites, while TAH constituents were detected at two of the monitoring sites: SWM07 and SWM09. For this study TAH is reported as the summation of detected concentrations of benzene, ethylbenzene, toluene, and xylenes (BTEX). Since 2020, dichlorobenzene and chlorobenzene are not analyzed due to reclassification of these parameters by ADEC. Hydrocarbon measurements are presented in Figure 17 and in Table 9. All samples collected fell within the AWQS criteria (Table 10) of 10 µg/L for TAH and 15 µg/L for total aqueous hydrocarbons (TAqH), representing the summation of TAH and TPAH.

TAH (BTEX) was detected in five samples in the 2021 monitoring year, increased from the four samples where BTEX were detected in 2020. In this year's program, BTEX was detected in one sample collected from SWM07 and all four samples collected from SWM12. BTEX concentrations detected ranged from 0.51 µg/L at SWM07 to 5.79 µg/L at SWM12. Since 2017, when sampling of SWM12 began, this year is the first time BTEX has been observed at that outfall. Toluene was the most commonly detected BTEX constituent in each of these samples. At SWM12, Ethylbenzene, o-Xylene, and P&M-Xylene were also detected during Storm 2, while o-Xylene, and P&M-Xylene were also detected during Storm 4. For comparison, the 2021 BTEX peak measurements are significantly increased from peak concentrations detected in the 2020 monitoring year but decreased from 2019 peak concentrations.

TPAH was detected in all but one sample (SWM09 during Storm 2) in the 2021 monitoring year and many of the data points were qualified by the laboratory as estimated low due to poor recoveries in the matrix spike/matrix spike duplicates (MS/MSD), especially for Storms 2 and 4. TPAH concentrations detected ranged from 0.02 µg/L at SWM05 to 6.22 µg/L at SWM09. For comparison, the 2021 TPAH peak measurements are similar to peak concentrations detected in 2020 but decreased from 2019 peak concentrations. TPAH constituent concentrations varied between storm events and between the four outfalls tested. Across the outfalls, the most commonly detected TPAH compounds were combustion-related compounds including fluoranthene, phenanthrene, and pyrene.



Orange line indicates the upper AWQS TAH limit of 10 µg/L and green line indicates the upper AWQS TAqH limit of 15 µg/L.

Figure 17. Total Aqueous Hydrocarbons (TAqH = TAH + TPAH) Measured in Stormwater Sampled at Monitoring Sites during All Four Events

The 2021 hydrocarbon detection is increased from 2020, with a significant increase in detection at SWM12.

Contaminants, particularly TPAH, can be present in higher levels early in the storm runoff period as result of the first flush of accumulated contaminants from roadways and other urban surfaces. This was not observed in the 2021 SWM Program, which could be attributed to a late season sampling, low precipitation intensity over the monitoring corridor, and not capturing the storm events that occurring before the monitoring period, as depicted in the precipitation charts presented in Figure 4 and Figure 5.

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



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

	SWM05 - OGS (Yes)				SWM07 - OGS (No)				SWM09 - OGS (Yes)				SWM12 - OGS (No)			
	8/27/21	9/2/21	9/24/21	10/8/21	8/27/21	9/2/21	9/24/21	10/8/21	8/27/21	9/2/21	9/24/21	10/8/21	8/27/21	9/2/21	9/24/21	10/8/21
Polycyclic Aromatic Hydrocarbons (µg/L)																
Acenaphthene	0.0236UJ-	0.0232UJ-	0.0232U	0.0255UJ-	0.0236UJ-	0.0236UJ-	0.0227U	0.0236UJ-	0.0245UJ-	0.0236UJ-	0.0227U	0.0189J-	0.0236UJ-	0.024UJ-	0.024U	0.0255UJ-
Acenaphthylene	0.0236U	0.0232UJ-	0.0232U	0.0255UJ-	0.0236U	0.0236UJ-	0.0227U	0.0236UJ-	0.0245U	0.0236UJ-	0.0227U	0.0236UJ-	0.0236U	0.024UJ-	0.024U	0.0255UJ-
Anthracene	0.0236UJ-	0.0232UJ-	0.0232UJ-	0.0255UJ-	0.0236UJ-	0.0236UJ-	0.0227UJ-	0.0236UJ-	0.0245UJ-	0.0236UJ-	0.0227UJ-	0.0591J-	0.0236UJ-	0.024UJ-	0.024UJ-	0.0255UJ-
Benzo(a)anthracene	0.0236UJ-	0.0232UJ-	0.0232UJ-	0.0255UJ-	0.0236UJ-	0.0236UJ-	0.0227UJ-	0.0236UJ-	0.0245UJ-	0.0236UJ-	0.0227UJ-	0.404J-	0.0236UJ-	0.024UJ-	0.0225J-	0.0255UJ-
Benzo(a)pyrene	0.00945UJ-	0.00925UJ-	0.00925UJ-	0.0102UJ-	0.00945UJ-	0.00945UJ-	0.0091UJ-	0.00945UJ-	0.0098UJ-	0.00945UJ-	0.0091UJ-	0.585J-	0.00945UJ-	0.0096UJ-	0.0096UJ-	0.0102UJ-
Benzo(b)fluoranthene	0.0236UJ-	0.0232UJ-	0.0232UJ-	0.0255UJ-	0.0318J-	0.0377J-	0.0227UJ-	0.0236UJ-	0.0245UJ-	0.0236UJ-	0.0227UJ-	0.879J-	0.0401J-	0.0404J-	0.0596J-	0.0255UJ-
Benzo(g,h,i)perylene	0.0236UJ-	0.0232UJ-	0.017J-	0.0255UJ-	0.0301J-	0.058J-	0.0274J-	0.0467J-	0.0245UJ-	0.0236UJ-	0.0227UJ-	0.53J-	0.0347J-	0.0577J-	0.0624J-	0.0221J-
Benzo(k)fluoranthene	0.0236UJ-	0.0232UJ-	0.0232UJ-	0.0255UJ-	0.0236UJ-	0.0236UJ-	0.0227UJ-	0.0236UJ-	0.0245UJ-	0.0236UJ-	0.0227UJ-	0.31J-	0.0236UJ-	0.024UJ-	0.024UJ-	0.0255UJ-
Chrysene	0.0236UJ-	0.0232UJ-	0.0273J-	0.0255UJ-	0.0223J-	0.0702J-	0.0382J-	0.0194J-	0.0245UJ-	0.0236UJ-	0.0227UJ-	0.582J-	0.0231J-	0.0296J-	0.0367J-	0.0255UJ-
Dibenzo(a,h)anthracene	0.00945UJ-	0.00925UJ-	0.00925UJ-	0.0102UJ-	0.00945J-	0.00945UJ-	0.0091UJ-	0.00945UJ-	0.0098UJ-	0.00945UJ-	0.0091UJ-	0.113J-	0.00945UJ-	0.0096UJ-	0.0096UJ-	0.0102UJ-
Fluoranthene	0.0194J-	0.0168J-	0.0324J-	0.0255UJ-	0.0441J-	0.0722J-	0.0441J-	0.0662J-	0.0245UJ-	0.0236UJ-	0.0227UJ-	1.03J-	0.0502J-	0.0725J-	0.0858J-	0.035J-
Fluorene	0.0236UJ-	0.0232UJ-	0.0232U	0.0255UJ-	0.0236UJ-	0.0236UJ-	0.0227U	0.0236UJ-	0.0245UJ-	0.0236UJ-	0.0227U	0.0211J-	0.0236UJ-	0.024UJ-	0.024U	0.0255UJ-
Indeno(1,2,3-cd)pyrene	0.0236UJ-	0.0232UJ-	0.0232UJ-	0.0255UJ-	0.0236UJ-	0.0189J-	0.0227UJ-	0.0236UJ-	0.0245UJ-	0.0236UJ-	0.0227UJ-	0.434J-	0.0163J-	0.0205J-	0.0251J-	0.0255UJ-
Naphthalene	0.0471UJ-	0.0463UJ-	0.0347J	0.051UJ-	0.0471UJ-	0.0471UJ-	0.034J	0.0466J-	0.049UJ-	0.0471UJ-	0.0454U	0.0319J-	0.0471UJ-	0.0481UJ-	0.0432J	0.056J-
Phenanthrene	0.0248J-	0.0141J-	0.0302J	0.0159J-	0.0341J-	0.054J-	0.0505	0.076J-	0.0177J-	0.0236UJ-	0.0163J	0.358J-	0.0322J-	0.0439J-	0.0735	0.0441J-
Pyrene	0.0195J-	0.0161J-	0.0299J-	0.0255UJ-	0.0547J-	0.107J-	0.0622J-	0.103J-	0.0245UJ-	0.0236UJ-	0.0227UJ-	0.864J-	0.0582J-	0.108J-	0.117J-	0.0481J-
Volatile Aromatic Hydrocarbons (µg/L)																
Benzene	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U	0.2U
Ethylbenzene	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.316J	0.5U
o-Xylene	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.702J	0.5U
P&M-Xylene	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1U	1.66J	1U
Toluene	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.5U	0.512J	0.5U	0.5U	0.5U	0.5U	0.5U	0.79J	3.060	0.62J
Hydrocarbon Summary Parameters (µg/L)																
TPAH	0.0637	0.047	0.1715	0.0159	0.2171	0.418	0.2564	0.3579	0.0177	ND	0.0163	6.22	0.2548	0.3726	0.5258	0.2053
TAH as BETX	ND	ND	ND	ND	ND	ND	ND	0.512	ND	ND	ND	ND	0.79	5.738	0.62	5.786
TAQH (TPAH + TAH)	0.0637	0.047	0.1715	0.0159	0.2171	0.418	0.2564	0.8699	0.0177	ND	0.0163	6.22	1.0448	6.1106	1.1458	5.9913

Footnotes: U = Not detected at the reporting limit. J = Estimated value below the detection limit. J- = Estimated value may be biased low. UJ- = Not detected at the reporting limit but maybe be biased low. ND = no concentration detected in any analyte tested.

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



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

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



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

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



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

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

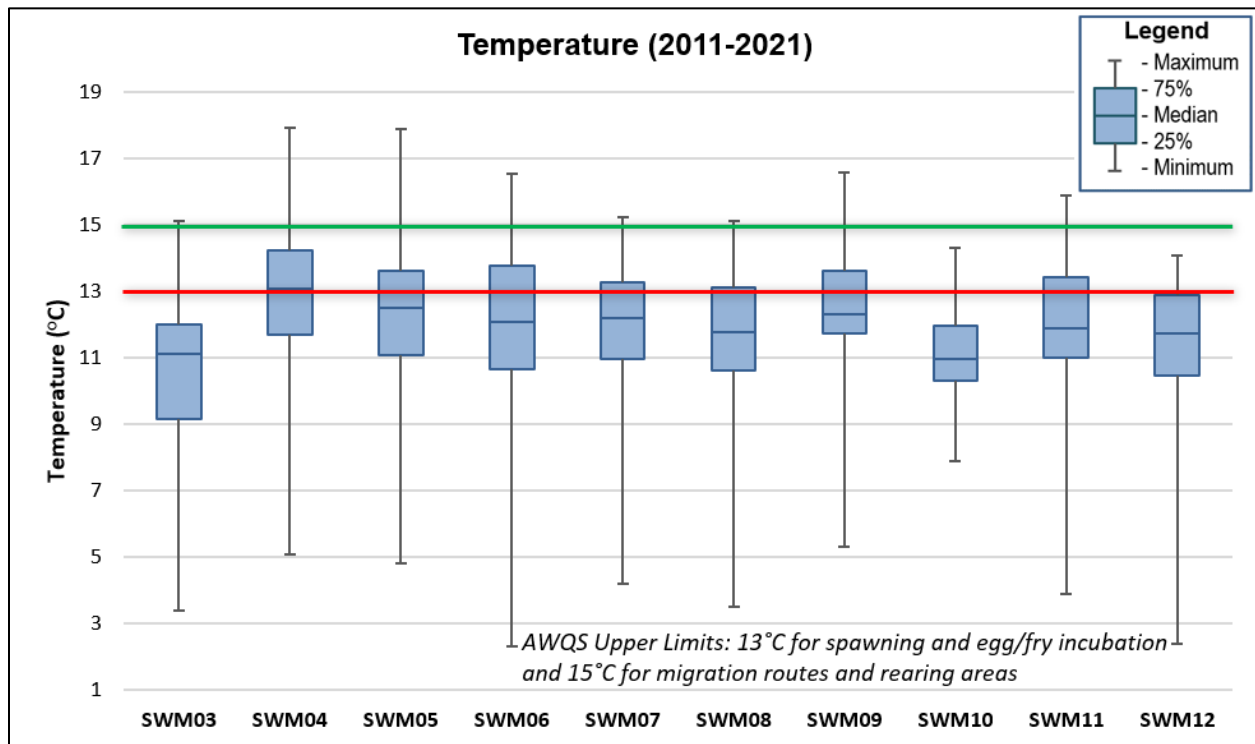


3.6 Multi-Year Site Trends

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

The stormwater outfall sampling conducted in 2021 represented the eleventh year of sampling under the SWM Program. These 11 years of sampling provide a data record for preliminary investigation of differences between the monitoring sites included in the program. General site differences were investigated through statistical analysis to compare outfalls where applicable for parameters that follow normal or log-normal distributions. Box plots have been prepared for visualization of the data record for each parameter tested (Figures 18-26). The box plots depict the minimum, maximum, median, 25th-percentile, and 75th-percentile of the data collected over the ten-year monitoring period. It should be noted that outfalls SWM11 and SWM12 were added to the SWM Program in 2017 and therefore have shorter data records than the other outfalls. It is important to note that due to the relatively short data record, caution should be warranted when comparing outfalls. Given evolving land uses and myriad other influences, it can be difficult to compare multivariate environmental systems based on short data records.

Figure 18. Station Box Plot of Temperature by Outfall, All Data 2011 through 2021

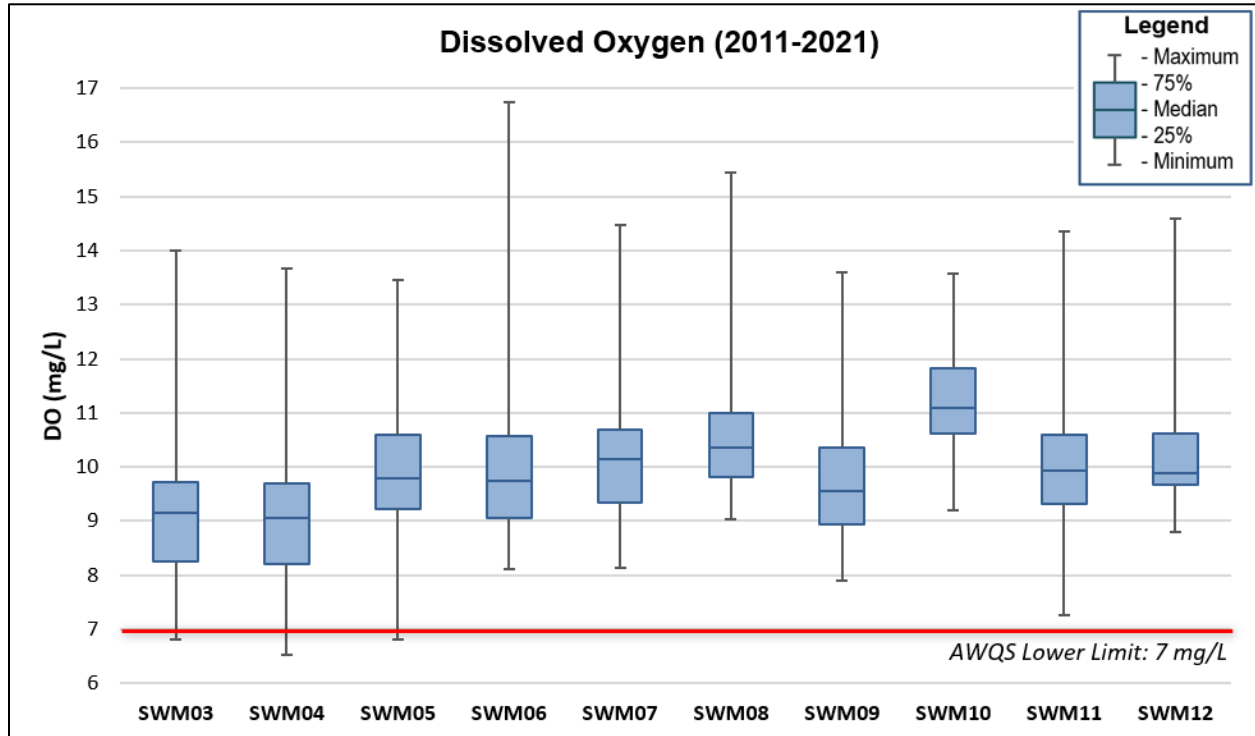


Review of the SWM Program data record indicates that there are significant differences in outfall temperature across at least some of the 10 outfalls tested (ANOVA p-value of 0.0013). cursory observation of the box plot data (Figure 18) indicates that temperature readings tend to be lower at SWM03 and SWM10 than at the other outfalls. Similarly, SWM04 appears to trend warmer than other outfalls, and has a median temperature around two degrees Celsius higher than SWM03



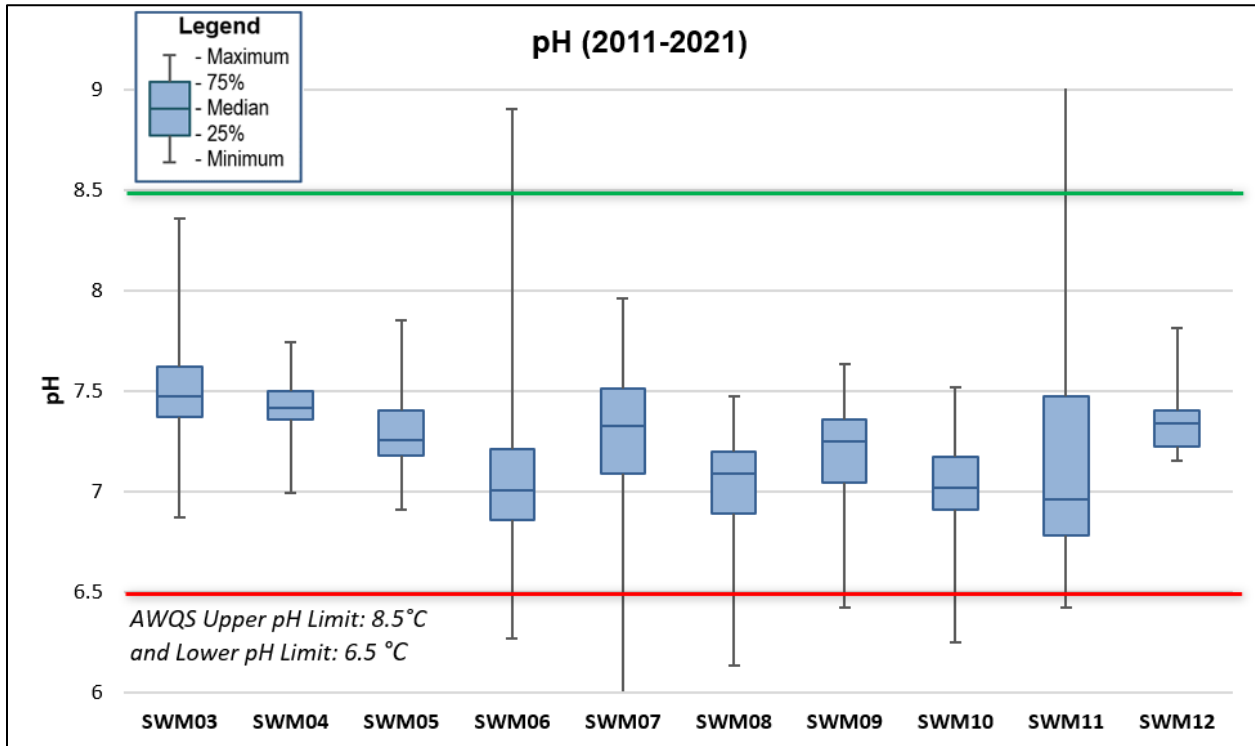
and SWM10. These differences were found to be statistically significant (single factor ANOVA P-value of 8.35×10^{-8}), supporting the conclusion that there are significant, persistent differences in temperature between at least some of the outfalls.

Figure 19. Station Box Plot of Dissolved Oxygen by Outfall, All Data 2011 through 2021



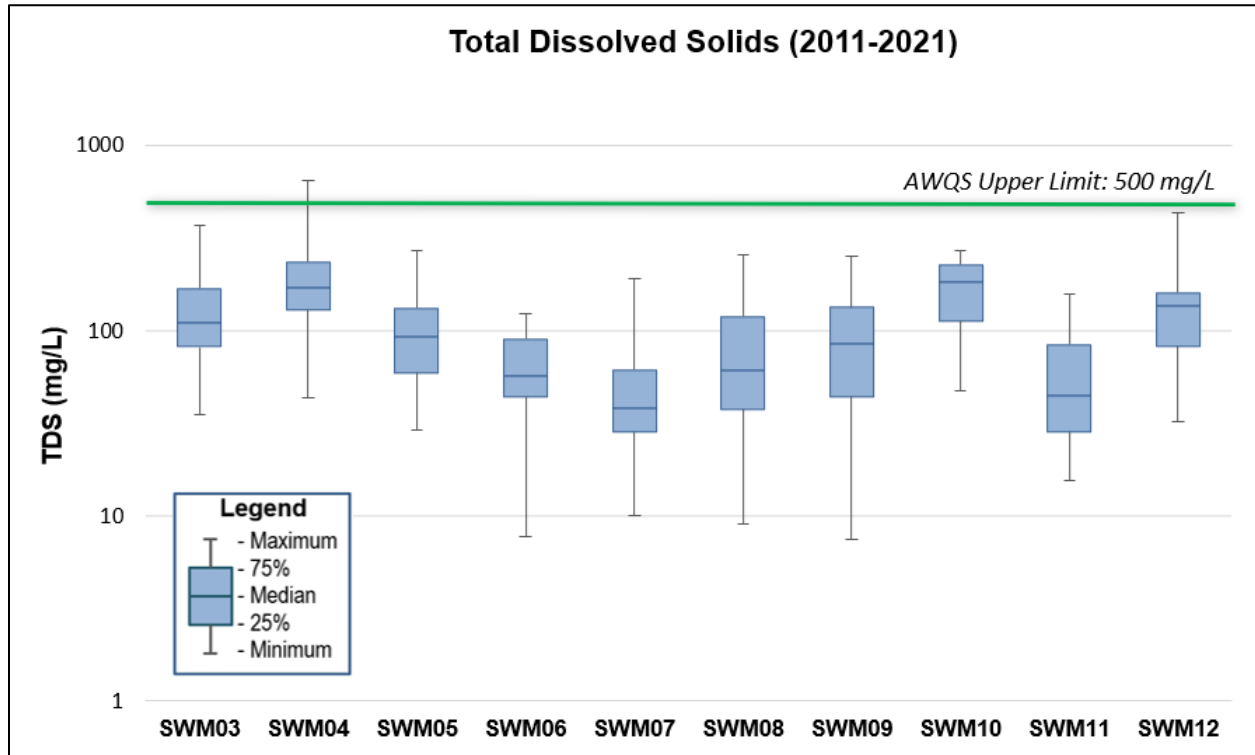
The box plot data record for DO is presented in Figure 19. Like temperature, DO concentrations are assumed to follow a normal distribution at each site. There is statistically significant variation between outfall sites (ANOVA p-value of 3.68×10^{-15}), but all sites generally are above the AWQS limit of 7mg/L. Throughout the data record, SWM10 has the greatest median DO concentration of 11.1 mg/L and is statistically distinct from each of the other outfall sites. The elevated DO at SWM10 is potentially due to persistently lower water temperatures and turbulent flow in the outfall pipe prior to discharge.

Figure 20. Station Box Plot of pH by Outfall, All Data 2011 through 2021



The median pH at outfalls SWM06, SWM8, SWM10, and SWM11 trend lower than at other outfalls with median values ranging from 6.96 to 7.09 (Figure 20). These four outfalls are statistically indistinguishable from one another with regards to mean pH (single factor ANOVA, P value of 0.30). There were several isolated individual measurements in the data record below the AWQS lower limit of 6.5 pH units, including a total of six measurements in 2021, provided in Table 6. SWM07 contains three of the six 2021 pH measurements under 6.5 pH units. These deviations below a pH of 6.5 appear to be isolated and not part of a broader trend as the long-running median for SWM07 is a pH of 7.33. For the first time for this data record, two samples collected this year exceeded the AWQS pH criterion of 8.5 pH units. During Storm 3, SWM06 and SWM11 recorded pH values of 8.90 and 9.10 respectively. These deviations above a pH of 8.5 appear to be isolated and likely not part of a broader trend as a correlation between storm event, outfall, or long-running median could be identified.

Figure 21. Station Box Plot of Total Dissolved Solids by Outfall, All Data 2011 through 2021



The data record for TDS is presented in Figure 21. TDS levels trend highest at SWM04 and SWM10 with median values of 170.0 and 184.0 mg/L respectively. It should be noted that median TDS levels for both SWM04 and SWM10 fall well below the AWQS criterion of 500mg/L. Only a single sample in the data record, collected in 2013 at SWM04, has ever exceeded the AWQS threshold. The comparatively elevated TDS at SWM04 and SWM10 may be an indication of pollutants such as fertilizer, salts, or organic ions flushing from the contributing drainage basins. Both outfalls drain primarily residential areas.

The box plots for TSS and turbidity are presented in Figure 22 and Figure 23 respectively. Over the record of monitoring, both TSS and turbidity have been highly variable between storms and locations, although there is a general positive correlation between TSS and turbidity visible in the box plots. The highest median TSS and turbidity concentrations were detected at SWM07 and at SWM12, with median TSS and turbidity concentrations over double those of any of the other outfalls in the data record. Further statistical analysis was not performed. Outfall SWM10 exhibited the lowest median TSS and turbidity of the outfalls included in the 2021 SWM Program.

Figure 22. Station Box Plot of Total Suspended Solids by Outfall, All Data 2011 through 2021

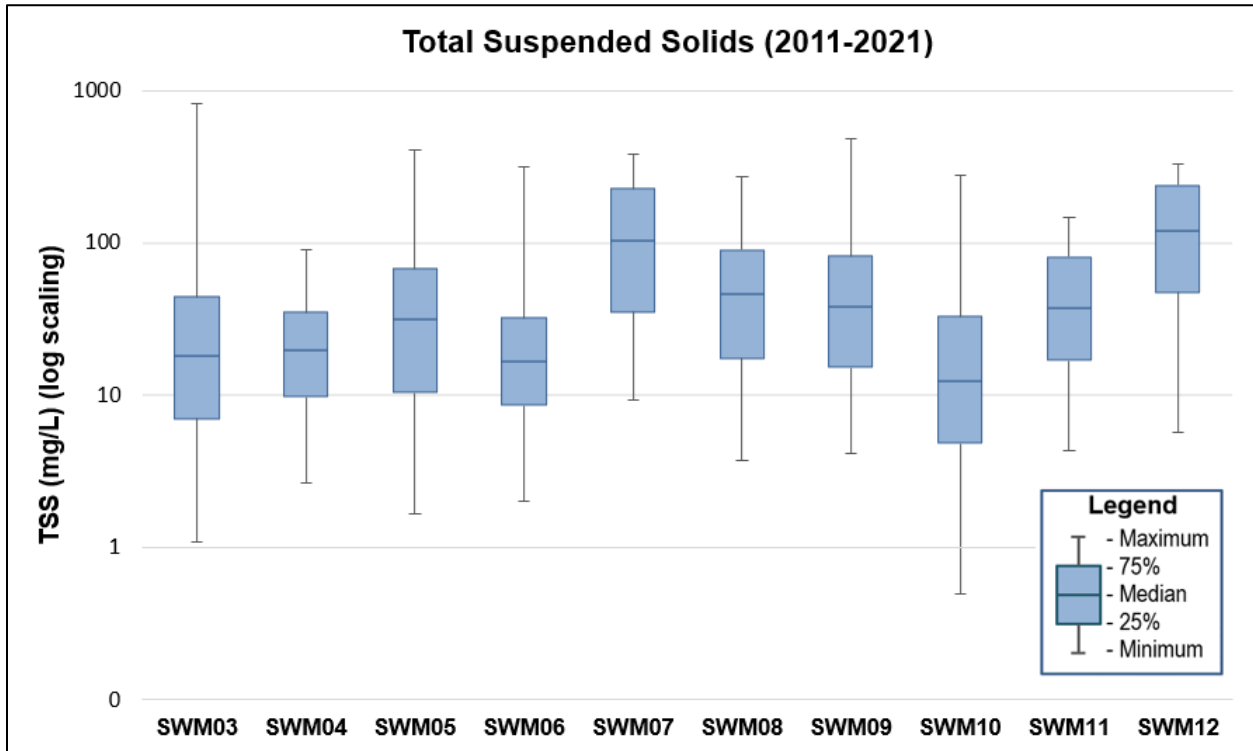


Figure 23. Station Box Plot of Turbidity by Outfall, All Data 2011 through 2021

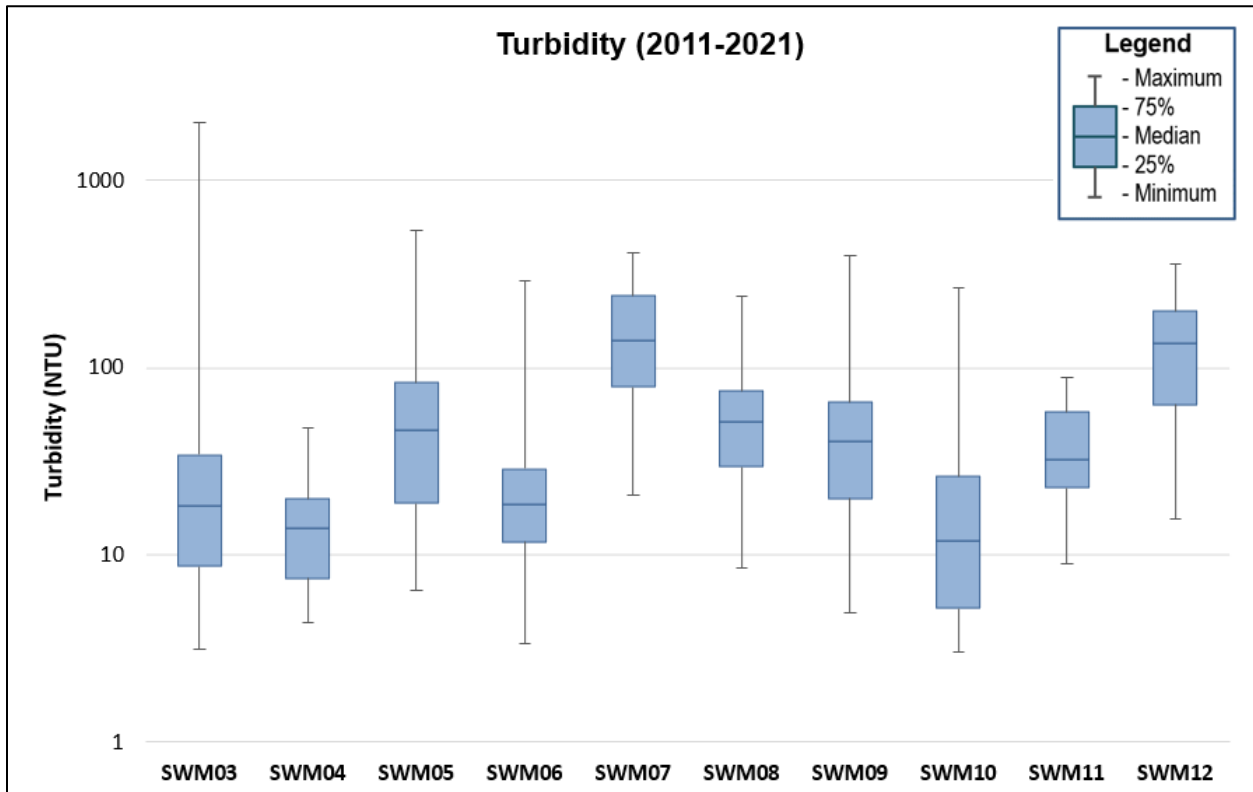
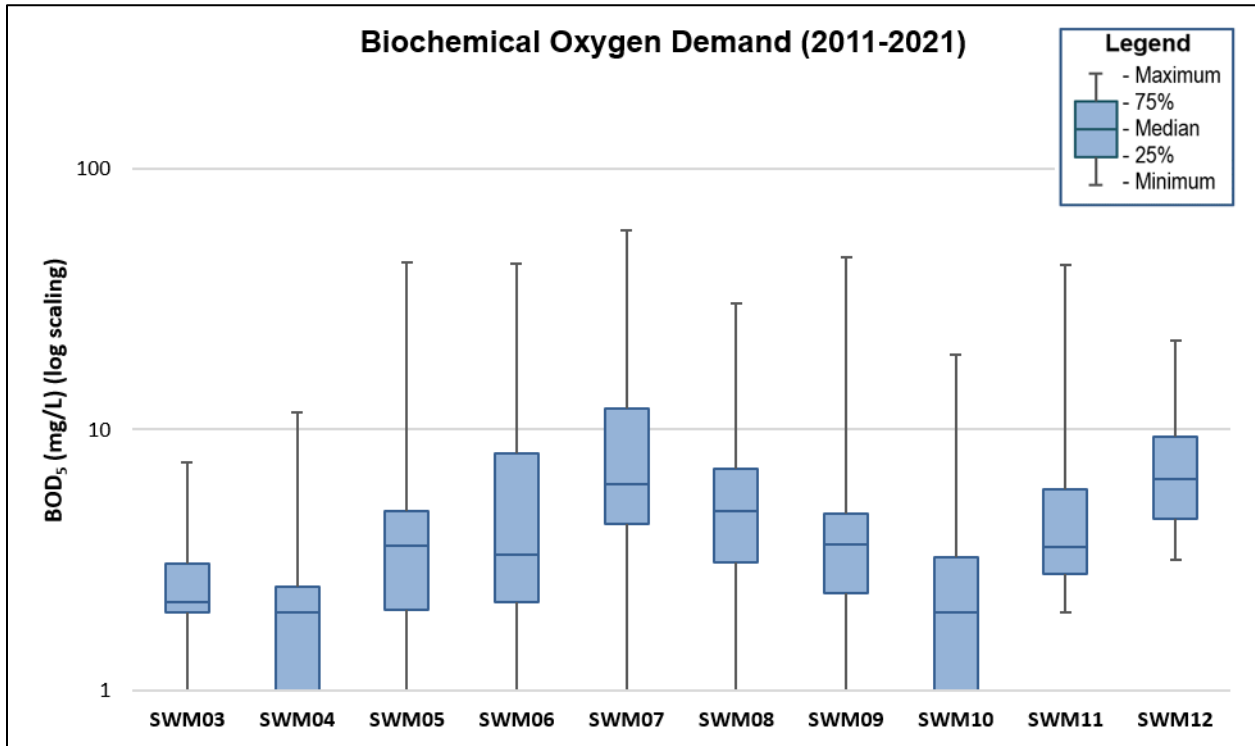
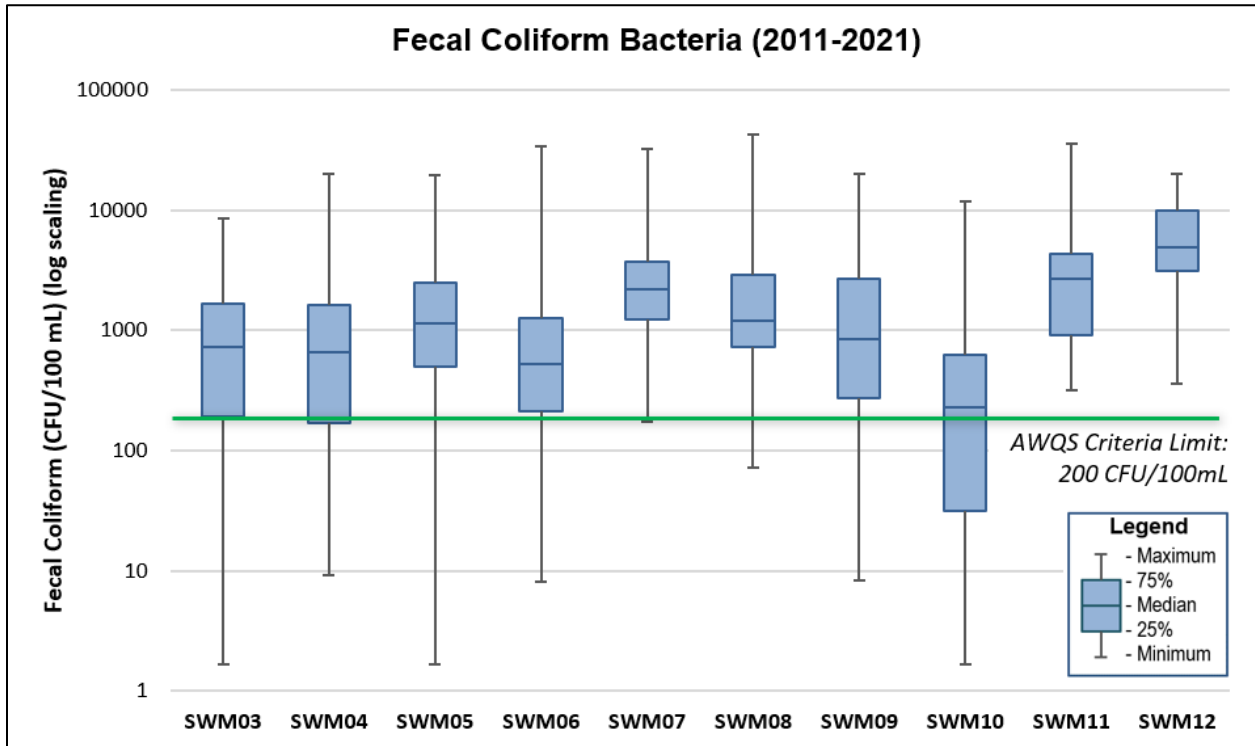


Figure 24. Station Box Plot of BOD₅ by Outfall, All Data 2011 through 2021



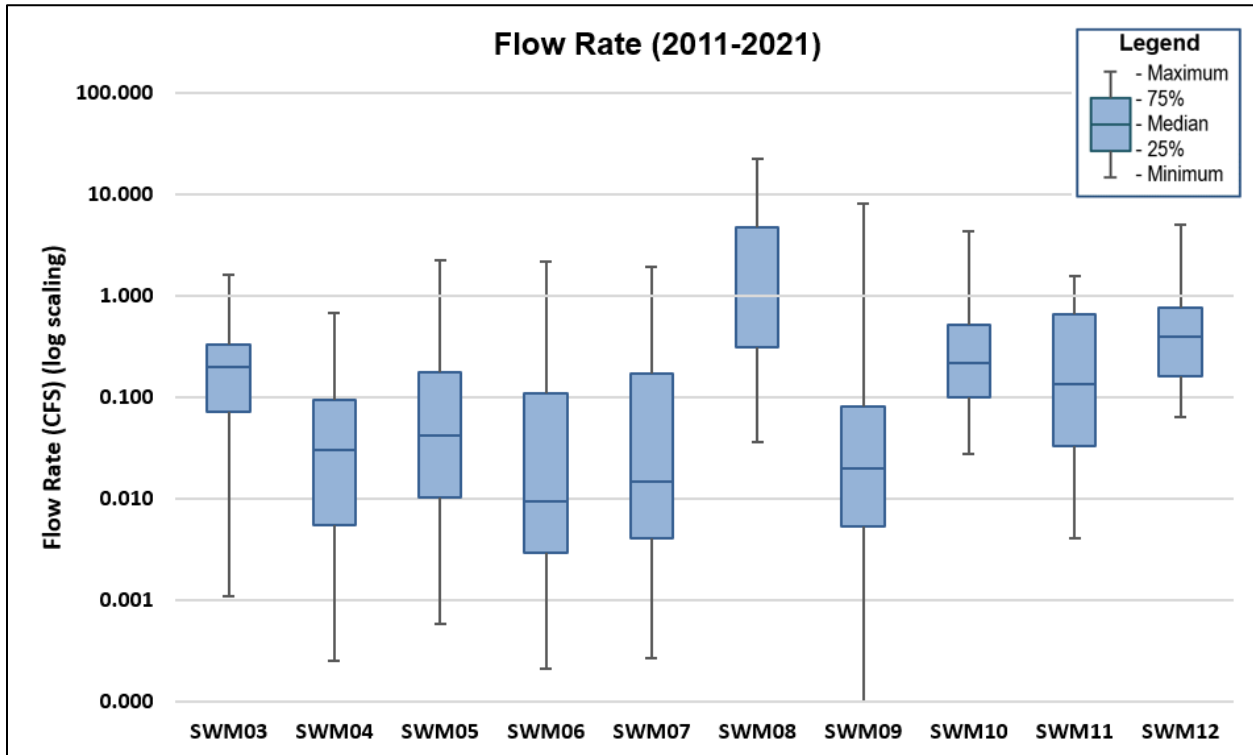
SWM07 and SWM12 have the highest BOD₅ concentration seen throughout the data record (Figure 24), 6.15 mg/L and 6.49 mg/L respectively. Historic mean BOD₅ concentrations at SWM07 and SWM12 are statistically indistinguishable (P value 0.54). Both outfalls drain commercial/industrial land use areas that include a high percentage of streets, parking lots, and other impervious surfaces. The elevated BOD₅ concentrations at these outfalls may be a result of vehicle cooling liquid inputs (glycols) from streets and driveways. In contrast, SWM10 is one of the locations with the lowest BOD₅ concentrations.

Figure 25. Station Box Plot of Fecal Coliform Bacteria by Outfall, All Data 2011 through 2021



The box plot data record for fecal coliform is presented in Figure 25. Outfall sites SWM07, SWM11, and SWM12 have the highest median fecal coliform concentrations of the ten monitoring sites, with median concentrations of 2,200, 2,700 and 4,900 CFU/100mL respectively. The data record for SWM11 and SWM12 is only five years long, as opposed to eleven years for the other outfalls, and further sampling will be required to monitor the trends at these outfalls. With five years of data, SWM12 is emerging as the site presenting the highest fecal coliform concentrations with statistically significant ($P=0.018$) higher average and median concentrations than SWM07. The sources of the higher concentrations seen at SWM07, SWM11, and SWM12 are unknown, but it is likely that the factors contributing to elevated fecal coliform measurements differ at each site. Other locations with elevated fecal coliform concentrations include SWM05 and SWM08 which have median concentrations over 1,000 CFU/100mL. SWM10 consistently has the lowest fecal coliform concentrations with a median concentration of 230 CFU/100mL.

Figure 26. Station Box Plot of Flow Rate by Outfall, All Data 2011 through 2021



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

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



Figure 27. Station Box Plot of Hardness by Outfall, All Data 2016 through 2021

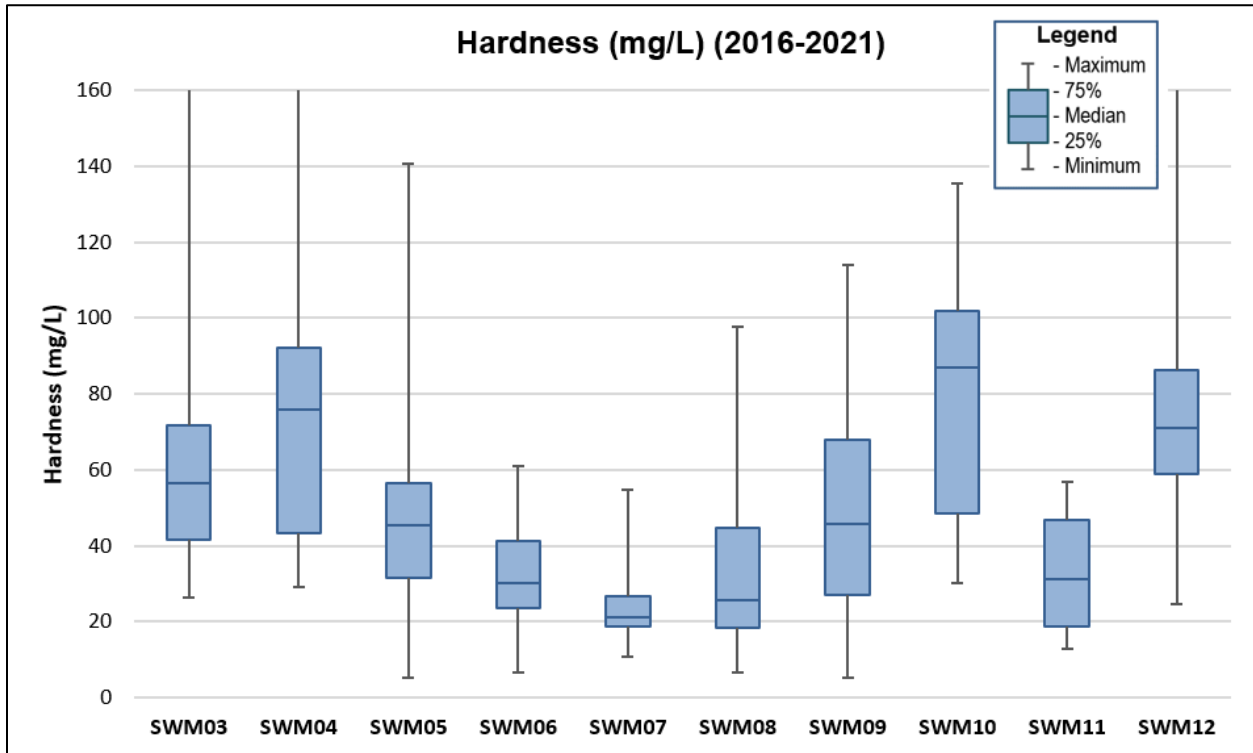
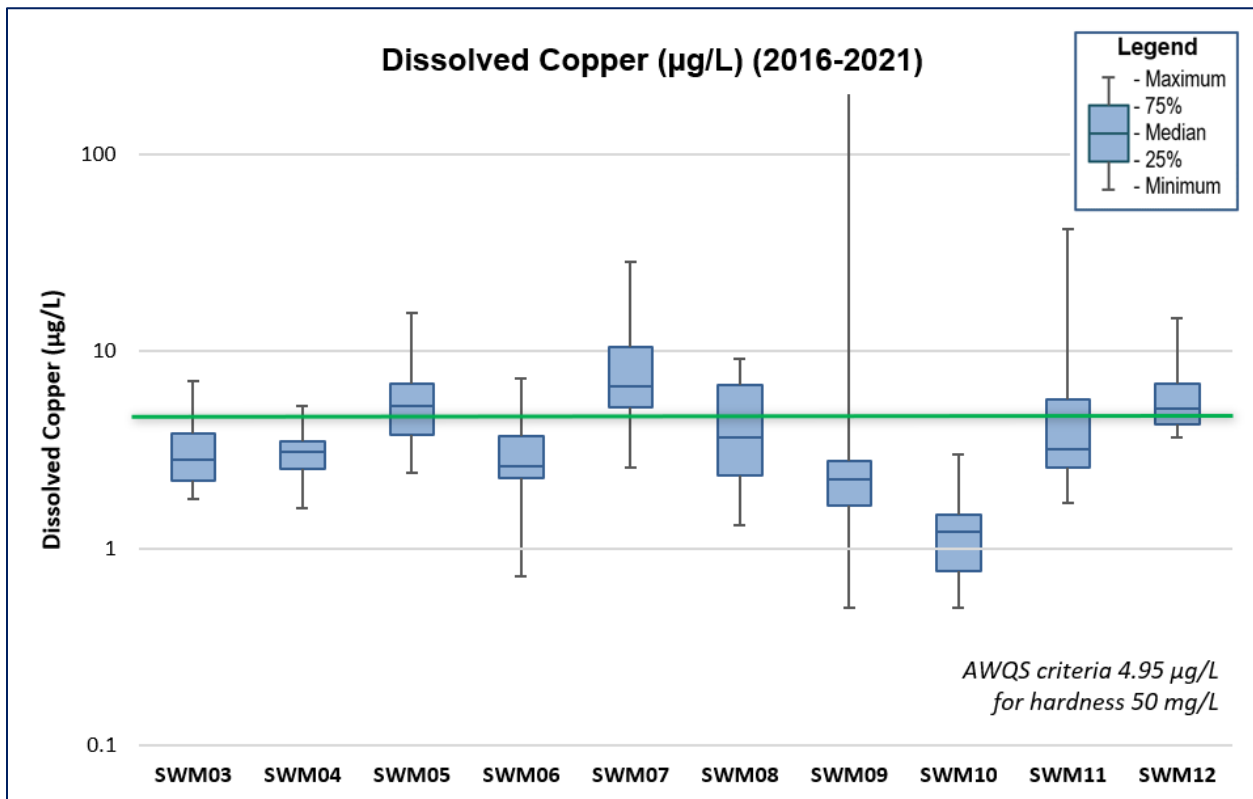


Figure 28. Station Box Plot of Dissolved Copper by Outfall, All Data 2016 through 2021



3.7 Seasonal and Yearly Trends

The SWM Program data record was examined for seasonal and yearly trends. The timing of outfall monitoring varies year-to-year depending on weather conditions and the timing of suitable storm events, and parameters can vary with season. Typically, sampling for the SWM Program begins in July and continues through September. The 2021 SWM Program first sampled on August 27 and concluded on October 8, falling slightly later than the typical window for sampling based on prior monitoring years. During the latter two storm events, the temperature was cold enough that precipitation turned to sleet and snow. Due to the timing of this year's SWM Program, seasonal impacts may have a greater influence on the data.

Figure 29 presents the seasonal patterns for key parameters for the data record from 2011 through 2021, plotted against the day of the year. As expected, temperature fluctuates with season and was highest across all locations in July and August. DO fluctuates inversely to temperature, with the lowest DO concentrations occurring during the summer months when temperatures are highest and increasing DO concentrations in the fall as water temperatures cool. Fecal coliform concentrations are not as highly correlated with season as are temperature and DO. It appears that fecal coliform concentrations may decrease in the fall months, though more data is needed to support this conclusion. Seasonal pattern regression values are presented on each plot where the data have been fitted to a third-order polynomial.

There are significant year-to-year fluctuations for various parameters tested, but there do not appear to be any significant broader trends evident in the data. For example, fecal coliform concentrations vary each monitoring year, with spikes in the data occurring seemingly at random at many of the outfalls throughout the data record. For example, there are spikes in the data (greater than 10,000 CFU/100mL) at two of the outfalls in 2016, six outfalls in 2017, five outfalls in 2018, zero outfalls in 2019, one outfall in 2020, and two outfalls in 2021. There is significant variability year to year in fecal coliform concentrations that can only partially be explained by seasonal patterns and does not appear to fit any long-term trends. Overall, fecal coliform levels in 2021 were lower than those observed in 2017 and 2018 but slightly elevated from those observed in 2019 and 2020.

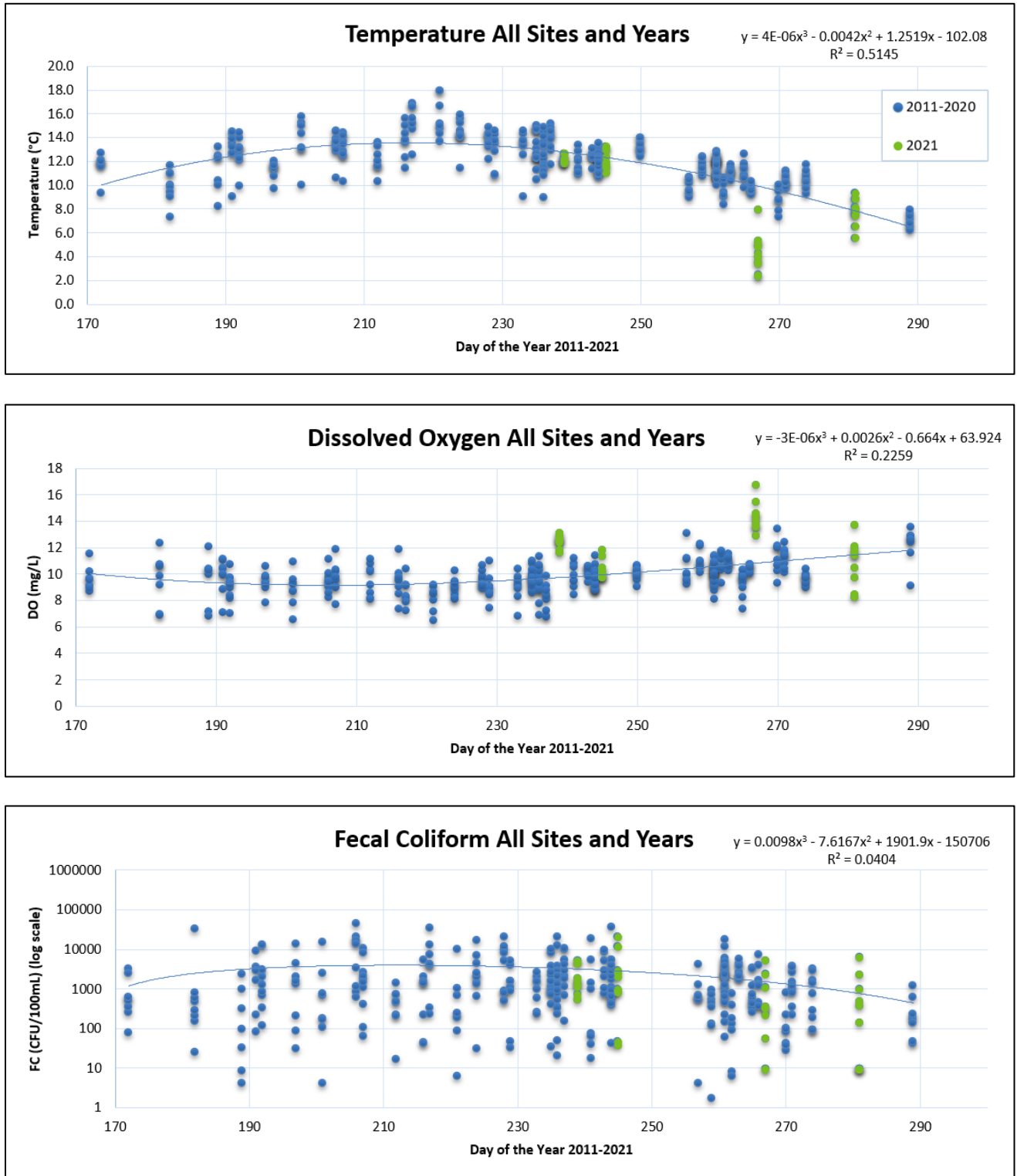


Figure 29. Seasonal Patterns for Temperature, DO, and Fecal Coliform, All Sites and All Years

3.8 Annual Loading

Annual loadings for fecal coliform and hydrocarbons are presented in Figure 30 and Figure 31. These annual loadings are calculated using the Simple Method, which was developed under an EPA grant to provide Phase II communities with tools to protect their local watersheds (SMRC 2010). The Simple Method estimates stormwater runoff pollutant loads for urban areas based on the following parameters: subbasin drainage area and percent impervious cover, flow-weighted or event-mean stormwater runoff pollutant concentrations, and annual precipitation. Calculations are based on specific land uses (e.g., residential, commercial, industrial, roadways) to calculate annual pollutant loads for each land use type. The method can also be used for pollutant comparisons by more general land uses such as new suburban areas, older urban areas, central business districts, and highways. Equations and calculation methodology utilized for the Simple Method are detailed in Attachment B of the QAP (MOA 2020).

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

Annual loading estimates were developed for both fecal coliform and hydrocarbons. Fecal coliform loading calculations (Figure 30) utilized the annual geometric mean for each location to account for the high variability in fecal coliform counts. For hydrocarbons, both TPAH and TAH (as BTEX) were examined. The 2021 monitoring SWM Program includes TAH in the hydrocarbon loading analysis (TAH was first included in the 2019 analysis). Hydrocarbon loading calculations (Figure 31) utilize the annual arithmetic mean for each location.

Figure 30. Fecal Coliform Annual Loading by Monitoring Site

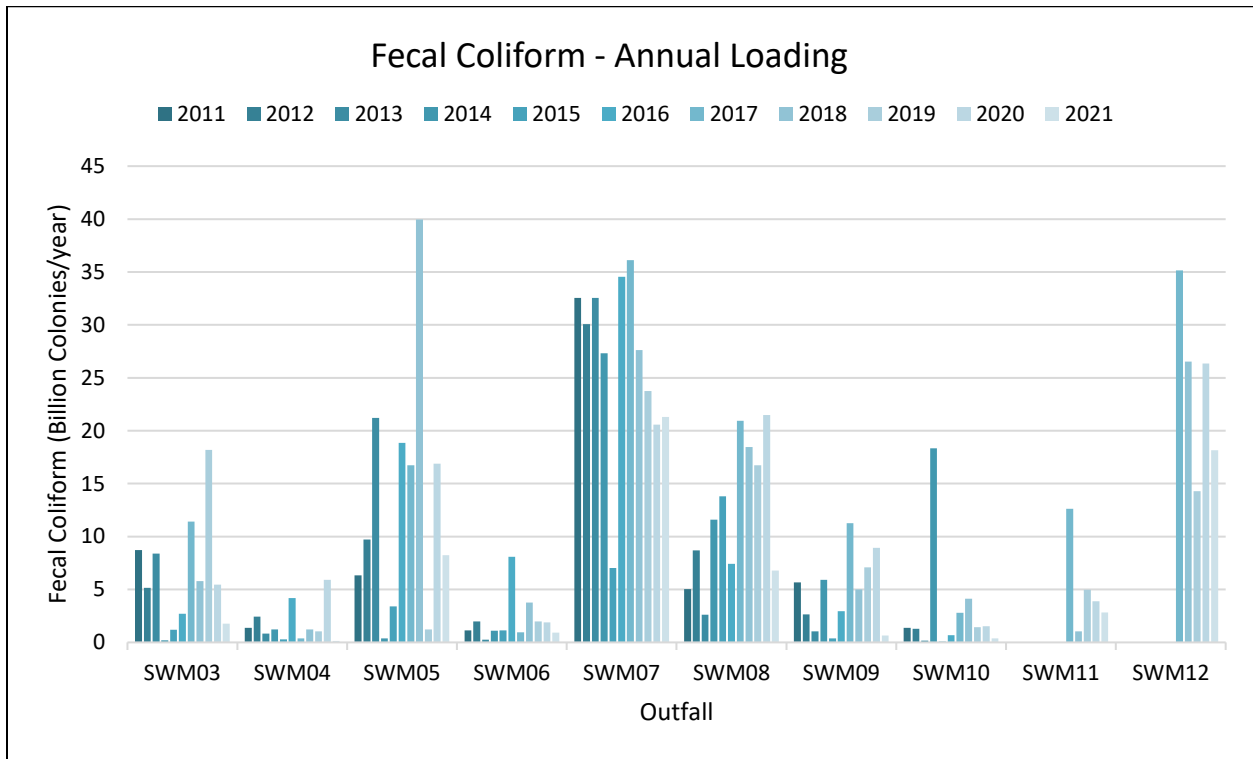
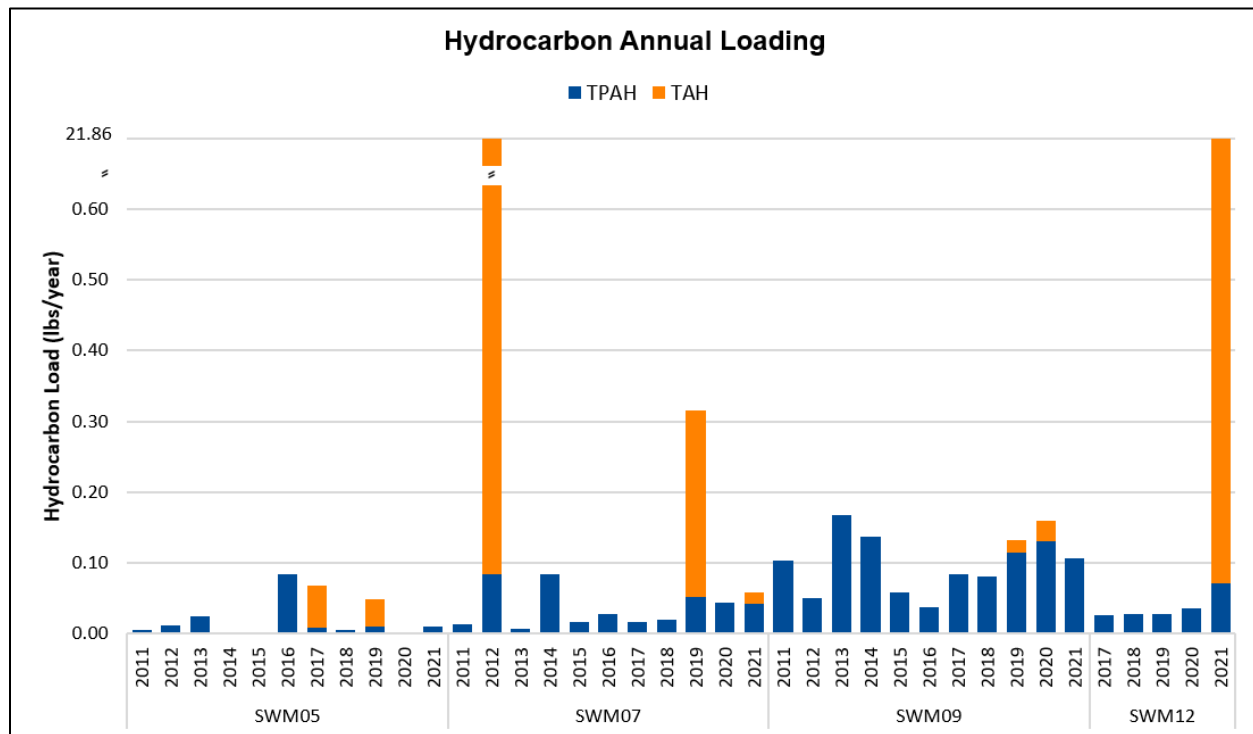


Figure 31. Hydrocarbon Annual Loading by Monitoring Site



Note that the y-axis is non-linear.

In 2020, the fecal coliform loading at SWM07 had seen a five-year downward trend, bringing it from the outfall with the highest annual fecal coliform loading to having a lower load estimate than SWM08 and SWM12. With the addition of the 2021 data, SWM07's downward trend seems to have plateaued and once again it has the highest annual fecal coliform loading with an estimate of 21.3 billion colonies/year. SWM07 represents a commercial/industrial land use area. For the other outfalls, SWM12 has the second largest annual fecal coliform loading, SWM05 has the third, and SWM08 has the fourth. The lowest fecal loading estimates were at SWM04, SWM06, SWM09, and SWM10, all with estimates under 1.0 billion colonies/year. Fecal coliform counts and subsequent annual loading estimates still seem to be highly variable and further sampling will be required to identify trends at these outfalls.

As determined by TAH and TPAH measurements, annual hydrocarbon loading estimates for 2021 were up at all measured outfalls: SWM05, SWM07, SWM09, and SWM12. Notably, SWM12 had TAH detections for the first time in the data record and during every single 2021 storm event.

In 2021, there was a general increase in TAH and TPAH detections as compared to the 2020 monitoring year. This year, 5 of the 16 samples (SWM07 and SWM12) detected TAH constituents compared to 4 samples (SWM09) in 2020. 15 of the 16 samples (all outfalls) detected TPAH constituents compared to 10 samples (SWM07, SWM09, and SWM12) in 2020.

Prior to 2019, TAH constituents had only been detected in two samples in the SWM Program data record, once in 2012 at SWM07 (with an exceptionally high concentration) and once in 2017 at SWM05. The 2019 monitoring report surmised that the sudden increase in TAH detections in 2019 were related to the historic drought that occurred that summer. The 2020 monitoring report surmised that increased weekday traffic at the Sullivan Arena may have affected the increase in TAH detections at SWM09. Another thing to note is that since March 2020, how people travel and interact has greatly been impacted by the COVID-19 pandemic. The 2021 data does not support the claim that increased TAH detection is directly correlated to the shelter at the Sullivan Arena, since the shelter was still active through 2021 but TAH was not detected at SWM09 during 2021. Continued monitoring will be required to determine if the increase in TAH detections is part of a broader trend.

4.0 Summary and Conclusions

This report details the findings of the 2021 Municipality of Anchorage (MOA) stormwater monitoring program (SWM Program), satisfying the requirements of the current municipal MS4 permit (Permit No. AKS-052558). The Anchorage MS4 permit establishes control measures and requires the development of programs designed to prevent contaminants from entering the storm sewer system. The permit further identifies monitoring objectives, including stormwater outfall monitoring (Section 4.1.7 of the MS4 permit). The stormwater outfall monitoring program monitors 10 priority outfall locations that represent a variety of major land use areas within the Anchorage Bowl. The SWM Program tests these outfall locations at least four times each year during storm events for specific physical and chemical parameters. The stormwater sampling conducted during 2021 represents the eleventh year of outfall monitoring under the current SWM Program.

The 2021 SWM Program successfully sampled four storm events at the 10 priority outfall locations included in the monitoring program. This year's sampling events occurred on August 27, September 2, September 24, and October 8, 2021.

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

Fecal coliform levels measured in the 2021 SWM Program fell within historical ranges for the program and were generally lower than those measured in 2017 and 2018. Fecal coliform levels were slightly elevated relative to 2019 and 2020. With the addition of the 2021 data, SWM07's 5-year downward trend seems to have plateaued, and it now has the highest annual fecal coliform loading with an estimate of 21.3 billion colonies/year. In contrast, SWM04 had the lowest calculated annual fecal coliform loading estimate in the analysis.

Annual hydrocarbon loading estimates for the 2021 SWM Program were increased at all the outfalls sampled for hydrocarbons relative to the 2020 monitoring year. For the first time in the data record, SWM12 had TAH detections. Most hydrocarbon measurements fell within historical ranges (except SWM12 during Storm 4) and all fell below AWQS criteria. Hydrocarbon loading estimates were increased for all outfalls for both TPAH and TAH detection in each of the four storms included in the SWM Program. There were no patterns in the data that present cause for concern or fall outside of historical norms. Continued monitoring will be required to determine if the increased hydrocarbon detections is part of a broader trend.

5.0 References

- ACCAP 2019. Alaska Center for Climate Assessment and Policy, University of Alaska Fairbanks. Accessed at <https://uaf-accap.org/> on December 16, 2019.
- ADEC 2004a. Total Maximum Daily Loads (TMDLs) for Fecal Coliform in the Waters of Little Campbell Creek in Anchorage, Alaska. Final - March 2004.
- ADEC 2004b. Total Maximum Daily Loads (TMDLs) for Fecal Coliform in the Waters of Furrow Creek in Anchorage, Alaska. Final - March 2004.
- ADEC 2005. Total Maximum Daily Loads (TMDLs) for Fecal Coliform in Chester Creek, University Lake, and Westchester Lagoon, Anchorage, Alaska. Final - May 2005.
- ADEC 2006. Total Maximum Daily Loads (TMDLs) for Fecal Coliform Bacteria in the Waters of Campbell Creek and Campbell Lake in Anchorage, Alaska. Final - May 2006.
- ADEC 2008. Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances. State of Alaska Department of Environmental Conservation.
- ADEC 2009. Water Quality Standards, 18 AAC 70. State of Alaska Department of Environmental Conservation.
- ADEC 2015a. Authorization to Discharge under the Alaska Pollutant Discharge Elimination System, Permit No. Anchorage Municipal Separate Storm Sewer System, Individual Permit AKS052558. Permit Issued to the Municipality of Anchorage and the Alaska Department of Transportation and Public Facilities. June 26, 2015.
- ADEC 2015b. Fact Sheet for APDES Permit No. AKS-052558. May 5, 2015.
- ADEC 2018. State of Alaska 2014/2016 Final Integrated Water Quality Monitoring and Assessment Report. November 2, 2018.
- AWC 2014. Chester Creek Watershed Plan, Draft. Prepared for the Municipal Planning Department and Watershed Management Services. Prepared by Anchorage Waterways Council.
- EPA 1983. Results of the Nationwide Urban Runoff Program. Water Planning Division, PB 84-185552, Washington, D.C., December 1983.
- EPA 2009. Authorization to Discharge under the National Pollutant Discharge Elimination System, Permit No. AKS-052558. Permit Issued to the Municipality of Anchorage and the Alaska Department of Transportation and Public Facilities. October 29, 2009.
- MOA 2003. Fecal Coliform in Anchorage Streams: Sources and Transport Processes. Document APg03001. September 2003.

- MOA 2020. Monitoring, Evaluation, and Quality Assurance Plan, APDES Permit No. AKS052558. Prepared for Alaska Department of Environmental Conservation, Division of Water. Prepared by HDR Alaska, Inc. and Municipality of Anchorage. 2020.
- NADP 2018. National Atmospheric Deposition Program 2017 Annual Summary. Wisconsin State Laboratory of Hygiene, University of Wisconsin-Madison, WI. 2017.
- NOAA 2020. National Oceanic and Atmospheric Administration. Monthly Precipitation Normals for Ted Stevens Anchorage International Airport, 1991-2020. Accessed at <https://www.ncei.noaa.gov/products/land-based-station/us-climate-normals/> on October 27, 2021.
- NOAA 2021. National Oceanic and Atmospheric Administration National Centers for Environmental Information. Accessed at <https://www.ncdc.noaa.gov/cdo-web/> on October 27, 2021.
- NWS 2021a. National Weather Service, Weather Conditions For: KTUA2 Anchorage Midtown, AK. Accessed at <https://www.wrh.noaa.gov/mesowest/timeseries.php?wfo=arh&num=24&sid=KTUA2>.
- NWS 2021b. National Weather Service Forecast office, Anchorage, AK. Monthly Weather Summary. Anchorage. Data downloaded from <https://www.weather.gov/wrh/Climate?wfo=afc> on December 1, 2021.
- 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.



This page intentionally left blank.



Appendix A

Outfall Site Maps



This page intentionally left blank.



Appendix B

Photographs



This page intentionally left blank.



Appendix C

Laboratory Data Packages and Chain of Custodies



This page intentionally left blank.



Appendix D

Field and Laboratory Data Validation



This page intentionally left blank.



Appendix E

Field Logs



This page intentionally left blank.

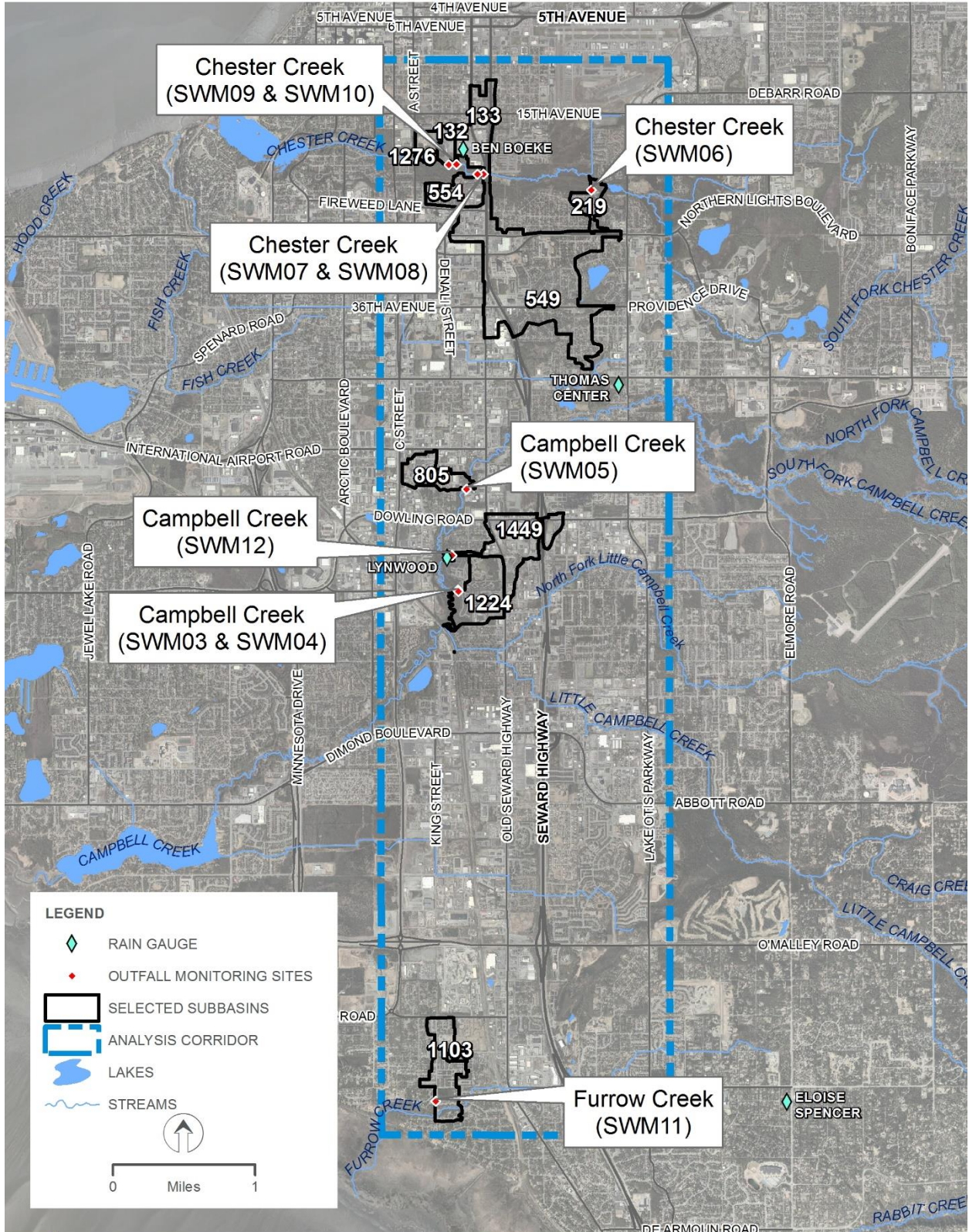


Appendix A

Outfall Site Maps



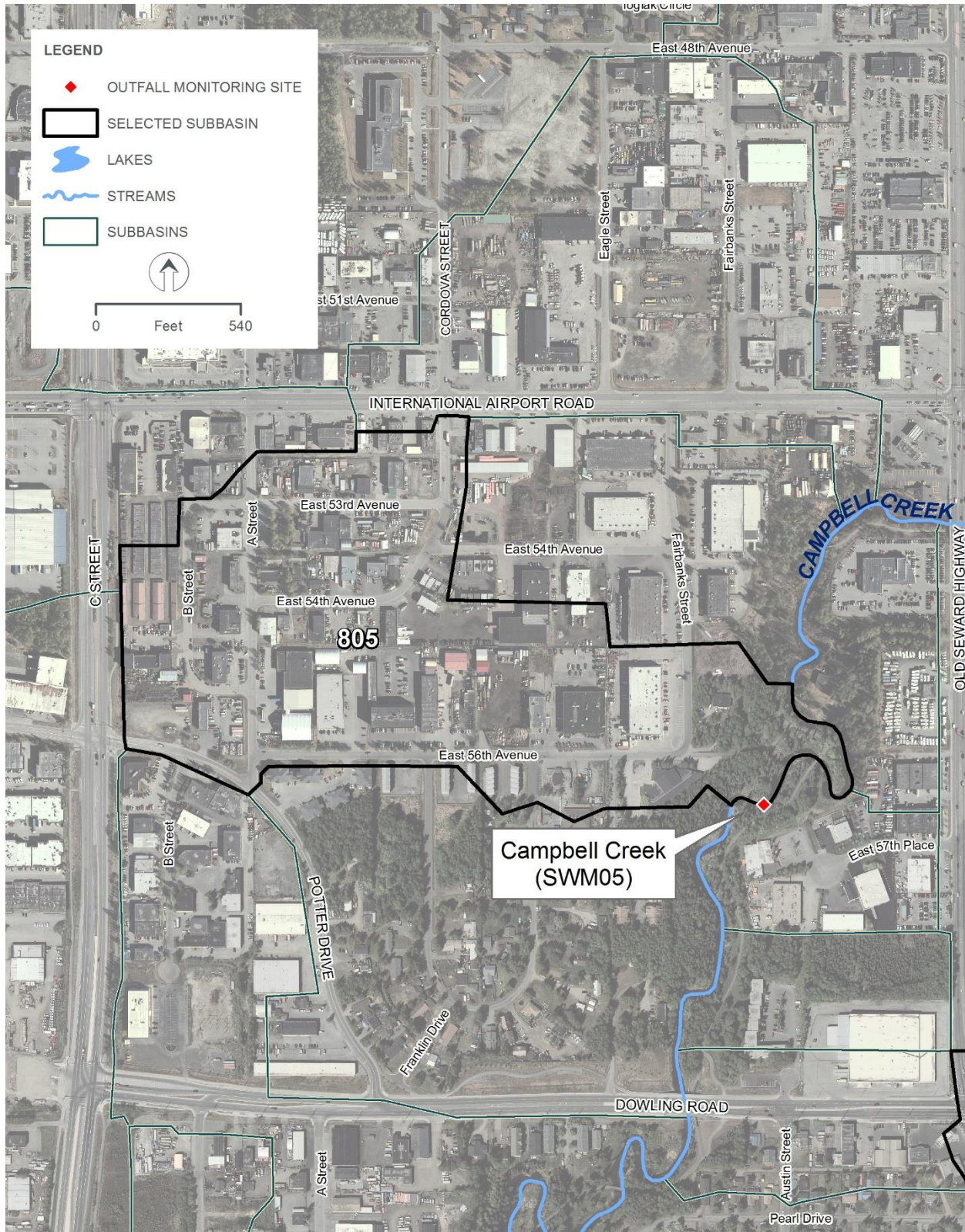
This page intentionally left blank.



**MOA STORMWATER OUTFALL MONITORING
TEN PRIORITY OUTFALL MONITORING SITES**

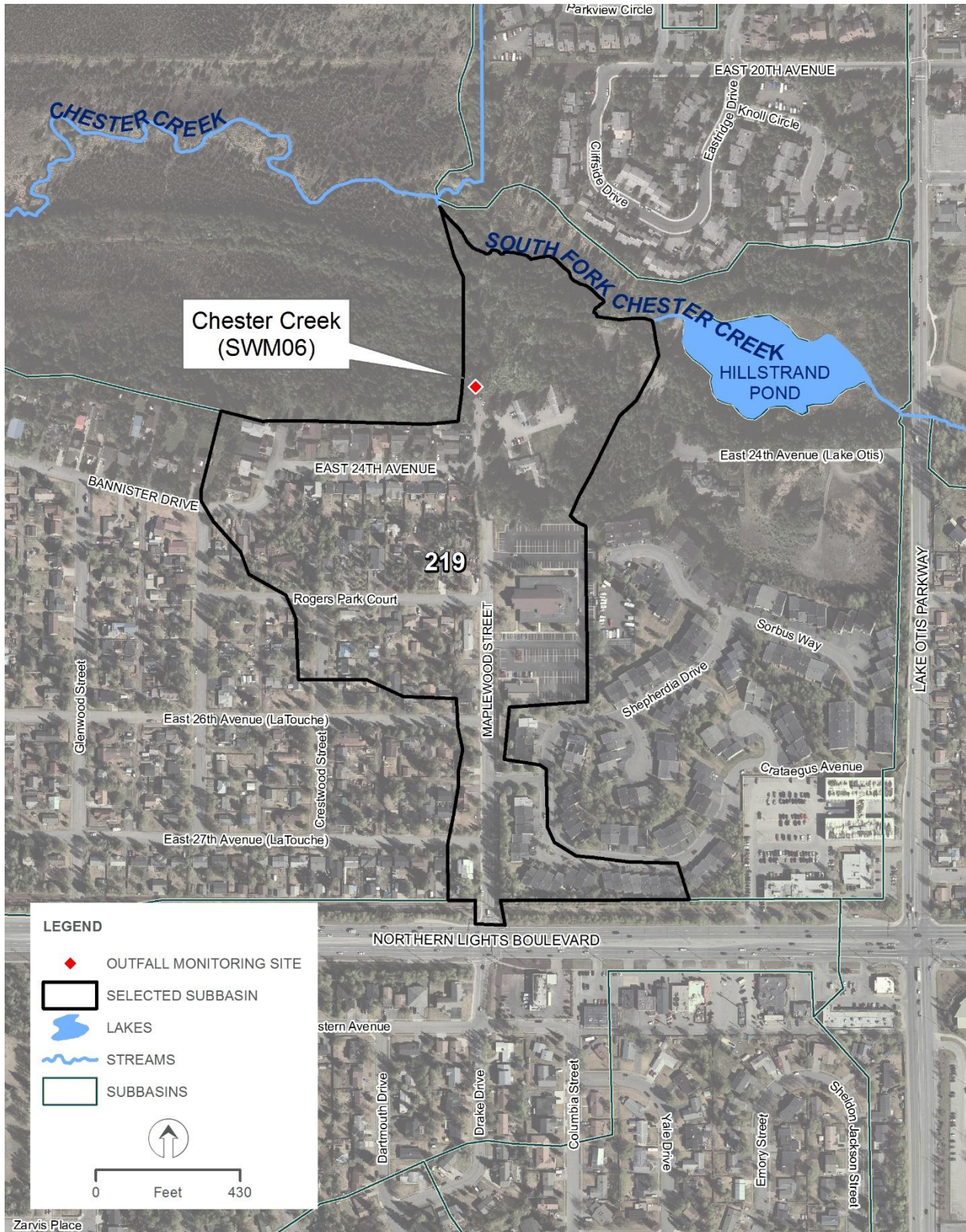
FIGURE 1





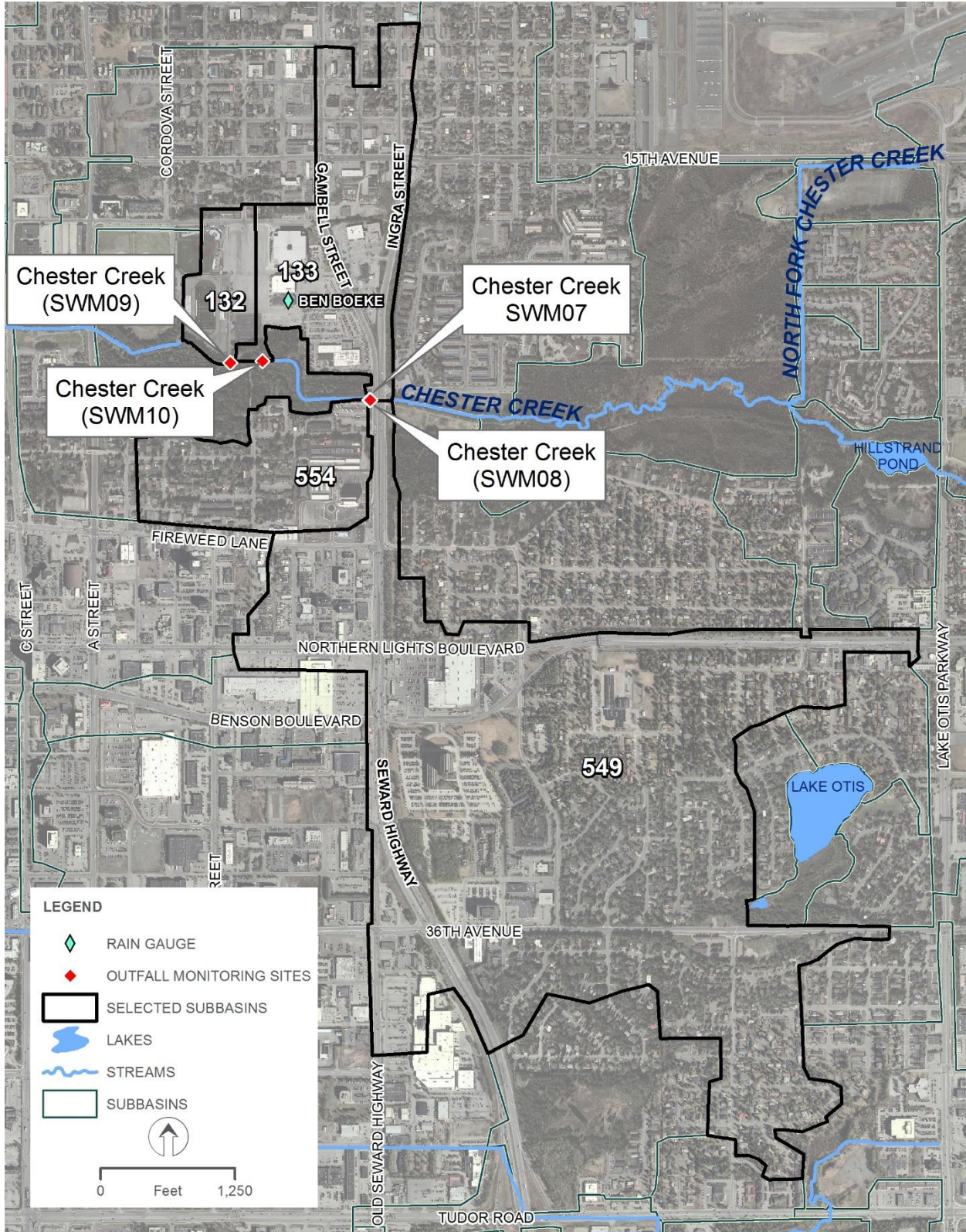
**MOA STORMWATER OUTFALL MONITORING
SAMPLING STATION SWM05, UPDATED SUBBASIN 805**

FIGURE 2



**MOA STORMWATER OUTFALL MONITORING
SAMPLING STATION SWM06, UPDATED SUBBASIN 219**

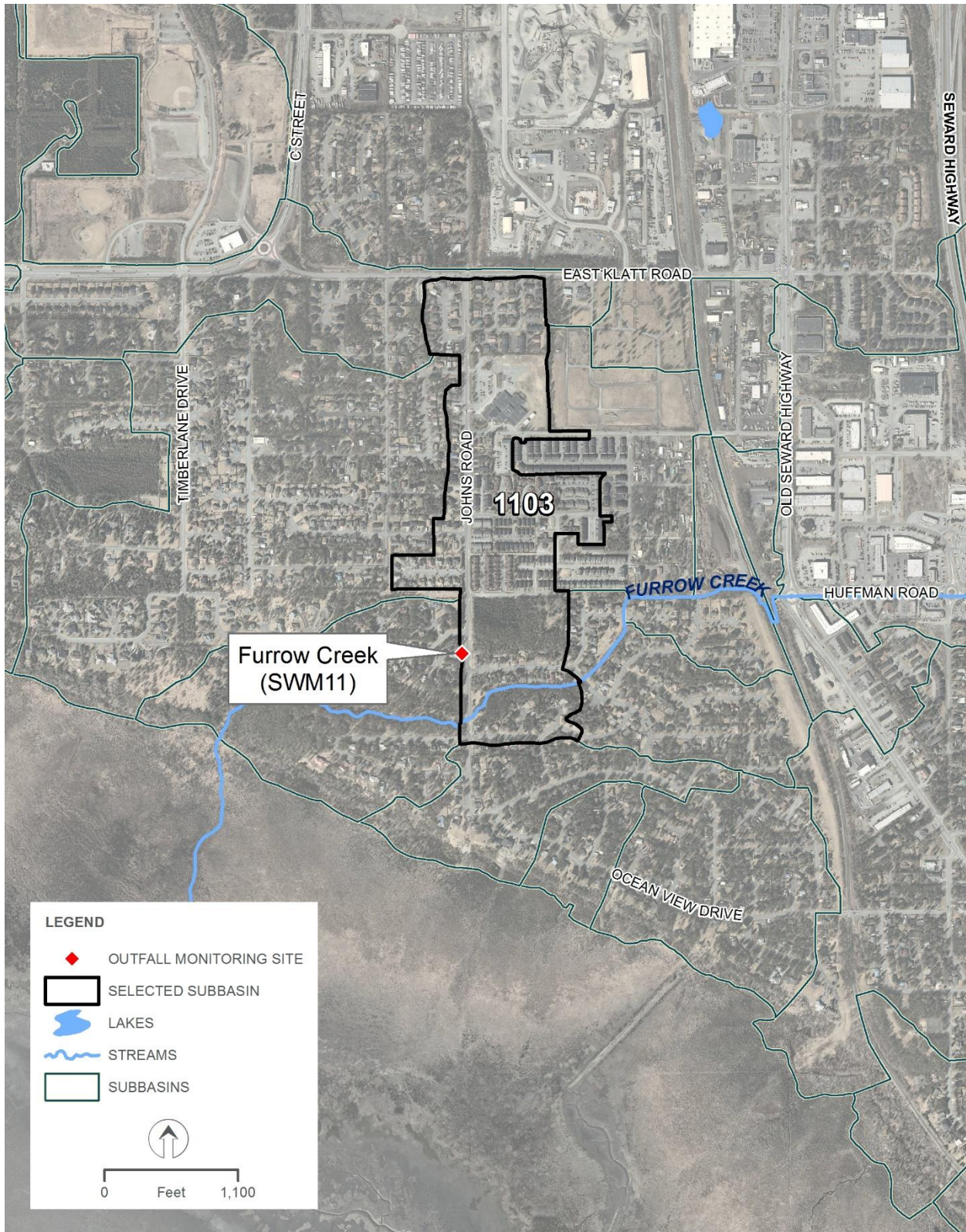
FIGURE 3



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

FIGURE 4





MOA STORMWATER OUTFALL MONITORING
SAMPLING STATION SWM11, UPDATED SUBBASIN 1103

FIGURE 5



**MOA STORMWATER OUTFALL MONITORING
SAMPLING STATIONS SWM03, SWM04, AND SWM12,
UPDATED SUBBASINS 1224 AND 1449**

FIGURE 6



Appendix B

Photographs



This page intentionally left blank.



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



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



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



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



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



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



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



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



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



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



Appendix C

Laboratory Data Packages and Chain of Custodies



This page intentionally left blank.



Appendix C1
Laboratory Data Package
Storm Event #1



This page intentionally left blank.



281 N Main St., STE # 101
Wasilla AK, 99654
907-373-6130

Alaska Laboratory# AK01000

Client HDR Inc
Contact Cindy Helmericks

Project Name MOA Stormwater Monitoring
AWL # AWL-21-01541
PWS # None

Please direct any questions regarding the final report to Mary@AKWaterLabs.com or Matt@AKWaterLabs.com, or call 907-373-6130.

The results presented in this report meet the requirement of the laboratory's certifications and internal QC processes. Any exceptions will be noted in the case narratives attached. Reports with subcontracted laboratory data will be attached in full, with their quality control recoveries and case narrations.

The attached should contain analytical results for the analyses submitted on the client chain of custody. The information includes no opinions of the analysts or labs, data is represented after meeting certified testing requirements, and quality control measures.

Reproduction of the report in full requires the written approval of the laboratory.

Signature of Laboratory Management Date

Alaska Laboratory# AK01000

Client Project Name MOA Stormwater Monitoring AWL # AWL-21-01541

Receipt Date and Time 8/27/21 14:02 Due Date 9/20/2021

Cooler/Sample Temp (C) Red 5.73C, Blue 3.63C Sampler Initials KC

Sample Receipt Comments Samples received by MJG on 8/27/2021 at 5.73C (Red), 3.63C (Blue), on frozen ice. [Samples AWL-21-01541-001 through AWL-21-01541-007 received in red. Samples AWL-21-01541-008 through AWL-21-01541-014 received in blue.]

Samples Received

Microbiological

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-01	AWL-21-01541-001	8/27/2021 9:50	8/27/21 15:00	Fecal Coliform	
SWM 04-01	AWL-21-01541-002	8/27/2021 9:55	8/27/21 15:00	Fecal Coliform	
SWM 05-01	AWL-21-01541-003	8/27/2021 10:30	8/27/21 15:00	Fecal Coliform	
SWM 06-01	AWL-21-01541-004	8/27/2021 8:55	8/27/21 15:00	Fecal Coliform	
SWM 07-01	AWL-21-01541-005	8/27/2021 7:30	8/27/21 15:00	Fecal Coliform	
SWM 08-01	AWL-21-01541-006	8/27/2021 7:45	8/27/21 15:00	Fecal Coliform	
SWM 08-01 DUP	AWL-21-01541-007	8/27/2021 7:50	8/27/21 15:31	Fecal Coliform	
SWM 09-01	AWL-21-01541-008	8/27/2021 8:15	8/27/21 15:31	Fecal Coliform	
SWM 10-01	AWL-21-01541-009	8/27/2021 8:30	8/27/21 15:31	Fecal Coliform	
SWM 11-01	AWL-21-01541-010	8/27/2021 9:25	8/27/21 15:31	Fecal Coliform	
SWM 12-01	AWL-21-01541-011	8/27/2021 11:30	8/27/21 15:31	Fecal Coliform	
SWM 12-01 DUP	AWL-21-01541-012	8/27/2021 11:35	8/27/21 15:31	Fecal Coliform	
SWM 12-01	AWL-21-01541-013	8/27/2021 11:40	8/27/21 15:31	Fecal Coliform	

Chemical

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-01	AWL-21-01541-001	8/27/2021 9:50	8/27/21 17:06	BOD	
SWM 03-01	AWL-21-01541-001	8/27/2021 9:50	9/3/21 16:22	TSS	
SWM 03-01	AWL-21-01541-001	8/27/2021 9:50	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 04-01	AWL-21-01541-002	8/27/2021 9:55	8/27/21 17:06	BOD	
SWM 04-01	AWL-21-01541-002	8/27/2021 9:55	9/3/21 16:22	TSS	
SWM 04-01	AWL-21-01541-002	8/27/2021 9:55	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 05-01	AWL-21-01541-003	8/27/2021 10:30	8/27/21 17:06	BOD	
SWM 05-01	AWL-21-01541-003	8/27/2021 10:30	9/1/21 12:45	TSS	
SWM 05-01	AWL-21-01541-003	8/27/2021 10:30	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 06-01	AWL-21-01541-004	8/27/2021 8:55	8/27/21 17:06	BOD	
SWM 06-01	AWL-21-01541-004	8/27/2021 8:55	9/1/21 12:45	TSS	
SWM 06-01	AWL-21-01541-004	8/27/2021 8:55	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 07-01	AWL-21-01541-005	8/27/2021 7:30	8/27/21 17:06	BOD	
SWM 07-01	AWL-21-01541-005	8/27/2021 7:30	9/1/21 12:45	TSS	
SWM 07-01	AWL-21-01541-005	8/27/2021 7:30	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 08-01	AWL-21-01541-006	8/27/2021 7:45	8/27/21 17:06	BOD	
SWM 08-01	AWL-21-01541-006	8/27/2021 7:45	9/1/21 12:45	TSS	
SWM 08-01	AWL-21-01541-006	8/27/2021 7:45	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 08-01 DUP	AWL-21-01541-007	8/27/2021 7:50	8/27/21 17:06	BOD	
SWM 08-01 DUP	AWL-21-01541-007	8/27/2021 7:50	9/1/21 12:45	TSS	
SWM 08-01 DUP	AWL-21-01541-007	8/27/2021 7:50	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 09-01	AWL-21-01541-008	8/27/2021 8:15	8/27/21 17:06	BOD	
SWM 09-01	AWL-21-01541-008	8/27/2021 8:15	9/1/21 12:45	TSS	
SWM 09-01	AWL-21-01541-008	8/27/2021 8:15	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 10-01	AWL-21-01541-009	8/27/2021 8:30	8/27/21 17:06	BOD	

SWM 10-01	AWL-21-01541-009	8/27/2021 8:30	9/1/21 12:45	TSS	
SWM 10-01	AWL-21-01541-009	8/27/2021 8:30	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 11-01	AWL-21-01541-010	8/27/2021 9:25	8/27/21 17:06	BOD	
SWM 11-01	AWL-21-01541-010	8/27/2021 9:25	9/1/21 12:45	TSS	
SWM 11-01	AWL-21-01541-010	8/27/2021 9:25	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 12-01	AWL-21-01541-011	8/27/2021 11:30	8/27/21 17:06	BOD	
SWM 12-01	AWL-21-01541-011	8/27/2021 11:30	9/1/21 12:45	TSS	
SWM 12-01	AWL-21-01541-011	8/27/2021 11:30	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 12-01 DUP	AWL-21-01541-012	8/27/2021 11:35	8/27/21 17:06	BOD	
SWM 12-01 DUP	AWL-21-01541-012	8/27/2021 11:35	9/1/21 12:45	TSS	
SWM 12-01 DUP	AWL-21-01541-012	8/27/2021 11:35	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 12-01	AWL-21-01541-013	8/27/2021 11:40	8/27/21 17:06	BOD	
SWM 12-01	AWL-21-01541-013	8/27/2021 11:40	9/1/21 12:45	TSS	
SWM 12-01	AWL-21-01541-013	8/27/2021 11:40		Hardness	MS/MSD Volume - can't use as sample since samples are parent target samples - Reported in QC

Subcontracted

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-01	AWL-21-01541-001	8/27/2021 9:50	9/30/21 17:28	200.8 DISS	K2110626-013
SWM 03-01	AWL-21-01541-001	8/27/2021 9:50	10/4/21 13:28	200.7	K2110626-001
SWM 04-01	AWL-21-01541-002	8/27/2021 9:55	9/30/21 17:36	200.8 DISS	K2110626-014
SWM 04-01	AWL-21-01541-002	8/27/2021 9:55	10/4/21 13:36	200.7	K2110626-002
SWM 05-01	AWL-21-01541-003	8/27/2021 10:30	9/9/21 15:41	624	1215582001
SWM 05-01	AWL-21-01541-003	8/27/2021 10:30	9/10/21 18:03	625 SIM	1215582001
SWM 05-01	AWL-21-01541-003	8/27/2021 10:30	9/30/21 17:43	200.8 DISS	K2110626-015
SWM 05-01	AWL-21-01541-003	8/27/2021 10:30	10/4/21 13:39	200.7	K2110626-003
SWM 06-01	AWL-21-01541-004	8/27/2021 8:55	9/30/21 17:45	200.8 DISS	K2110626-016
SWM 06-01	AWL-21-01541-004	8/27/2021 8:55	10/4/21 13:41	200.7	K2110626-004
SWM 07-01	AWL-21-01541-005	8/27/2021 7:30	9/9/21 15:56	624	1215582002
SWM 07-01	AWL-21-01541-005	8/27/2021 7:30	9/10/21 18:24	625 SIM	1215582002
SWM 07-01	AWL-21-01541-005	8/27/2021 7:30	9/30/21 17:48	200.8 DISS	K2110626-017
SWM 07-01	AWL-21-01541-005	8/27/2021 7:30	10/4/21 13:44	200.7	K2110626-005
SWM 08-01	AWL-21-01541-006	8/27/2021 7:45	9/30/21 17:50	200.8 DISS	K2110626-018
SWM 08-01	AWL-21-01541-006	8/27/2021 7:45	10/4/21 13:47	200.7	K2110626-006
SWM 08-01 DUP	AWL-21-01541-007	8/27/2021 7:50	9/30/21 17:53	200.8 DISS	K2110626-019
SWM 08-01 DUP	AWL-21-01541-007	8/27/2021 7:50	10/4/21 13:49	200.7	K2110626-007
SWM 09-01	AWL-21-01541-008	8/27/2021 8:15	9/9/21 16:11	624	1215582003
SWM 09-01	AWL-21-01541-008	8/27/2021 8:15	9/10/21 18:44	625 SIM	1215582003
SWM 09-01	AWL-21-01541-008	8/27/2021 8:15	9/30/21 17:55	200.8 DISS	K2110626-020
SWM 09-01	AWL-21-01541-008	8/27/2021 8:15	10/4/21 13:52	200.7	K2110626-008
SWM 10-01	AWL-21-01541-009	8/27/2021 8:30	9/30/21 17:57	200.8 DISS	K2110626-021
SWM 10-01	AWL-21-01541-009	8/27/2021 8:30	10/4/21 14:06	200.7	K2110626-009

SWM 11-01	AWL-21-01541-010	8/27/2021 9:25	9/30/21 18:00	200.8 DISS	K2110626-022
SWM 11-01	AWL-21-01541-010	8/27/2021 9:25	10/4/21 14:09	200.7	K2110626-010
SWM 12-01	AWL-21-01541-011	8/27/2021 11:30	9/9/21 16:25	624	1215582004
SWM 12-01	AWL-21-01541-011	8/27/2021 11:30	9/10/21 19:04	625 SIM	1215582004
SWM 12-01	AWL-21-01541-011	8/27/2021 11:30	9/30/21 18:02	200.8 DISS	K2110626-023 - MS/MSD Parent Sample
SWM 12-01	AWL-21-01541-011	8/27/2021 11:30	10/4/21 14:11	200.7	K2110626-011 - Parent Sample for MS/MSD
SWM 12-01 DUP	AWL-21-01541-012	8/27/2021 11:35	9/9/21 16:40	624	1215582005
SWM 12-01 DUP	AWL-21-01541-012	8/27/2021 11:35	9/10/21 19:25	625 SIM	1215582005
SWM 12-01 DUP	AWL-21-01541-012	8/27/2021 11:35	9/30/21 18:14	200.8 DISS	K2110626-024
SWM 12-01 DUP	AWL-21-01541-012	8/27/2021 11:35	10/4/21 14:19	200.7	K2110626-012
SWM 12-01	AWL-21-01541-013	8/27/2021 11:40	9/9/21 13:14	624	1215582006 - Run as Parent for MS/MSD
SWM 12-01	AWL-21-01541-013	8/27/2021 11:40	9/10/21 19:45	625 SIM	1215582006 - Run as Parent for MS/MSD
SWM TripBlank-01	AWL-21-01541-014	8/27/2021 7:30	9/9/21 13:00	624	TRIP BLANK

Analytical Methods

Analyte	Method	Comments
Fecal Coliform	SM9222D MF	
BOD	SM5210B	
TSS	SM2540D	
Hardness	SM2340B	
200.7	200.7	Ca, Mg
200.8	200.8	Cu Dissolved
PAH	624	TAH
TAqH	625 SIM	PAH

Cert Required None
CMDP #

Log In Initials: MCC 9-2-21
DQO Initials: AKS 9-7-21

Comments: Reprot Rev1 to confirm sample locations for MS/MSD and subcontract samples. MCC 11/3/21

Definitions:

DUP	Sample Duplicate
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MRL	Method Reporting Limit
MB	Method Blank
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
N/A	Not Applicable
TNTC	Count is Too Numerous To Count
<MDL	Result recovery is below the detectable laboratory limit, listed as the MDL

Data Qualifiers:

B	The result of both the method blank and the target sample are above the MDL.
D	Sample analysis accomplished through dilution.
J	The reported result is an estimated value above the LOD but below
U	Result is below the MDL, PQL, LOD, or LOQ
*	LCS/LCSD or Sample DUP fails all Duplicate criteria.
H	Holding time exceeded
E	Exceeds MCL

General Comments:

- 1.0) Basis: "As Received" = analyzed as received from client; "Dry" = dried prior to being analyzed; "Dry Weight Corrected" = analyzed as received; result corrected for percent moisture.



281 N Main St., STE # 101
 Wasilla AK, 99654
 907-373-6130

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 9:50
 PWS# None
 AWL Batch ID: 082721-01-FC
 AWL # AWL-21-01541
 Sample SWM 03-01
 Location
 AWL ID/ Fraction AWL-21-01541-001 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1090.09	CFU/100mL	9.01			9.01	SM9222D MF	AKS	8/27/21 15:00	0.1, 1 and 10 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 9:55
 PWS# None
 AWL Batch ID: 082721-01-FC
 AWL # AWL-21-01541
 Sample SWM 04-01
 Location
 AWL ID/ Fraction AWL-21-01541-002 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	702.7	CFU/100mL	9.01			9.01	SM9222D MF	AKS	8/27/21 15:00	0.1, 1 and 10 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 10:30
 PWS# None
 AWL Batch ID: 082721-01-FC
 AWL # AWL-21-01541
 Sample Location SWM 05-01
 AWL ID/ Fraction AWL-21-01541-003 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	4900	CFU/100mL	100			100	SM9222D MF	AKS	8/27/21 15:00	1 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 8:55
 PWS# None
 AWL Batch ID: 082721-01-FC
 AWL # AWL-21-01541
 Sample Location SWM 06-01
 AWL ID/ Fraction AWL-21-01541-004 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	520	CFU/100mL	10			10	SM9222D MF	AKS	8/27/21 15:00	10 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 7:30
 PWS# None
 AWL Batch ID: 082721-01-FC
 AWL # AWL-21-01541
 Sample SWM 07-01
 Location
 AWL ID/ Fraction AWL-21-01541-005 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1603.6	CFU/100mL	9.01			9.01	SM9222D MF	AKS	8/27/21 15:00	0.1, 1 and 10 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 7:45
 PWS# None
 AWL Batch ID: 082721-01-FC
 AWL # AWL-21-01541
 Sample SWM 08-01
 Location
 AWL ID/ Fraction AWL-21-01541-006 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1234.23	CFU/100mL	9.01			9.01	SM9222D MF	AKS	8/27/21 15:00	0.1, 1 and 10 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 7:50
 PWS# None
 AWL Batch ID: 082721-02-FC
 AWL # AWL-21-01541
 Sample SWM 08-01 DUP
 Location
 AWL ID/ Fraction AWL-21-01541-007 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1279.28	CFU/100mL	9.01			9.01	SM9222D MF	AKS	8/27/21 15:31	0.1, 1 and 10 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 8:15
 PWS# None
 AWL Batch ID: 082721-02-FC
 AWL # AWL-21-01541
 Sample SWM 09-01
 Location
 AWL ID/ Fraction AWL-21-01541-008 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1234.23	CFU/100mL	9.01			9.01	SM9222D MF	AKS	8/27/21 15:31	0.1, 1 and 10 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 8:30
 PWS# None
 AWL Batch ID: 082721-02-FC
 AWL # AWL-21-01541
 Sample Location SWM 10-01
 AWL ID/ Fraction AWL-21-01541-009 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1818.18	CFU/100mL	90.91			90.91	SM9222D MF	AKS	8/27/21 15:31	0.1 and 1 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 9:25
 PWS# None
 AWL Batch ID: 082721-02-FC
 AWL # AWL-21-01541
 Sample Location SWM 11-01
 AWL ID/ Fraction AWL-21-01541-010 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	4300	CFU/100mL	100			100	SM9222D MF	AKS	8/27/21 15:31	1 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 11:30
 PWS# None
 AWL Batch ID: 082721-02-FC
 AWL # AWL-21-01541
 Sample SWM 12-01
 Location
 AWL ID/ Fraction AWL-21-01541-011 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	2700	CFU/100mL	100			100	SM9222D MF	AKS	8/27/21 15:31	1 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 11:35
 PWS# None
 AWL Batch ID: 082721-02-FC
 AWL # AWL-21-01541
 Sample Location SWM 12-01 DUP
 AWL ID/ Fraction AWL-21-01541-012 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	4900	CFU/100mL	100			100	SM9222D MF	AKS	8/27/21 15:31	1 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 11:40
 PWS# None
 AWL Batch ID: 082721-02-FC
 AWL # AWL-21-01541
 Sample SWM 12-01
 Location
 AWL ID/ Fraction AWL-21-01541-013 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	3200	CFU/100mL	100			100	SM9222D MF	AKS	8/27/21 15:31	1 used

Analyst Batching initials/date AKS 9-7-21
 Analyst reviewer initials/date MCC 9-8-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 9:50
 PWS# None

AWL # AWL-21-01541
 Sample SWM 03-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	2.82	mg/L	3	0.9		D,J	3	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	25.59	mg/L	13.1836	5.92			1.18	SM2540D	JTR	9/3/21 16:22	090321-01-TSS
Comments											
Hardness	39.21	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 9:55
 PWS# None

AWL # AWL-21-01541
 Sample SWM 04-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	2.73	mg/L	3	0.9		D,J	3	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	11.38	mg/L	12.7897	5.75		J	1.15	SM2540D	JTR	9/3/21 16:22	090321-01-TSS
Comments											
Hardness	37.35	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
 AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 10:30
 PWS# None

AWL # AWL-21-01541
 Sample SWM 05-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	3.90	mg/L	3	0.9		D	3	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	45.17	mg/L	18.545	8.33			1.67	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	25.33	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)



Batch ID	100921-01-TAqH
Batching Initials/Date	MCC 10-9-21
Validation	AKS 10-11-21
AWL ID	AWL-21-01541-003
Sample ID	SWM 05-01

Sampling Date	8/27/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>8/27/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.00
<u>625 PAH</u>	<u>8/27/2021</u>
Acenaphthylene	<0.0236
Acenaphthene	<0.0236
Anthracene	<0.0236
Benzo(a)anthracene	<0.0236
Benzo(a)pyrene	<0.00945
Benzo(b)fluoranthene	<0.0236
Benzo(g,h,i)perylene	<0.0236
Benzo(k)fluoranthene	<0.0236
Chrysene	<0.0236
Dibenzo(a,h)anthracene	<0.00945
Fluoranthene	0.0194
Fluorene	<0.0236
Indeno(1,2,3-cd)pyrene	<0.0236
Naphthalene	<0.0471
Phenanthrene	0.0248
Pyrene	0.0195
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.064
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 8:55
 PWS# None

AWL # AWL-21-01541
 Sample SWM 06-01
 Location
 AWL ID/ Fraction AWL-21-01541-004 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	3.00	mg/L	3	0.9		D	3	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	26.13	mg/L	12.8636	5.78035			1.16	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	7.91	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 7:30
 PWS# None

AWL # AWL-21-01541
 Sample SWM 07-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	17.80	mg/L	20	6		D,J	20	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	180.80	mg/L	44.508	20			4	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	26.39	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
 AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)



Batch ID	100921-02-TAqH
Batching Initials/Date	MCC 10-9-21
Validation	AKS 10-11-21
AWL ID	AWL-21-01541-005
Sample ID	SWM 07-01

Sampling Date	8/27/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>8/27/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>8/27/2021</u>
Acenaphthylene	<0.0236
Acenaphthene	<0.0236
Anthracene	<0.0236
Benzo(a)anthracene	<0.0236
Benzo(a)pyrene	<0.00945
Benzo(b)fluoranthene	0.0318
Benzo(g,h,i)perylene	0.0301
Benzo(k)fluoranthene	<0.0236
Chrysene	0.0223
Dibenzo(a,h)anthracene	<0.00945
Fluoranthene	0.0441
Fluorene	<0.0236
Indeno(1,2,3-cd)pyrene	<0.0236
Naphthalene	<0.0471
Phenanthrene	0.0341
Pyrene	0.0547
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.217
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 7:45
 PWS# None

AWL # AWL-21-01541
 Sample SWM 08-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	7.97	mg/L	8.57	2.57		D,J	8.57	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	88.60	mg/L	22.254	10			2	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	10.95	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 7:50
 PWS# None

AWL # AWL-21-01541
 Sample SWM 08-01 DUP
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	8.06	mg/L	8.57	2.57		D,J	8.57	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	81.50	mg/L	18.545	8.33			1.67	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	10.54	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 8:15
 PWS# None

AWL # AWL-21-01541
 Sample SWM 09-01
 Location
 AWL ID/ Fraction AWL-21-01541-008 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	3.75	mg/L	3	0.9		D	3	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	11.07	mg/L	12.9685	5.83		J	1.17	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	5.16	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
 AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)



Batch ID	100921-03-TAqH
Batching Initials/Date	MCC 10-9-21
Validation	AKS 10-11-21
AWL ID	AWL-21-01541-008
Sample ID	SWM09-01

Sampling Date	8/27/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>8/27/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>8/27/2021</u>
Acenaphthylene	<0.0245
Acenaphthene	<0.0245
Anthracene	<0.0245
Benzo(a)anthracene	<0.0245
Benzo(a)pyrene	<0.00980
Benzo(b)fluoranthene	<0.0245
Benzo(g,h,i)perylene	<0.0245
Benzo(k)fluoranthene	<0.0245
Chrysene	<0.0245
Dibenzo(a,h)anthracene	<0.00980
Fluoranthene	<0.0245
Fluorene	<0.0245
Indeno(1,2,3-cd)pyrene	<0.0245
Naphthalene	<0.490
Phenanthrene	0.0177
Pyrene	<0.0245
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.018
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 8:30
 PWS# None

AWL # AWL-21-01541
 Sample SWM 10-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	19.40	mg/L	20	6		D,J	20	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	44.50	mg/L	18.545	8.33			1.67	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	37.74	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-03-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 9:25
 PWS# None

AWL # AWL-21-01541
 Sample SWM 11-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	2.82	mg/L	3	0.9		D,J	3	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments											
TSS	19.37	mg/L	12.5304	5.63			1.13	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	18.44	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-03-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 11:30
 PWS# None

AWL # AWL-21-01541
 Sample SWM 12-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	23.10	mg/L	30	9		D,J	30	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments	All Dilutions under-depleted, the result is considered an estimate-AKS 9-10-21										
TSS	217.00	mg/L	55.635	25			5	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	59.39	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-03-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)



Batch ID	100921-04-TAqH
Batching Initials/Date	MCC 10-9-21
Validation	AKS 10-11-21
AWL ID	AWL-21-01541-011
Sample ID	SWM12-01

Sampling Date	8/27/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>8/27/2021</u>
Benzene	<0.200
Toluene	0.78
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>8/27/2021</u>
Acenaphthylene	<0.0240
Acenaphthene	<0.0240
Anthracene	<0.0240
Benzo(a)anthracene	<0.0240
Benzo(a)pyrene	<0.00960
Benzo(b)fluoranthene	0.0385
Benzo(g,h,i)perylene	0.32
Benzo(k)fluoranthene	<0.0240
Chrysene	0.0239
Dibenzo(a,h)anthracene	<0.00960
Fluoranthene	0.058
Fluorene	<0.0240
Indeno(1,2,3-cd)pyrene	0.0166
Naphthalene	<0.0481
Phenanthrene	0.0424
Pyrene	0.0568
Total Aqueous Aromatic Hydrocarbons (TAqH)	1.336
Total Aromatic Hydrocarbons (TAH)	0.780

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 11:35
 PWS# None

AWL # AWL-21-01541
 Sample SWM 12-01 DUP
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	14.20	mg/L	20	6		D,J	20	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments	All Dilutions under-depleted, the result is considered an estimate-AKS 9-10-21										
TSS	210.67	mg/L	37.09	16.6667			3.33	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											
Hardness	55.91	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-03-Hardness
Comments											

Analyst Batching initials/date

JTR 9-10-21 (TSS), AKS 9-10-21(BOD), MCC 10-6-21 (Hardness)

Analyst reviewer initials/date

AKS 9-10-21(TSS), JTR 9-13-21 (BOD), AKS 10-7-21(Hardness)



Batch ID	100921-05-TAqH
Batching Initials/Date	MCC 10-9-21
Validation	AKS 10-11-21
AWL ID	AWL-21-01541-012
Sample ID	SWM12-01 DUP

Sampling Date	8/27/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>8/27/2021</u>
Benzene	<0.200
Toluene	0.78
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>8/27/2021</u>
Acenaphthylene	<0.0240
Acenaphthene	<0.0240
Anthracene	<0.0240
Benzo(a)anthracene	<0.0240
Benzo(a)pyrene	<0.00960
Benzo(b)fluoranthene	0.401
Benzo(g,h,i)perylene	0.0347
Benzo(k)fluoranthene	<0.0240
Chrysene	0.0231
Dibenzo(a,h)anthracene	<0.00960
Fluoranthene	0.0502
Fluorene	<0.0240
Indeno(1,2,3-cd)pyrene	0.0163
Naphthalene	<0.0481
Phenanthrene	0.031
Pyrene	0.0582
Total Aqueous Aromatic Hydrocarbons (TAqH)	1.395
Total Aromatic Hydrocarbons (TAH)	0.780

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 8/27/21 11:40
 PWS# None

AWL # AWL-21-01541
 Sample SWM 12-01
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	21.90	mg/L	30	9		D,J	30	SM5210B	AKS	8/27/21 17:06	082721-01-BOD
Comments	All Dilutions under-depleted, the result is considered an estimate-AKS 9-10-21										
TSS	203.50	mg/L	55.635	25			5	SM2540D	JTR	9/1/21 12:45	090121-01-TSS
Comments											

Analyst Batching initials/date JTR 9-10-21 (TSS), AKS 9-10-21(BOD)
 Analyst reviewer initials/date AKS 9-10-21(TSS), JTR 9-13-21 (BOD)



Batch ID	101121-01-TAqH
Batching Initials/Date	MCC 10-11-21
Validation	AKS 10-11-21
AWL ID	AWL-21-01541-013
Sample ID	SWM12-01 MS MSD

Sampling Date	8/27/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>8/27/2021</u>
Benzene	<0.200
Toluene	0.79
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>8/27/2021</u>
Acenaphthylene	<0.0236
Acenaphthene	<0.0236
Anthracene	<0.0236
Benzo(a)anthracene	<0.0236
Benzo(a)pyrene	<0.00945
Benzo(b)fluoranthene	<0.0236
Benzo(g,h,i)perylene	0.0264
Benzo(k)fluoranthene	<0.0236
Chrysene	0.0186
Dibenzo(a,h)anthracene	<0.00945
Fluoranthene	0.0432
Fluorene	<0.0236
Indeno(1,2,3-cd)pyrene	<0.0236
Naphthalene	<0.0471
Phenanthrene	0.0322
Pyrene	0.0455
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.956
Total Aromatic Hydrocarbons (TAH)	0.790

Alaska Laboratory# AK01000

Analysis QC Results

BOD SM 5210B

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
BOD	0.12		0.3	0.9		AKS	8/27/2021 17:06

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
BOD	177.15		206	86.00	85-115	AKS	8/27/2021 17:06

Sample Duplicate

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
BOD	183.10		196.83	7.23	≤20	AKS	8/27/2021 17:06

Total Suspended Solids SM2540D

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
TSS	-0.10		5	11.1		JTR	9/1/2021 12:45

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
TSS	74.00		77.4	95.61	90-110	JTR	9/1/2021 12:45

Sample Duplicate 1

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	183.60		180.80	1.54	≤20	JTR	9/1/2021 12:45

Sample Duplicate 2

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	197.00		203.50	3.25	≤20	JTR	9/1/2021 12:45

Total Suspended Solids SM2540D

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
TSS	-0.40		5	11.1		JTR	9/3/2021 16:22

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
TSS	75.33		77.4	97.33	90-110	JTR	9/3/2021 16:22

Sample Duplicate 1

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	2980.00		2980.00	0.00	≤20	JTR	9/3/2021 16:22

Sample Duplicate 2

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	105.50		103.00	2.40	≤20	JTR	9/3/2021 16:22



October 05, 2021

Service Request No:K2110626

Mary Curry
Alaska Water Laboratories
281 N. Main Street, Suite #101
Wasilla, AK 99654

Laboratory Results for: AWL-21-01541

Dear Mary,

Enclosed are the results of the sample(s) submitted to our laboratory September 13, 2021
For your reference, these analyses have been assigned our service request number **K2110626**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Received: 09/13/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twenty four wastewater samples were received for analysis at ALS Environmental on 09/13/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy

Date 10/05/2021



SAMPLE DETECTION SUMMARY

CLIENT ID: AWL-21-01541-009-4 **Lab ID: K2110626-021**

Analyte	Results	Flag	MDL	MRL	Units	Method
---------	---------	------	-----	-----	-------	--------

CLIENT ID: AWL-21-01541-010-4 **Lab ID: K2110626-022**

Analyte	Results	Flag	MDL	MRL	Units	Method
---------	---------	------	-----	-----	-------	--------

Copper, Dissolved	2.54		0.05	0.10	ug/L	200.8
-------------------	------	--	------	------	------	-------

CLIENT ID: AWL-21-01541-011-6/013-6 **Lab ID: K2110626-023**

Analyte	Results	Flag	MDL	MRL	Units	Method
---------	---------	------	-----	-----	-------	--------

Copper, Dissolved	3.56		0.05	0.10	ug/L	200.8
-------------------	------	--	------	------	------	-------

CLIENT ID: AWL-21-01541-012-6 **Lab ID: K2110626-024**

Analyte	Results	Flag	MDL	MRL	Units	Method
---------	---------	------	-----	-----	-------	--------

Copper, Dissolved	3.70		0.05	0.10	ug/L	200.8
-------------------	------	--	------	------	------	-------



Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Alaska Water Laboratories
Project: AWL-21-01541

Service Request:K2110626

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2110626-001	AWL-21-01541-001-2	8/27/2021	0950
K2110626-002	AWL-21-01541-002-2	8/27/2021	0955
K2110626-003	AWL-21-01541-003-2	8/27/2021	1030
K2110626-004	AWL-21-01541-004-2	8/27/2021	0855
K2110626-005	AWL-21-01541-005-2	8/27/2021	0730
K2110626-006	AWL-21-01541-006-2	8/27/2021	0745
K2110626-007	AWL-21-01541-007-2	8/27/2021	0750
K2110626-008	AWL-21-01541-008-2	8/27/2021	0815
K2110626-009	AWL-21-01541-009-2	8/27/2021	0830
K2110626-010	AWL-21-01541-010-2	8/27/2021	0925
K2110626-011	AWL-21-01541-011-2/-013-2-1/013-2-2	8/27/2021	1130
K2110626-012	AWL-21-01541-012-2	8/27/2021	1135
K2110626-013	AWL-21-01541-001-4	8/27/2021	0950
K2110626-014	AWL-21-01541-002-4	8/27/2021	0955
K2110626-015	AWL-21-01541-003-6	8/27/2021	1030
K2110626-016	AWL-21-01541-004-4	8/27/2021	0855
K2110626-017	AWL-21-01541-005-6	8/27/2021	0730
K2110626-018	AWL-21-01541-006-4	8/27/2021	0745
K2110626-019	AWL-21-01541-007-4	8/27/2021	0750
K2110626-020	AWL-21-01541-008-6	8/27/2021	0815
K2110626-021	AWL-21-01541-009-4	8/27/2021	0830
K2110626-022	AWL-21-01541-010-4	8/27/2021	0925
K2110626-023	AWL-21-01541-011-6/-013-6	8/27/2021	1130
K2110626-024	AWL-21-01541-012-6	8/27/2021	1135

K 2110626



281 N Main St., STE # 101
Wasilla AK, 99654
907-373-6130

PM: Kelley Lovejoy

FROM: Alaska Water Laboratories LLC.
281 N. Main St, STE101
Wasilla AK 99654

ALS Environmental
Attn: Sample Receiving
1317 S. 13th Ave
Kelso, WA 98626

Client Project Name: AWL-21-01541

Certification Required: 360-577-7222

Requested Due Date (if not standard TAT): Standard

* Alaska Waste Water
* Report to MDL; EDD ~~via~~ LINKO w/ report

Samples				
AWL ID	Collection Date/ Time	Analysis	Comments	Matrix
AWL-21-01541-001-2	8/27/2021 9:50	200.7	Ca & Mg	WW
AWL-21-01541-002-2	8/27/2021 9:55	200.7	Ca & Mg	WW
AWL-21-01541-003-2	8/27/2021 10:30	200.7	Ca & Mg	WW
AWL-21-01541-004-2	8/27/2021 8:55	200.7	Ca & Mg	WW
AWL-21-01541-005-2	8/27/2021 7:30	200.7	Ca & Mg	WW
AWL-21-01541-006-2	8/27/2021 7:45	200.7	Ca & Mg	WW
AWL-21-01541-007-2	8/27/2021 7:50	200.7	Ca & Mg	WW
AWL-21-01541-008-2	8/27/2021 8:15	200.7	Ca & Mg	WW
AWL-21-01541-009-2	8/27/2021 8:30	200.7	Ca & Mg	WW
AWL-21-01541-010-2	8/27/2021 9:25	200.7	Ca & Mg	WW
AWL-21-01541-011-2	8/27/2021 11:30	200.7	Ca & Mg	WW
AWL-21-01541-012-2	8/27/2021 11:35	200.7	Ca & Mg	WW
AWL-21-01541-013-2-1	8/27/2021 11:40	200.7	Ca & Mg MS	WW
AWL-21-01541-013-2-2	8/27/2021 11:40	200.7	Ca & Mg, MSD	WW
AWL-21-01541-001-4	8/27/2021 9:50	200.8	Dissolved Cu	WW
AWL-21-01541-002-4	8/27/2021 9:55	200.8	Dissolved Cu	WW
AWL-21-01541-003-6	8/27/2021 10:30	200.8	Dissolved Cu	WW
AWL-21-01541-004-4	8/27/2021 8:55	200.8	Dissolved Cu	WW
AWL-21-01541-005-6	8/27/2021 7:30	200.8	Dissolved Cu	WW
AWL-21-01541-006-4	8/27/2021 7:45	200.8	Dissolved Cu	WW
AWL-21-01541-007-4	8/27/2021 7:50	200.8	Dissolved Cu	WW
AWL-21-01541-008-6	8/27/2021 8:15	200.8	Dissolved Cu	WW
AWL-21-01541-009-4	8/27/2021 8:30	200.8	Dissolved Cu	WW
AWL-21-01541-010-4	8/27/2021 9:25	200.8	Dissolved Cu	WW
AWL-21-01541-011-6	8/27/2021 11:30	200.8	Dissolved Cu	WW
AWL-21-01541-012-6	8/27/2021 11:35	200.8	Dissolved Cu	WW
AWL-21-01541-013-6	8/27/2021 11:40	200.8	Dissolved Cu (QC MS)	WW
AWL-21-01541-013-6	8/27/2021 11:40	200.8	Dissolved Cu (QC MSD)	WW
Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
mcc	9-8-21 10:18		9-13-21 1100	
Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
				CoC Seal? Y / N

Cooler Receipt and Preservation Form

Client Alaska Waste Water Service Request K21 10626

Received: 9-13-21 Opened: 9-13-21 By: AW Unloaded: 9-13-21 By: AW

- 1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
 - 2. Samples were received in: (circle) Cooler Box Envelope Other _____ NA
 - 3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
If present, were custody seals intact? Y N If present, were they signed and dated? Y N
 - 4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
 - 5. Were samples received within the method specified temperature ranges? NA Y N
If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N
- If applicable, tissue samples were received: Frozen Partially Thawed Thawed

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
						9406103699300021815329	
						9406103699300021815356	

- 6. Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves _____
- 7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- 8. Were samples received in good condition (unbroken) NA Y N
- 9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
- 10. Did all sample labels and tags agree with custody papers? NA Y N
- 11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- 12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
- 13. Were VOA vials received without headspace? Indicate in the table below NA Y N
- 14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____



Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01541/

Service Request: K2110626

Sample Name: AWL-21-01541-001-2
Lab Code: K2110626-001
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-002-2
Lab Code: K2110626-002
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-003-2
Lab Code: K2110626-003
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-004-2
Lab Code: K2110626-004
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-005-2
Lab Code: K2110626-005
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01541/

Service Request: K2110626

Sample Name: AWL-21-01541-006-2
Lab Code: K2110626-006
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-007-2
Lab Code: K2110626-007
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-008-2
Lab Code: K2110626-008
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-009-2
Lab Code: K2110626-009
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-010-2
Lab Code: K2110626-010
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01541/

Service Request: K2110626

Sample Name: AWL-21-01541-011-2/-013-2-1/013-2-2
Lab Code: K2110626-011
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-012-2
Lab Code: K2110626-012
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01541-001-4
Lab Code: K2110626-013
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-002-4
Lab Code: K2110626-014
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-003-6
Lab Code: K2110626-015
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01541/

Service Request: K2110626

Sample Name: AWL-21-01541-004-4
Lab Code: K2110626-016
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-005-6
Lab Code: K2110626-017
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-006-4
Lab Code: K2110626-018
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-007-4
Lab Code: K2110626-019
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-008-6
Lab Code: K2110626-020
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01541/

Service Request: K2110626

Sample Name: AWL-21-01541-009-4
Lab Code: K2110626-021
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-010-4
Lab Code: K2110626-022
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-011-6/-013-6
Lab Code: K2110626-023
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01541-012-6
Lab Code: K2110626-024
Sample Matrix: Wastewater

Date Collected: 08/27/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE



Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-001-2
Lab Code: K2110626-001

Service Request: K2110626
Date Collected: 08/27/21 09:50
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	11100	ug/L	21	3	1	10/04/21 13:28	09/17/21	
Magnesium	200.7	2790	ug/L	5.3	0.4	1	10/04/21 13:28	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-002-2
Lab Code: K2110626-002

Service Request: K2110626
Date Collected: 08/27/21 09:55
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	11100	ug/L	21	3	1	10/04/21 13:36	09/17/21	
Magnesium	200.7	2340	ug/L	5.3	0.4	1	10/04/21 13:36	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-003-2
Lab Code: K2110626-003

Service Request: K2110626
Date Collected: 08/27/21 10:30
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	7340	ug/L	21	3	1	10/04/21 13:39	09/17/21	
Magnesium	200.7	1700	ug/L	5.3	0.4	1	10/04/21 13:39	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-004-2
Lab Code: K2110626-004

Service Request: K2110626
Date Collected: 08/27/21 08:55
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	2170	ug/L	21	3	1	10/04/21 13:41	09/17/21	
Magnesium	200.7	604	ug/L	5.3	0.4	1	10/04/21 13:41	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-005-2
Lab Code: K2110626-005

Service Request: K2110626
Date Collected: 08/27/21 07:30
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	5540	ug/L	21	3	1	10/04/21 13:44	09/17/21	
Magnesium	200.7	3050	ug/L	5.3	0.4	1	10/04/21 13:44	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-006-2
Lab Code: K2110626-006

Service Request: K2110626
Date Collected: 08/27/21 07:45
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	2670	ug/L	21	3	1	10/04/21 13:47	09/17/21	
Magnesium	200.7	1040	ug/L	5.3	0.4	1	10/04/21 13:47	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-007-2
Lab Code: K2110626-007

Service Request: K2110626
Date Collected: 08/27/21 07:50
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	2610	ug/L	21	3	1	10/04/21 13:49	09/17/21	
Magnesium	200.7	977	ug/L	5.3	0.4	1	10/04/21 13:49	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-008-2
Lab Code: K2110626-008

Service Request: K2110626
Date Collected: 08/27/21 08:15
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	1680	ug/L	21	3	1	10/04/21 13:52	09/17/21	
Magnesium	200.7	235	ug/L	5.3	0.4	1	10/04/21 13:52	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-009-2
Lab Code: K2110626-009

Service Request: K2110626
Date Collected: 08/27/21 08:30
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	10000	ug/L	21	3	1	10/04/21 14:06	09/17/21	
Magnesium	200.7	3100	ug/L	5.3	0.4	1	10/04/21 14:06	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-010-2
Lab Code: K2110626-010

Service Request: K2110626
Date Collected: 08/27/21 09:25
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	5900	ug/L	21	3	1	10/04/21 14:09	09/17/21	
Magnesium	200.7	900	ug/L	5.3	0.4	1	10/04/21 14:09	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Collected: 08/27/21 11:30
Date Received: 09/13/21 11:00

Sample Name: AWL-21-01541-011-2/-013-2-1/013-2-2
Lab Code: K2110626-011

Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	16100	ug/L	21	3	1	10/04/21 14:11	09/17/21	
Magnesium	200.7	4660	ug/L	5.3	0.4	1	10/04/21 14:11	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-012-2
Lab Code: K2110626-012

Service Request: K2110626
Date Collected: 08/27/21 11:35
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	15100	ug/L	21	3	1	10/04/21 14:19	09/17/21	
Magnesium	200.7	4420	ug/L	5.3	0.4	1	10/04/21 14:19	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-001-4
Lab Code: K2110626-013

Service Request: K2110626
Date Collected: 08/27/21 09:50
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.33	ug/L	0.10	0.05	1	09/30/21 17:28	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-002-4
Lab Code: K2110626-014

Service Request: K2110626
Date Collected: 08/27/21 09:55
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.75	ug/L	0.10	0.05	1	09/30/21 17:36	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-003-6
Lab Code: K2110626-015

Service Request: K2110626
Date Collected: 08/27/21 10:30
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.84	ug/L	0.10	0.05	1	09/30/21 17:43	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-004-4
Lab Code: K2110626-016

Service Request: K2110626
Date Collected: 08/27/21 08:55
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	0.86	ug/L	0.10	0.05	1	09/30/21 17:45	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-005-6
Lab Code: K2110626-017

Service Request: K2110626
Date Collected: 08/27/21 07:30
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.59	ug/L	0.10	0.05	1	09/30/21 17:48	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-006-4
Lab Code: K2110626-018

Service Request: K2110626
Date Collected: 08/27/21 07:45
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	1.45	ug/L	0.10	0.05	1	09/30/21 17:50	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-007-4
Lab Code: K2110626-019

Service Request: K2110626
Date Collected: 08/27/21 07:50
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	1.57	ug/L	0.10	0.05	1	09/30/21 17:53	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-008-6
Lab Code: K2110626-020

Service Request: K2110626
Date Collected: 08/27/21 08:15
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	1.63	ug/L	0.10	0.05	1	09/30/21 17:55	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-009-4
Lab Code: K2110626-021

Service Request: K2110626
Date Collected: 08/27/21 08:30
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Copper	200.8	1.33	ug/L	0.10	0.05	1	09/30/21 17:57	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-010-4
Lab Code: K2110626-022

Service Request: K2110626
Date Collected: 08/27/21 09:25
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Copper	200.8	2.54	ug/L	0.10	0.05	1	09/30/21 18:00	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-011-6/-013-6
Lab Code: K2110626-023

Service Request: K2110626
Date Collected: 08/27/21 11:30
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	3.56	ug/L	0.10	0.05	1	09/30/21 18:02	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: AWL-21-01541-012-6
Lab Code: K2110626-024

Service Request: K2110626
Date Collected: 08/27/21 11:35
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	3.70	ug/L	0.10	0.05	1	09/30/21 18:14	09/17/21	



QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: Method Blank
Lab Code: KQ2118074-03

Service Request: K2110626
Date Collected: NA
Date Received: NA
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	2 J	ug/L	21	0.9	1	10/04/21 13:15	09/17/21	
Magnesium	200.7	0.6 J	ug/L	5.3	0.3	1	10/04/21 13:15	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater
Sample Name: Method Blank
Lab Code: KQ2118079-01

Service Request: K2110626
Date Collected: NA
Date Received: NA
Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Copper	200.8	ND U	ug/L	0.10	0.05	1	09/30/21 17:24	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Collected: 08/27/21
Date Received: 09/13/21
Date Analyzed: 10/4/21
Date Extracted: 09/17/21

Matrix Spike Summary
Total Metals

Sample Name: AWL-21-01541-011-2/-013-2-1/013-2-2
Lab Code: K2110626-011
Analysis Method: 200.7
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2118074-01

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	16100	26100	10000	99	70-130
Magnesium	4660	16000	10000	114	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Collected: 08/27/21
Date Received: 09/13/21
Date Analyzed: 10/4/21
Date Extracted: 09/17/21

Matrix Spike Summary
Total Metals

Sample Name: AWL-21-01541-001-2
Lab Code: K2110626-001
Analysis Method: 200.7
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2118074-07

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	11100	21300	10000	101	70-130
Magnesium	2790	14100	10000	113	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Collected: 08/27/21
Date Received: 09/13/21
Date Analyzed: 09/30/21
Date Extracted: 09/17/21

Matrix Spike Summary
Dissolved Metals

Sample Name: AWL-21-01541-001-4
Lab Code: K2110626-013
Analysis Method: 200.8
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2118079-06

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Copper	2.33	14.6	12.5	98	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Collected: 08/27/21
Date Received: 09/13/21
Date Analyzed: 10/04/21

Replicate Sample Summary

Total Metals

Sample Name: AWL-21-01541-011-2/-013-2-1/013-2-2
Lab Code: K2110626-011

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2118074-05 Result			
Calcium	200.7	21	0.9	16100	16100	16100	<1	20
Magnesium	200.7	5.3	0.3	4660	4730	4700	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Collected: 08/27/21
Date Received: 09/13/21
Date Analyzed: 10/04/21

Replicate Sample Summary

Total Metals

Sample Name: AWL-21-01541-001-2
Lab Code: K2110626-001

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2118074-06 Result			
Calcium	200.7	21	0.9	11100	11000	11100	<1	20
Magnesium	200.7	5.3	0.3	2790	2790	2790	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Collected: 08/27/21
Date Received: 09/13/21
Date Analyzed: 09/30/21

Replicate Sample Summary
Dissolved Metals

Sample Name: AWL-21-01541-001-4
Lab Code: K2110626-013

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2118079-05 Result			
Copper	200.8	0.10	0.05	2.33	2.26	2.30	3	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Analyzed: 10/04/21

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2118074-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Calcium	200.7	12800	12500	103	85-115
Magnesium	200.7	13600	12500	109	85-115

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01541
Sample Matrix: Wastewater

Service Request: K2110626
Date Analyzed: 09/30/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2118079-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Copper	200.8	12.6	12.5	101	85-115

Laboratory Report of Analysis

To: Alaska Water Laboratories LLC.
281 N. Main Street Ste 101
Wasilla, AK 99654
907-373-6130

Report Number: **1215582**

Client Project: **AWL-21-01541**

Dear Mary Curry,

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 SGS at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

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

Sincerely,
SGS North America Inc.



Justin Nelson
2021.10.11
11:46:36 -08'00'

SGS Anchorage
Project Manager
ENV.ALASKA.PROJMAN@sgs.com

Date

Print Date: 10/11/2021 11:23:29AM

Case Narrative

SGS Client: **Alaska Water Laboratories LLC.**

SGS Project: **1215582**

Project Name/Site: **AWL-21-01541**

Project Contact: **Mary Curry**

Refer to sample receipt form for information on sample condition.

AWL-21-01541-005 (1215582002) PS

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria. The sample was re-extracted outside of hold time to confirm results. Results are comparable and in-hold data is reported.

AWL-21-01541-011 (1215582004) PS

8270D SIM - PAH surrogate recoveries for fluoranthene-d10 and 2-methylnaphthalene-d10 do not meet QC criteria. The sample was re-extracted outside of hold time to confirm results. Results are comparable and in-hold data is reported.

AWL-21-01541-012 (1215582005) PS

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria. The sample was re-extracted outside of hold time to confirm results. Results are comparable and in-hold data is reported.

AWL-21-01541-013 (1215582006) PS

8270D SIM - PAH surrogate recoveries for fluoranthene-d10 and 2-methylnaphthalene-d10 do not meet QC criteria.

AWL-21-01541...(1215582006BMS) (1215582007) BMS

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria.
8270D SIM - PAH BMS recoveries for multiple analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

AWL-21-0154...(1215582006BMSD) (1215582008) BMSD

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria.
8270D SIM - PAH BMSD recoveries for multiple analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

LCSD for HBN 1825332 [VXX/3780 (1635535) LCSD

8260D - LCSD recovery for methyl-t-butyl ether does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.
8260D - LCS/LCSD RPD for methyl-t-butyl ether does not meet QC criteria. This analyte was not detected above the LOQ in the associated samples.

1215582006MS (1633499) MS

8270D SIM - PAH MS recoveries for multiple analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.
8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria.

1215582006MSD (1633500) MSD

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria.
8270D SIM - PAH MSD recoveries for multiple analytes do not meet QC criteria. Refer to the LCS for accuracy requirements.

*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) LV				
1215582002	AWL-21-01541-005	XMS12878	Chrysene	RP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Print Date: 10/11/2021 11:23:32AM

Laboratory Qualifiers

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

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

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

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

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

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

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
AWL-21-01541-003	1215582001	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)
AWL-21-01541-005	1215582002	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)
AWL-21-01541-008	1215582003	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)
AWL-21-01541-011	1215582004	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)
AWL-21-01541-012	1215582005	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)
AWL-21-01541-013	1215582006	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)
AWL-21-01541...(1215582006BM	1215582007	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)
AWL-21-0154...(1215582006BMS	1215582008	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)
AWL-21-01541-014	1215582009	08/27/2021	08/30/2021	Water (Surface, Eff., Ground)

Method

EPA 602/624
EPA 625M SIM (PAH) LV

Method Description

602 Aromatics by 624 (W)
625 PAH SIM GC/MS Low Volume

Print Date: 10/11/2021 11:23:34AM

Detectable Results Summary

 Client Sample ID: **AWL-21-01541-003**

Lab Sample ID: 1215582001

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Fluoranthene	0.0194J	ug/L
Phenanthrene	0.0248J	ug/L
Pyrene	0.0195J	ug/L

 Client Sample ID: **AWL-21-01541-005**

Lab Sample ID: 1215582002

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[b]Fluoranthene	0.0318J	ug/L
Benzo[g,h,i]perylene	0.0301J	ug/L
Chrysene	0.0223J	ug/L
Fluoranthene	0.0441J	ug/L
Phenanthrene	0.0341J	ug/L
Pyrene	0.0547	ug/L

 Client Sample ID: **AWL-21-01541-008**

Lab Sample ID: 1215582003

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Phenanthrene	0.0177J	ug/L

 Client Sample ID: **AWL-21-01541-011**

Lab Sample ID: 1215582004

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[b]Fluoranthene	0.0385J	ug/L
Benzo[g,h,i]perylene	0.0320J	ug/L
Chrysene	0.0239J	ug/L
Fluoranthene	0.0580	ug/L
Indeno[1,2,3-c,d] pyrene	0.0166J	ug/L
Phenanthrene	0.0424J	ug/L
Pyrene	0.0568	ug/L
Toluene	0.780J	ug/L

Volatile GC/MS

 Client Sample ID: **AWL-21-01541-012**

Lab Sample ID: 1215582005

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[b]Fluoranthene	0.0401J	ug/L
Benzo[g,h,i]perylene	0.0347J	ug/L
Chrysene	0.0231J	ug/L
Fluoranthene	0.0502	ug/L
Indeno[1,2,3-c,d] pyrene	0.0163J	ug/L
Phenanthrene	0.0310J	ug/L
Pyrene	0.0582	ug/L
Toluene	0.780J	ug/L

Volatile GC/MS

 Client Sample ID: **AWL-21-01541-013**

Lab Sample ID: 1215582006

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[g,h,i]perylene	0.0264J	ug/L
Chrysene	0.0186J	ug/L
Fluoranthene	0.0432J	ug/L
Phenanthrene	0.0322J	ug/L
Pyrene	0.0455J	ug/L
Toluene	0.790J	ug/L

Volatile GC/MS

Print Date: 10/11/2021 11:23:36AM

Results of AWL-21-01541-003

Client Sample ID: **AWL-21-01541-003**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582001
 Lab Project ID: 1215582

Collection Date: 08/27/21 10:30
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Acenaphthylene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Benzo(a)Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Benzo[a]pyrene	0.00945 U	0.0189	0.00585	ug/L	1		09/10/21 18:03
Benzo[b]Fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Benzo[g,h,i]perylene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Benzo[k]fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Chrysene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Dibenzo[a,h]anthracene	0.00945 U	0.0189	0.00585	ug/L	1		09/10/21 18:03
Fluoranthene	0.0194 J	0.0472	0.0142	ug/L	1		09/10/21 18:03
Fluorene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Indeno[1,2,3-c,d] pyrene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:03
Naphthalene	0.0471 U	0.0943	0.0292	ug/L	1		09/10/21 18:03
Phenanthrene	0.0248 J	0.0472	0.0142	ug/L	1		09/10/21 18:03
Pyrene	0.0195 J	0.0472	0.0142	ug/L	1		09/10/21 18:03
Surrogates							
2-Methylnaphthalene-d10 (surr)	54.1	42-86		%	1		09/10/21 18:03
Fluoranthene-d10 (surr)	56.4	50-97		%	1		09/10/21 18:03

Batch Information

Analytical Batch: XMS12878
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/10/21 18:03
 Container ID: 1215582001-A

Prep Batch: XXX45485
 Prep Method: SW3535A
 Prep Date/Time: 09/01/21 01:30
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01541-003

Client Sample ID: **AWL-21-01541-003**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582001
 Lab Project ID: 1215582

Collection Date: 08/27/21 10:30
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/09/21 15:41
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/09/21 15:41
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/09/21 15:41
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/09/21 15:41
Toluene	0.500 U	1.00	0.310	ug/L	1		09/09/21 15:41
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		09/09/21 15:41
4-Bromofluorobenzene (surr)	101	85-114		%	1		09/09/21 15:41
Toluene-d8 (surr)	102	89-112		%	1		09/09/21 15:41

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 09/09/21 15:41
 Container ID: 1215582001-C

Prep Batch: VXX37800
 Prep Method: SW5030B
 Prep Date/Time: 09/09/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of AWL-21-01541-005

Client Sample ID: **AWL-21-01541-005**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582002
 Lab Project ID: 1215582

Collection Date: 08/27/21 07:30
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:24
Acenaphthylene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:24
Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:24
Benzo(a)Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:24
Benzo[a]pyrene	0.00945 U	0.0189	0.00585	ug/L	1		09/10/21 18:24
Benzo[b]Fluoranthene	0.0318 J	0.0472	0.0142	ug/L	1		09/10/21 18:24
Benzo[g,h,i]perylene	0.0301 J	0.0472	0.0142	ug/L	1		09/10/21 18:24
Benzo[k]fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:24
Chrysene	0.0223 J	0.0472	0.0142	ug/L	1		09/10/21 18:24
Dibenzo[a,h]anthracene	0.00945 U	0.0189	0.00585	ug/L	1		09/10/21 18:24
Fluoranthene	0.0441 J	0.0472	0.0142	ug/L	1		09/10/21 18:24
Fluorene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:24
Indeno[1,2,3-c,d] pyrene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 18:24
Naphthalene	0.0471 U	0.0943	0.0292	ug/L	1		09/10/21 18:24
Phenanthrene	0.0341 J	0.0472	0.0142	ug/L	1		09/10/21 18:24
Pyrene	0.0547	0.0472	0.0142	ug/L	1		09/10/21 18:24
Surrogates							
2-Methylnaphthalene-d10 (surr)	48.6	42-86		%	1		09/10/21 18:24
Fluoranthene-d10 (surr)	44.3 *	50-97		%	1		09/10/21 18:24

Batch Information

Analytical Batch: XMS12878
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/10/21 18:24
 Container ID: 1215582002-A

Prep Batch: XXX45485
 Prep Method: SW3535A
 Prep Date/Time: 09/01/21 01:30
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01541-005

Client Sample ID: **AWL-21-01541-005**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582002
 Lab Project ID: 1215582

Collection Date: 08/27/21 07:30
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/09/21 15:56
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/09/21 15:56
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/09/21 15:56
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/09/21 15:56
Toluene	0.500 U	1.00	0.310	ug/L	1		09/09/21 15:56
Surrogates							
1,2-Dichloroethane-D4 (surr)	104	81-118		%	1		09/09/21 15:56
4-Bromofluorobenzene (surr)	103	85-114		%	1		09/09/21 15:56
Toluene-d8 (surr)	102	89-112		%	1		09/09/21 15:56

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 09/09/21 15:56
 Container ID: 1215582002-C

Prep Batch: VXX37800
 Prep Method: SW5030B
 Prep Date/Time: 09/09/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of AWL-21-01541-008

Client Sample ID: **AWL-21-01541-008**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582003
 Lab Project ID: 1215582

Collection Date: 08/27/21 08:15
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Acenaphthylene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Anthracene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Benzo(a)Anthracene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Benzo[a]pyrene	0.00980 U	0.0196	0.00608	ug/L	1		09/10/21 18:44
Benzo[b]Fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Benzo[g,h,i]perylene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Benzo[k]fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Chrysene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Dibenzo[a,h]anthracene	0.00980 U	0.0196	0.00608	ug/L	1		09/10/21 18:44
Fluoranthene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Fluorene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Indeno[1,2,3-c,d] pyrene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Naphthalene	0.0490 U	0.0980	0.0304	ug/L	1		09/10/21 18:44
Phenanthrene	0.0177 J	0.0490	0.0147	ug/L	1		09/10/21 18:44
Pyrene	0.0245 U	0.0490	0.0147	ug/L	1		09/10/21 18:44
Surrogates							
2-Methylnaphthalene-d10 (surr)	50.8	42-86		%	1		09/10/21 18:44
Fluoranthene-d10 (surr)	53.3	50-97		%	1		09/10/21 18:44

Batch Information

Analytical Batch: XMS12878
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/10/21 18:44
 Container ID: 1215582003-A

Prep Batch: XXX45485
 Prep Method: SW3535A
 Prep Date/Time: 09/01/21 01:30
 Prep Initial Wt./Vol.: 255 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01541-008

Client Sample ID: **AWL-21-01541-008**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582003
 Lab Project ID: 1215582

Collection Date: 08/27/21 08:15
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/09/21 16:11
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/09/21 16:11
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/09/21 16:11
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/09/21 16:11
Toluene	0.500 U	1.00	0.310	ug/L	1		09/09/21 16:11
Surrogates							
1,2-Dichloroethane-D4 (surr)	113	81-118		%	1		09/09/21 16:11
4-Bromofluorobenzene (surr)	103	85-114		%	1		09/09/21 16:11
Toluene-d8 (surr)	103	89-112		%	1		09/09/21 16:11

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 09/09/21 16:11
 Container ID: 1215582003-C

Prep Batch: VXX37800
 Prep Method: SW5030B
 Prep Date/Time: 09/09/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of AWL-21-01541-011

Client Sample ID: **AWL-21-01541-011**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582004
 Lab Project ID: 1215582

Collection Date: 08/27/21 11:30
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:04
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:04
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:04
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:04
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		09/10/21 19:04
Benzo[b]Fluoranthene	0.0385 J	0.0481	0.0144	ug/L	1		09/10/21 19:04
Benzo[g,h,i]perylene	0.0320 J	0.0481	0.0144	ug/L	1		09/10/21 19:04
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:04
Chrysene	0.0239 J	0.0481	0.0144	ug/L	1		09/10/21 19:04
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		09/10/21 19:04
Fluoranthene	0.0580	0.0481	0.0144	ug/L	1		09/10/21 19:04
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:04
Indeno[1,2,3-c,d] pyrene	0.0166 J	0.0481	0.0144	ug/L	1		09/10/21 19:04
Naphthalene	0.0481 U	0.0962	0.0298	ug/L	1		09/10/21 19:04
Phenanthrene	0.0424 J	0.0481	0.0144	ug/L	1		09/10/21 19:04
Pyrene	0.0568	0.0481	0.0144	ug/L	1		09/10/21 19:04
Surrogates							
2-Methylnaphthalene-d10 (surr)	19.8	*	42-86	%	1		09/10/21 19:04
Fluoranthene-d10 (surr)	21.3	*	50-97	%	1		09/10/21 19:04

Batch Information

Analytical Batch: XMS12878
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/10/21 19:04
 Container ID: 1215582004-A

Prep Batch: XXX45485
 Prep Method: SW3535A
 Prep Date/Time: 09/01/21 01:30
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01541-011

Client Sample ID: **AWL-21-01541-011**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582004
 Lab Project ID: 1215582

Collection Date: 08/27/21 11:30
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/09/21 16:25
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/09/21 16:25
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/09/21 16:25
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/09/21 16:25
Toluene	0.780 J	1.00	0.310	ug/L	1		09/09/21 16:25
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		09/09/21 16:25
4-Bromofluorobenzene (surr)	100	85-114		%	1		09/09/21 16:25
Toluene-d8 (surr)	102	89-112		%	1		09/09/21 16:25

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 09/09/21 16:25
 Container ID: 1215582004-C

Prep Batch: VXX37800
 Prep Method: SW5030B
 Prep Date/Time: 09/09/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of AWL-21-01541-012

Client Sample ID: **AWL-21-01541-012**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582005
 Lab Project ID: 1215582

Collection Date: 08/27/21 11:35
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:25
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:25
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:25
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:25
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		09/10/21 19:25
Benzo[b]Fluoranthene	0.0401 J	0.0481	0.0144	ug/L	1		09/10/21 19:25
Benzo[g,h,i]perylene	0.0347 J	0.0481	0.0144	ug/L	1		09/10/21 19:25
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:25
Chrysene	0.0231 J	0.0481	0.0144	ug/L	1		09/10/21 19:25
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		09/10/21 19:25
Fluoranthene	0.0502	0.0481	0.0144	ug/L	1		09/10/21 19:25
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		09/10/21 19:25
Indeno[1,2,3-c,d] pyrene	0.0163 J	0.0481	0.0144	ug/L	1		09/10/21 19:25
Naphthalene	0.0481 U	0.0962	0.0298	ug/L	1		09/10/21 19:25
Phenanthrene	0.0310 J	0.0481	0.0144	ug/L	1		09/10/21 19:25
Pyrene	0.0582	0.0481	0.0144	ug/L	1		09/10/21 19:25
Surrogates							
2-Methylnaphthalene-d10 (surr)	49.8	42-86		%	1		09/10/21 19:25
Fluoranthene-d10 (surr)	43.6 *	50-97		%	1		09/10/21 19:25

Batch Information

Analytical Batch: XMS12878
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/10/21 19:25
 Container ID: 1215582005-A

Prep Batch: XXX45485
 Prep Method: SW3535A
 Prep Date/Time: 09/01/21 01:30
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01541-012

Client Sample ID: **AWL-21-01541-012**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582005
 Lab Project ID: 1215582

Collection Date: 08/27/21 11:35
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/09/21 16:40
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/09/21 16:40
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/09/21 16:40
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/09/21 16:40
Toluene	0.780 J	1.00	0.310	ug/L	1		09/09/21 16:40
Surrogates							
1,2-Dichloroethane-D4 (surr)	103	81-118		%	1		09/09/21 16:40
4-Bromofluorobenzene (surr)	102	85-114		%	1		09/09/21 16:40
Toluene-d8 (surr)	103	89-112		%	1		09/09/21 16:40

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 09/09/21 16:40
 Container ID: 1215582005-C

Prep Batch: VXX37800
 Prep Method: SW5030B
 Prep Date/Time: 09/09/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of AWL-21-01541-013

Client Sample ID: **AWL-21-01541-013**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582006
 Lab Project ID: 1215582

Collection Date: 08/27/21 11:40
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Acenaphthene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 19:45
Acenaphthylene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 19:45
Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 19:45
Benzo(a)Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 19:45
Benzo[a]pyrene	0.00945 U	0.0189	0.00585	ug/L	1		09/10/21 19:45
Benzo[b]Fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 19:45
Benzo[g,h,i]perylene	0.0264 J	0.0472	0.0142	ug/L	1		09/10/21 19:45
Benzo[k]fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 19:45
Chrysene	0.0186 J	0.0472	0.0142	ug/L	1		09/10/21 19:45
Dibenzo[a,h]anthracene	0.00945 U	0.0189	0.00585	ug/L	1		09/10/21 19:45
Fluoranthene	0.0432 J	0.0472	0.0142	ug/L	1		09/10/21 19:45
Fluorene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 19:45
Indeno[1,2,3-c,d] pyrene	0.0236 U	0.0472	0.0142	ug/L	1		09/10/21 19:45
Naphthalene	0.0471 U	0.0943	0.0292	ug/L	1		09/10/21 19:45
Phenanthrene	0.0322 J	0.0472	0.0142	ug/L	1		09/10/21 19:45
Pyrene	0.0455 J	0.0472	0.0142	ug/L	1		09/10/21 19:45
Surrogates							
2-Methylnaphthalene-d10 (surr)	41.1	*	42-86	%	1		09/10/21 19:45
Fluoranthene-d10 (surr)	34	*	50-97	%	1		09/10/21 19:45

Batch Information

Analytical Batch: XMS12878
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/10/21 19:45
 Container ID: 1215582006-A

Prep Batch: XXX45485
 Prep Method: SW3535A
 Prep Date/Time: 09/01/21 01:30
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01541-013

Client Sample ID: **AWL-21-01541-013**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582006
 Lab Project ID: 1215582

Collection Date: 08/27/21 11:40
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/09/21 13:14
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/09/21 13:14
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/09/21 13:14
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/09/21 13:14
Toluene	0.790 J	1.00	0.310	ug/L	1		09/09/21 13:14
Surrogates							
1,2-Dichloroethane-D4 (surr)	106	81-118		%	1		09/09/21 13:14
4-Bromofluorobenzene (surr)	100	85-114		%	1		09/09/21 13:14
Toluene-d8 (surr)	109	89-112		%	1		09/09/21 13:14

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 09/09/21 13:14
 Container ID: 1215582006-C

Prep Batch: VXX37800
 Prep Method: SW5030B
 Prep Date/Time: 09/09/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of AWL-21-01541-014

Client Sample ID: **AWL-21-01541-014**
 Client Project ID: **AWL-21-01541**
 Lab Sample ID: 1215582009
 Lab Project ID: 1215582

Collection Date: 08/27/21 07:30
 Received Date: 08/30/21 14:11
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.200 U	0.400	0.120	ug/L	1		09/09/21 13:00
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/09/21 13:00
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/09/21 13:00
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/09/21 13:00
Toluene	0.500 U	1.00	0.310	ug/L	1		09/09/21 13:00
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		09/09/21 13:00
4-Bromofluorobenzene (surr)	102	85-114		%	1		09/09/21 13:00
Toluene-d8 (surr)	101	89-112		%	1		09/09/21 13:00

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 09/09/21 13:00
 Container ID: 1215582009-A

Prep Batch: VXX37800
 Prep Method: SW5030B
 Prep Date/Time: 09/09/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1825332 [VXX/37800]
 Blank Lab ID: 1635533

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1215582001, 1215582002, 1215582003, 1215582004, 1215582005, 1215582006, 1215582009

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	104	81-118		%
4-Bromofluorobenzene (surr)	103	85-114		%
Toluene-d8 (surr)	103	89-112		%

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: MDT
 Analytical Date/Time: 9/9/2021 10:30:00AM

Prep Batch: VXX37800
 Prep Method: SW5030B
 Prep Date/Time: 9/9/2021 6:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Print Date: 10/11/2021 11:23:40AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1215582 [VXX37800]
 Blank Spike Lab ID: 1635534
 Date Analyzed: 09/09/2021 10:44

Spike Duplicate ID: LCSD for HBN 1215582 [VXX37800]
 Spike Duplicate Lab ID: 1635535
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1215582001, 1215582002, 1215582003, 1215582004, 1215582005, 1215582006, 1215582009

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	30	30.3	101	30	29.5	98	(79-120)	2.70	(< 20)
Ethylbenzene	30	32.0	107	30	32.5	108	(79-121)	1.70	(< 20)
o-Xylene	30	32.1	107	30	32.7	109	(78-122)	1.60	(< 20)
P & M -Xylene	60	64.2	107	60	65.3	109	(80-121)	1.80	(< 20)
Toluene	30	30.7	102	30	29.6	99	(80-121)	3.60	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		99	30		112	(81-118)	12.60	
4-Bromofluorobenzene (surr)	30		102	30		90	(85-114)	12.20	
Toluene-d8 (surr)	30		104	30		102	(89-112)	1.50	

Batch Information

Analytical Batch: **VMS21156**
 Analytical Method: **EPA 602/624**
 Instrument: **VPA 780/5975 GC/MS**
 Analyst: **MDT**

Prep Batch: **VXX37800**
 Prep Method: **SW5030B**
 Prep Date/Time: **09/09/2021 06:00**
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 10/11/2021 11:23:42AM

Billable Matrix Spike Summary

Original Sample ID: 1215582006
 MS Sample ID: 1215582007 BMS
 MSD Sample ID: 1215582008 BMSD

Analysis Date: 09/09/2021 13:14
 Analysis Date: 09/09/2021 17:24
 Analysis Date: 09/09/2021 17:39
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 602/624

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.200U	30.0	30.8	103	30.0	29.7	99	79-120	3.50	(< 20)
Ethylbenzene	0.500U	30.0	32.7	109	30.0	32.5	108	79-121	0.64	(< 20)
o-Xylene	0.500U	30.0	32.5	108	30.0	32.1	107	78-122	1.20	(< 20)
P & M -Xylene	1.00U	60.0	64.9	108	60.0	64.2	107	80-121	1.20	(< 20)
Toluene	0.790J	30.0	32.3	105	30.0	32.2	105	80-121	0.50	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.3	98	30.0	31.8	106	81-118	8.30	
4-Bromofluorobenzene (surr)		30.0	30.4	101	30.0	30.6	102	85-114	0.62	
Toluene-d8 (surr)		30.0	31.6	105	30.0	31.4	105	89-112	0.70	

Batch Information

Analytical Batch: VMS21156
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: MDT
 Analytical Date/Time: 9/9/2021 5:24:00PM

Prep Batch: VXX37800
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 9/9/2021 6:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Print Date: 10/11/2021 11:23:44AM

Method Blank

Blank ID: MB for HBN 1824913 [XXX/45485]
 Blank Lab ID: 1633497

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1215582001, 1215582002, 1215582003, 1215582004, 1215582005, 1215582006

Results by EPA 625M SIM (PAH) LV

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0205J	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	51.5	42-86		%
Fluoranthene-d10 (surr)	63.8	50-97		%

Batch Information

Analytical Batch: XMS12878
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: LAW
 Analytical Date/Time: 9/10/2021 2:30:00PM

Prep Batch: XXX45485
 Prep Method: SW3535A
 Prep Date/Time: 9/1/2021 1:30:44AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Print Date: 10/11/2021 11:23:45AM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1215582 [XXX45485]
 Blank Spike Lab ID: 1633498
 Date Analyzed: 09/10/2021 14:51

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1215582001, 1215582002, 1215582003, 1215582004, 1215582005, 1215582006

Results by EPA 625M SIM (PAH) LV

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Acenaphthene	2	1.25	62	(48-114)
Acenaphthylene	2	1.29	65	(35-121)
Anthracene	2	1.25	63	(53-119)
Benzo(a)Anthracene	2	1.29	65	(59-120)
Benzo[a]pyrene	2	1.23	61	(53-120)
Benzo[b]Fluoranthene	2	1.24	62	(53-126)
Benzo[g,h,i]perylene	2	1.28	64	(44-128)
Benzo[k]fluoranthene	2	1.28	64	(54-125)
Chrysene	2	1.28	64	(57-120)
Dibenzo[a,h]anthracene	2	1.27	64	(44-131)
Fluoranthene	2	1.24	62	(58-120)
Fluorene	2	1.27	64	(50-118)
Indeno[1,2,3-c,d] pyrene	2	1.26	63	(48-130)
Naphthalene	2	1.17	59	(43-114)
Phenanthrene	2	1.28	64	(53-115)
Pyrene	2	1.25	62	(53-121)

Surrogates

2-Methylnaphthalene-d10 (surr)	2		51	(42-86)
Fluoranthene-d10 (surr)	2		59	(50-97)

Batch Information

Analytical Batch: **XMS12878**
 Analytical Method: **EPA 625M SIM (PAH) LV**
 Instrument: **SVA Agilent 780/5975 GC/MS**
 Analyst: **LAW**

Prep Batch: **XXX45485**
 Prep Method: **SW3535A**
 Prep Date/Time: **09/01/2021 01:30**
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: Extract Vol:

Print Date: 10/11/2021 11:23:48AM

Billable Matrix Spike Summary

Original Sample ID: 1215582006
 MS Sample ID: 1215582007 BMS
 MSD Sample ID: 1215582008 BMSD

Analysis Date: 09/10/2021 19:45
 Analysis Date: 09/10/2021 20:06
 Analysis Date: 09/10/2021 20:26
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH) LV

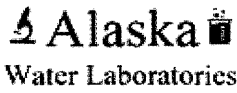
Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)							
		Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL		
Acenaphthene	0.0236U	1.92	.93	48	1.92	0.858	45	*	48-114	8.00	(< 20)	
Acenaphthylene	0.0236U	1.92	.968	50	1.92	0.919	48		35-121	5.20	(< 20)	
Anthracene	0.0236U	1.92	.812	42	*	1.92	0.738	38	*	53-119	9.40	(< 20)
Benzo(a)Anthracene	0.0236U	1.92	.767	40	*	1.92	0.708	37	*	59-120	8.00	(< 20)
Benzo[a]pyrene	0.00945U	1.92	.717	37	*	1.92	0.653	34	*	53-120	9.20	(< 20)
Benzo[b]Fluoranthene	0.0236U	1.92	.752	39	*	1.92	0.680	35	*	53-126	10.10	(< 20)
Benzo[g,h,i]perylene	0.0264J	1.92	.704	35	*	1.92	0.640	32	*	44-128	9.50	(< 20)
Benzo[k]fluoranthene	0.0236U	1.92	.713	37	*	1.92	0.667	35	*	54-125	6.60	(< 20)
Chrysene	0.0186J	1.92	.774	39	*	1.92	0.721	37	*	57-120	7.00	(< 20)
Dibenzo[a,h]anthracene	0.00945U	1.92	.702	37	*	1.92	0.640	33	*	44-131	9.20	(< 20)
Fluoranthene	0.0432J	1.92	.79	39	*	1.92	0.723	35	*	58-120	8.90	(< 20)
Fluorene	0.0236U	1.92	.894	47	*	1.92	0.828	43	*	50-118	7.70	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0236U	1.92	.686	36	*	1.92	0.615	32	*	48-130	10.80	(< 20)
Naphthalene	0.0471U	1.92	.981	51		1.92	0.906	47		43-114	7.90	(< 20)
Phenanthrene	0.0322J	1.92	.866	43	*	1.92	0.790	39	*	53-115	9.20	(< 20)
Pyrene	0.0455J	1.92	.797	39	*	1.92	0.733	36	*	53-121	8.50	(< 20)
Surrogates												
2-Methylnaphthalene-d10 (surr)		1.92	.844	44		1.92	0.702	37	*	42-86	18.40	
Fluoranthene-d10 (surr)		1.92	.718	37	*	1.92	0.670	35	*	50-97	7.00	

Batch Information

Analytical Batch: XMS12878
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: LAW
 Analytical Date/Time: 9/10/2021 8:06:00PM

Prep Batch: XXX45485
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 9/1/2021 1:30:44AM
 Prep Initial Wt./Vol.: 260.00mL
 Prep Extract Vol: 1.00mL

Print Date: 10/11/2021 11:23:49AM



281 N Main St., STE # 101
 Wasilla AK, 99654
 907-373-6130

1215582



FROM: Alaska Water Laboratories LLC.
 281 N. Main St, STE101
 Wasilla AK 99654

Sub-Contracted Lab: SGS Anchorage

Client Project Name: AWL-21-01541 **Certification Required:** Wastewater

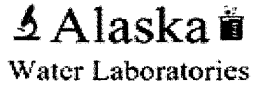
Requested Due Date (if not standard TAT): 9/21/2021

Samples

IAE
 2AE
 3AE
 4AE
 5AE
 ADDASAC
 9AE

AWL ID	Collection Date/ Time	Analysis	Comments	Matrix
AWL-21-01541-003	8/27/2021 10:30	624 TAH	VOA vials	WW
AWL-21-01541-003	8/27/2021 10:30	625 M PAH		WW
AWL-21-01541-005	8/27/2021 7:30	624 TAH	VOA vials	WW
AWL-21-01541-005	8/27/2021 7:30	625 M PAH		WW
AWL-21-01541-008	8/27/2021 8:15	624 TAH	VOA vials	WW
AWL-21-01541-008	8/27/2021 8:15	625 M PAH		WW
AWL-21-01541-011	8/27/2021 11:30	624 TAH	VOA vials	WW
AWL-21-01541-011	8/27/2021 11:30	625 M PAH		WW
AWL-21-01541-012	8/27/2021 11:35	624 TAH	VOA Vials; DUP VOL	WW
AWL-21-01541-012	8/27/2021 11:35	625 M PAH	DUP VOL	WW
AWL-21-01541-013	8/27/2021 11:40	624 TAH	VOA Vials; MS/MSD VOL	WW
AWL-21-01541-013	8/27/2021 11:40	625 M PAH	MS/MSD VOL	WW
AWL-21-01541-014	8/27/2021 7:30	624 TAH	VOA Vials; TRIP BLANKS	WW

Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
<i>[Signature]</i>	8-30-21 10:43			CoC Seal? Y / N
		<i>[Signature]</i>	8/30/21 14:11	Temp: D278.2 CoC Seal? Y / N



281 N Main St., STE # 101
 Wasilla AK, 99654
 907-373-6130

FROM: Alaska Water Laboratories LLC.
 281 N. Main St, STE101
 Wasilla AK 99654

Sub-Contracted Lab:

SGS-Anchorage

Client Project Name: AWL-21-01535

Certification Required: AK DW

Requested Due Date (if not standard TAT): Standard (No Rush)

Samples

AWL ID	Collection Date/ Time	Analysis	Comments	Matrix
AWL-21-01535-001	8/26/2021 15:05	350.1	Amonnia	WW

Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
<i>[Signature]</i>	<i>[Signature]</i> 8-26-21			CoC Seal? Y / N
Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
<i>[Signature]</i>	8-30-21 10:43			CoC Seal? Y / N



SGS Workorder #:

1215582

1215582

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		
Were Custody Seals intact? Note # & location	Yes	1F
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 3.2 °C Therm. ID: D27
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
*if >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		
Note: Refer to form F-083 "Sample Guide" for specific holding times.		
Were samples received within holding time?	Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	No	Samples do not match the COC. Went based on times. PM notified.
Note: If times differ <1hr, record details & login per COC. *Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
N/A ***Exemption permitted for metals (e.g, 200.8/6020B).		
Were proper containers (type/mass/volume/preservative***) used?	Yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		

Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1215582001-A	No Preservative Required	OK			
1215582001-B	No Preservative Required	OK			
1215582001-C	HCL to pH < 2	OK			
1215582001-D	HCL to pH < 2	OK			
1215582001-E	HCL to pH < 2	OK			
1215582002-A	No Preservative Required	OK			
1215582002-B	No Preservative Required	OK			
1215582002-C	HCL to pH < 2	OK			
1215582002-D	HCL to pH < 2	OK			
1215582002-E	HCL to pH < 2	OK			
1215582003-A	No Preservative Required	OK			
1215582003-B	No Preservative Required	OK			
1215582003-C	HCL to pH < 2	OK			
1215582003-D	HCL to pH < 2	OK			
1215582003-E	HCL to pH < 2	OK			
1215582004-A	No Preservative Required	OK			
1215582004-B	No Preservative Required	OK			
1215582004-C	HCL to pH < 2	OK			
1215582004-D	HCL to pH < 2	OK			
1215582004-E	HCL to pH < 2	OK			
1215582005-A	No Preservative Required	OK			
1215582005-B	No Preservative Required	OK			
1215582005-C	HCL to pH < 2	OK			
1215582005-D	HCL to pH < 2	OK			
1215582005-E	HCL to pH < 2	OK			
1215582006-A	No Preservative Required	OK			
1215582006-B	No Preservative Required	OK			
1215582006-C	HCL to pH < 2	OK			
1215582006-D	HCL to pH < 2	OK			
1215582007-A	No Preservative Required	OK			
1215582007-B	HCL to pH < 2	OK			
1215582007-C	HCL to pH < 2	OK			
1215582008-A	No Preservative Required	OK			
1215582008-B	HCL to pH < 2	OK			
1215582008-C	HCL to pH < 2	OK			
1215582009-A	HCL to pH < 2	OK			
1215582009-B	HCL to pH < 2	OK			
1215582009-C	HCL to pH < 2	OK			
1215582010-A	H2SO4 to pH < 2	OK			

Container Condition Glossary

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

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

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

DM - The container was received damaged.

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

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

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

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

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

QN - Insufficient sample quantity provided.

Client/Company Name & Address: HDR Inc. 2525 C St. Suite 500 Anchorage, AK 99503		Public Water System (PWS) ID:		Section To Be Completed by AWL									
		Project Name: MOA Stormwater Monitoring		Quote Number: _____		SDG: _____							
Contact Person: Cindy Helmericks Phone No: 907.644-2017 Fax No: --- E-mail: cindy.helmericks@hdrinc.com		Turnaround Time (TAT) for Results		Account: _____ Check _____ Credit _____									
		<input checked="" type="checkbox"/> Standard <input type="checkbox"/> days <small>Expected (prior authorization required for < 10 days) please specify due date below; additional charges may apply</small>		Invoice Contact Name & Address & Phone: HDR Inc. Calley Hall 2525 C St. Suite 500, Anchorage, AK 99503 907.644.2048									
Special Instructions/Requirements:		Requested Date for Results:		Results to STATE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Routine <input type="checkbox"/> Non-Routine							
Kit Preparation/Shipping Charge:		Requested Analysis/Method		PO/Contract No.: 10314109, Task 1									
Client Sample Identification (Name, Designation, Location, etc.)		Date Sampled	Time Sampled	Matrix	No. of Containers	5210B - BOD / TSS	EPA 200.8/2340B - Total Hardness	EPA 624 - TAH Preservative: HCl Lot#	EPA 625 SIM - TAqH	2540D - Total Suspended Solids	EPA 624 - TAH Preservative: HCl Lot#	200.8 - Dissolved Cu (Lab Filter)	Comments
1 SWM 03-01 001		8/27/21	9:50	WS	4	✓	✓	✓	✓	✓	✓	✓	Red
2 SWM 04-01 002		↓	9:55	WS	4	✓	✓	✓	✓	✓	✓	✓	Red
3 SWM 05-01 003		↓	10:30	WS	9	✓	✓	✓	✓	✓	✓	✓	Red
4 SWM 06-01 004		↓	8:55	WS	4	✓	✓	✓	✓	✓	✓	✓	Red
5 SWM 07-01 005		↓	7:30	WS	9	✓	✓	✓	✓	✓	✓	✓	Red
6 SWM 08-01 006		↓	7:45	WS	4	✓	✓	✓	✓	✓	✓	✓	Red
7 SWM 08-01 Dup 007		↓	7:50	WS	4	✓	✓	✓	✓	✓	✓	✓	Red
8 SWM 09-01 008		↓	8:15	WS	9	✓	✓	✓	✓	✓	✓	✓	Blue
9 SWM 10-01 009		↓	8:30	WS	4	✓	✓	✓	✓	✓	✓	✓	Blue
10 SWM 11-01 010		↓	9:25	WS	4	✓	✓	✓	✓	✓	✓	✓	Blue
Relinquished by: RC Kent		Date: 08/27/21	Time: 13:45	Received by: MJL		Date: 8-27-21	Time: 14:02	Section To Be Completed by AWL					
Relinquished by:		Date:	Time:	Received by:		Date:	Time:	Condition of Custody Seal: Intact Broken <i>Sealed</i>					
Relinquished by:		Date:	Time:	Received by:		Date:	Time:	Receiving location: <i>AWL</i> Temperature on arrival:					
Relinquished by:		Date:	Time:	Received by:		Date:	Time:	Thermometer ID # <i>IRT</i> Measurement method: Temp Blank Other					
Name of Sampler: (printed)		Shipping method/Tracking number: <i>Bubbles pH 22 all preserved samples</i>											



AWL Chain of Custody

Custody form MUST be signed
Please provide as much information as possible

Alaska Water Laboratories
281 N Main st, Suite # 101
Wasilla, AK 99654
907-373-6130

Sampling Event ID:

Client/Company Name & Address: HDR Inc. 2525 C St. Suite 500 Anchorage, AK 99503		Public Water System (PWS) ID:	
Contact Person: Cindy Heimericks Phone No: 907.644-2017 Fax No:		Project Name: MOA Stormwater Monitoring	
E-mail: cindy.heimericks@hdrinc.com		Quote Number: SDG:	
Special Instructions/Requirements:		Section To Be Completed by AWL	
Requested Date for Results:		Account:	
Results to STATE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Routine <input type="checkbox"/> Non-Routine		Invoice Contact Name & Address & Phone: HDR Inc. Calley Hall 2525 C St. Suite 500, Anchorage, AK 99503 907.644.2048	
Requested Analysis/Method 10314109, Task 1		Check	
PO/Contract No.:		Credit	

Kit Preparation/Shipping Charge:	Client Sample Identification (Name, Designation, Location, etc.)	Date Sampled	Time Sampled	Matrix	No. of Containers	Requested Analysis/Method						Comments	
						EPA 200.8/2340B - Total Hardness	EPA 624 - TAH Preservative: HCl	EPA 625 SIM - TAQH	2540D - Total Suspended Solids	EPA 624 - TAH Preservative: HCl	200.8 - Dissolved Cu (Lab Filter)		
SWM 12-01	011	8/27/21	11:30	WS	6	X	X	X	X	X	X	Fracks	
SWM 12-01 Dup	012		11:35	WS	9	X	X	X	X	X	X		Blue
SWM 12-01	013		11:40	WS	11	X	X	X	X	X	X		Blue
SWM TripBlank-01			11:30	WS	3								Blue MS/MSD
				WS									Trip Blanks (3)
				WS									
				WS									
				WS									
				WS									
				WS									

Relinquished by: KC Kent		Date	Time	Received by: [Signature]	Date	Time
Relinquished by:		Date	Time	Received by:	Date	Time
Relinquished by:		Date	Time	Received by:	Date	Time
Name of Sampler: (printed)		Section To Be Completed by AWL				
		Condition of Custody Seal: Intact		Broken		Absent
		Receiving location:		Temperature on arrival:		
		Thermometer ID #		Measurement method:		Temp Blank Other
		Shipping method/Tracking number:		D bubble		



Appendix C2
Laboratory Data Package
Storm Event #2



This page intentionally left blank.



281 N Main St., STE # 101
Wasilla AK, 99654
907-373-6130

Alaska Laboratory# AK01000

Client HDR Inc
Contact Cindy Helmericks

Project Name MOA Stormwater Monitoring
AWL # AWL-21-01587
PWS # None

Please direct any questions regarding the final report to Mary@AKWaterLabs.com or Matt@AKWaterLabs.com, or call 907-373-6130.

The results presented in this report meet the requirement of the laboratory's certifications and internal QC processes. Any exceptions will be noted in the case narratives attached. Reports with subcontracted laboratory data will be attached in full, with their quality control recoveries and case narrations.

The attached should contain analytical results for the analyses submitted on the client chain of custody. The information includes no opinions of the analysts or labs, data is represented after meeting certified testing requirements, and quality control measures.

Reproduction of the report in full requires the written approval of the laboratory.

Signature of Laboratory Management Date

Alaska Laboratory# AK01000

Client Project Name MOA Stormwater Monitoring AWL # AWL-21-01587
 Receipt Date and Time 9/2/21 15:00 Due Date 9/24/2021
 Cooler/Sample Temp (C) 5.93C, 5.13C Sampler Initials WN

Sample Receipt Comments Samples received by AKS on 9/2/2021 at 5.93C (3-8 cooler),5.13C (9-12 Cooler), on frozen ice.

Samples Received

Microbiological

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-02	AWL-21-01587-001	9/2/2021 11:00	9/2/21 15:34	Fecal Coliform	
SWM 04-02	AWL-21-01587-002	9/2/2021 11:05	9/2/21 15:34	Fecal Coliform	
SWM 05-02	AWL-21-01587-003	9/2/2021 12:05	9/2/21 15:34	Fecal Coliform	
SWM 06-02	AWL-21-01587-004	9/2/2021 10:00	9/2/21 15:34	Fecal Coliform	
SWM 07-02	AWL-21-01587-005	9/2/2021 12:30	9/2/21 15:34	Fecal Coliform	
SWM 08-02	AWL-21-01587-006	9/2/2021 8:50	9/2/21 15:34	Fecal Coliform	
SWM 08-02 DUP	AWL-21-01587-007	9/2/2021 8:55	9/2/21 15:34	Fecal Coliform	
SWM 09-02	AWL-21-01587-008	9/2/2021 12:55	9/2/21 16:00	Fecal Coliform	
SWM 10-02	AWL-21-01587-009	9/2/2021 9:35	9/2/21 16:00	Fecal Coliform	
SWM 11-02	AWL-21-01587-010	9/2/2021 10:30	9/2/21 16:00	Fecal Coliform	
SWM 12-02	AWL-21-01587-011	9/2/2021 11:25	9/2/21 16:00	Fecal Coliform	
SWM 12-02 DUP	AWL-21-01587-012	9/2/2021 11:30	9/2/21 16:00	Fecal Coliform	
SWM 12-02	AWL-21-01587-013	9/2/2021 11:35	9/2/21 16:00	Fecal Coliform	

Chemical

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-02	AWL-21-01587-001	9/2/2021 11:00	9/3/21 13:09	BOD	
SWM 03-02	AWL-21-01587-001	9/2/2021 11:00	9/8/21 15:31	TSS	
SWM 03-02	AWL-21-01587-001	9/2/2021 11:00	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 04-02	AWL-21-01587-002	9/2/2021 11:05	9/3/21 13:09	BOD	
SWM 04-02	AWL-21-01587-002	9/2/2021 11:05	9/8/21 15:31	TSS	
SWM 04-02	AWL-21-01587-002	9/2/2021 11:05	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 05-02	AWL-21-01587-003	9/2/2021 12:05	9/3/21 13:09	BOD	
SWM 05-02	AWL-21-01587-003	9/2/2021 12:05	9/8/21 15:31	TSS	
SWM 05-02	AWL-21-01587-003	9/2/2021 12:05	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 06-02	AWL-21-01587-004	9/2/2021 10:00	9/3/21 13:09	BOD	
SWM 06-02	AWL-21-01587-004	9/2/2021 10:00	9/8/21 15:31	TSS	
SWM 06-02	AWL-21-01587-004	9/2/2021 10:00	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 07-02	AWL-21-01587-005	9/2/2021 12:30	9/3/21 13:09	BOD	
SWM 07-02	AWL-21-01587-005	9/2/2021 12:30	9/3/21 16:22	TSS	
SWM 07-02	AWL-21-01587-005	9/2/2021 12:30	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 08-02	AWL-21-01587-006	9/2/2021 8:50	9/3/21 13:09	BOD	
SWM 08-02	AWL-21-01587-006	9/2/2021 8:50	9/3/21 16:22	TSS	
SWM 08-02	AWL-21-01587-006	9/2/2021 8:50	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 08-02 DUP	AWL-21-01587-007	9/2/2021 8:55	9/3/21 13:09	BOD	
SWM 08-02 DUP	AWL-21-01587-007	9/2/2021 8:55	9/3/21 16:22	TSS	
SWM 08-02 DUP	AWL-21-01587-007	9/2/2021 8:55	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 09-02	AWL-21-01587-008	9/2/2021 12:55	9/3/21 13:09	BOD	
SWM 09-02	AWL-21-01587-008	9/2/2021 12:55	9/3/21 16:22	TSS	
SWM 09-02	AWL-21-01587-008	9/2/2021 12:55	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 10-02	AWL-21-01587-009	9/2/2021 9:35	9/3/21 13:09	BOD	
SWM 10-02	AWL-21-01587-009	9/2/2021 9:35	9/3/21 16:22	TSS	
SWM 10-02	AWL-21-01587-009	9/2/2021 9:35	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 11-02	AWL-21-01587-010	9/2/2021 10:30	9/3/21 13:09	BOD	
SWM 11-02	AWL-21-01587-010	9/2/2021 10:30	9/8/21 15:31	TSS	
SWM 11-02	AWL-21-01587-010	9/2/2021 10:30	10/6/21 11:30	Hardness	Calc from Ca and Mg

SWM 12-02	AWL-21-01587-011	9/2/2021 11:25	9/3/21 13:09	BOD	
SWM 12-02	AWL-21-01587-011	9/2/2021 11:25	9/8/21 15:31	TSS	
SWM 12-02	AWL-21-01587-011	9/2/2021 11:25	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 12-02 DUP	AWL-21-01587-012	9/2/2021 11:30	9/3/21 13:09	BOD	
SWM 12-02 DUP	AWL-21-01587-012	9/2/2021 11:30	9/8/21 15:31	TSS	
SWM 12-02 DUP	AWL-21-01587-012	9/2/2021 11:30	10/6/21 11:30	Hardness	Calc from Ca and Mg
SWM 12-02	AWL-21-01587-013	9/2/2021 11:35	9/3/21 13:09	BOD	
SWM 12-02	AWL-21-01587-013	9/2/2021 11:35	9/8/21 15:31	TSS	
SWM 12-02	AWL-21-01587-013	9/2/2021 11:35		Hardness	MS/MSD in QC - can't report as parent target sample ID

Subcontracted

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-02	AWL-21-01587-001	9/2/2021 11:00	9/30/21 19:06	200.8 DISS	K2110627-013
SWM 03-02	AWL-21-01587-001	9/2/2021 11:00	10/4/21 11:42	200.7	K2110627-001
SWM 04-02	AWL-21-01587-002	9/2/2021 11:05	9/30/21 19:13	200.8 DISS	K2110627-014
SWM 04-02	AWL-21-01587-002	9/2/2021 11:05	10/4/21 12:28	200.7	K2110627-002
SWM 05-02	AWL-21-01587-003	9/2/2021 12:05	9/13/21 17:36	624	1215767001
SWM 05-02	AWL-21-01587-003	9/2/2021 12:05	9/15/21 18:16	625 SIM	1215767001
SWM 05-02	AWL-21-01587-003	9/2/2021 12:05	9/30/21 19:16	200.8 DISS	K2110627-015
SWM 05-02	AWL-21-01587-003	9/2/2021 12:05	10/4/21 12:30	200.7	K2110627-003
SWM 06-02	AWL-21-01587-004	9/2/2021 10:00	9/30/21 19:18	200.8 DISS	K2110627-016
SWM 06-02	AWL-21-01587-004	9/2/2021 10:00	10/4/21 12:33	200.7	K2110627-004
SWM 07-02	AWL-21-01587-005	9/2/2021 12:30	9/13/21 17:51	624	1215767002
SWM 07-02	AWL-21-01587-005	9/2/2021 12:30	9/15/21 18:36	625 SIM	1215767002
SWM 07-02	AWL-21-01587-005	9/2/2021 12:30	9/30/21 19:21	200.8 DISS	K2110627-017
SWM 07-02	AWL-21-01587-005	9/2/2021 12:30	10/4/21 12:02	200.7	K2110627-005
SWM 08-02	AWL-21-01587-006	9/2/2021 8:50	9/30/21 19:23	200.8 DISS	K2110627-018
SWM 08-02	AWL-21-01587-006	9/2/2021 8:50	10/4/21 12:36	200.7	K2110627-006
SWM 08-02 DUP	AWL-21-01587-007	9/2/2021 8:55	9/30/21 19:30	200.8 DISS	K2110627-019
SWM 08-02 DUP	AWL-21-01587-007	9/2/2021 8:55	10/4/21 12:55	200.7	K2110627-007
SWM 09-02	AWL-21-01587-008	9/2/2021 12:55	9/13/21 18:06	624	1215767003
SWM 09-02	AWL-21-01587-008	9/2/2021 12:55	9/15/21 18:57	625 SIM	1215767003
SWM 09-02	AWL-21-01587-008	9/2/2021 12:55	9/30/21 19:33	200.8 DISS	K2110627-020
SWM 09-02	AWL-21-01587-008	9/2/2021 12:55	10/4/21 12:57	200.7	K2110627-008
SWM 10-02	AWL-21-01587-009	9/2/2021 9:35	9/30/21 19:35	200.8 DISS	K2110627-021
SWM 10-02	AWL-21-01587-009	9/2/2021 9:35	10/4/21 13:00	200.7	K2110627-009
SWM 11-02	AWL-21-01587-010	9/2/2021 10:30	9/30/21 19:37	200.8 DISS	K2110627-022
SWM 11-02	AWL-21-01587-010	9/2/2021 10:30	10/4/21 13:03	200.7	K2110627-010
SWM 12-02	AWL-21-01587-011	9/2/2021 11:25	9/13/21 18:20	624	1215767004 - Parent Sample Billiable MS (1215767006) MSD (1215767007)
SWM 12-02	AWL-21-01587-011	9/2/2021 11:25	9/15/21 19:38	625 SIM	1215767004 - Parent Sample Billiable MS (1215767006) MSD (1215767007)
SWM 12-02	AWL-21-01587-011	9/2/2021 11:25	9/30/21 19:40	200.8 DISS	K2110627-023 Parent sample MS/MSD
SWM 12-02	AWL-21-01587-011	9/2/2021 11:25	10/4/21 13:05	200.7	K2110627-011 Parent sample MS/MSD
SWM 12-02 DUP	AWL-21-01587-012	9/2/2021 11:30	9/13/21 18:35	624	1215767005
SWM 12-02 DUP	AWL-21-01587-012	9/2/2021 11:30	9/15/21 19:18	625 SIM	1215767005
SWM 12-02 DUP	AWL-21-01587-012	9/2/2021 11:30	9/30/21 19:47	200.8 DISS	K2110627-024
SWM 12-02 DUP	AWL-21-01587-012	9/2/2021 11:30	10/4/21 13:13	200.7	K2110627-012
SWM TripBlank-01	AWL-21-01541-014	9/2/2021 11:25	9/13/21 15:24	624	1215767008 TRIP BLANK - TAH

Analytical Methods

Analyte	Method	Comments
Fecal Coliform	SM9222D MF	
BOD	SM5210B	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21
TSS	SM2540D	
Hardness	SM2340B	

200.7	200.7	Ca, Mg for Hardness Calculation
200.8	200.8	Dissolved, Cu
PAH	624	TAqH Calc - 1215767006, Billable MS; 1215767007 Billable MSD
TAqH	625 SIM	TAqH Calc - 1215767006, Billable MS; 1215767007 Billable MSD

Cert Required
CMDP # [REDACTED] WW

Log In Initials: MCC 9-7-21
DQO Initials: MJG 9-9-21

Comments: Rev1: TAH/PAH sample ID added to case narrative under subcontract notes. Parent samples ID'd. MCC 11/5/2021

Definitions:

DUP	Sample Duplicate
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MRL	Method Reporting Limit
MB	Method Blank
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
N/A	Not Applicable
TNTC	Count is Too Numerous To Count
<MDL	Result recovery is below the detectable laboratory limit, listed as the MDL

Data Qualifiers:

B	The result of both the method blank and the target sample are above the MDL.
D	Sample analysis accomplished through dilution.
J	The reported result is an estimated value above the LOD but below
U	Result is below the MDL, PQL, LOD, or LOQ
*	LCS/LCSD or Sample DUP fails all Duplicate criteria.
H	Holding time exceeded
E	Exceeds MCL

General Comments:

- 1.0) Basis: "As Received" = analyzed as received from client; "Dry" = dried prior to being analyzed; "Dry Weight Corrected" = analyzed as received; result corrected for percent moisture.

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:00
 PWS# None
 AWL # AWL-21-01587
 Sample SWM 03-02
 Location
 AWL ID/ Fraction AWL-21-01587-001 Matrix AQ
 AWL Batch ID: 090221-01-FC

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	2400	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 15:34	1 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:05
 PWS# None
 AWL Batch ID: 090221-01-FC
 AWL # AWL-21-01587
 Sample Location SWM 04-02
 AWL ID/ Fraction AWL-21-01587-002 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	818.18	CFU/100mL	9.091			9.09	SM9222D MF	AKS	9/2/21 15:34	1 and 10 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 12:05
 PWS# None
 AWL Batch ID: 090221-01-FC
 AWL # AWL-21-01587
 Sample Location SWM 05-02
 AWL ID/ Fraction AWL-21-01587-003 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1900	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 15:34	1 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 10:00
 PWS# None
 AWL # AWL-21-01587
 Sample Location SWM 06-02
 AWL ID/ Fraction AWL-21-01587-004 Matrix AQ
 AWL Batch ID: 090221-01-FC

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	36.36	CFU/100mL	9.091			9.09	SM9222D MF	AKS	9/2/21 15:34	1 and 10 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 12:30
 PWS# None
 AWL Batch ID: 090221-01-FC
 AWL # AWL-21-01587
 Sample Location SWM 07-02
 AWL ID/ Fraction AWL-21-01587-005 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	11200	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 15:34	1 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 8:50
 PWS# None
 AWL Batch ID: 090221-01-FC
 AWL # AWL-21-01587
 Sample SWM 08-02
 Location
 AWL ID/ Fraction AWL-21-01587-006 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1600	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 15:34	1 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 8:55
 PWS# None
 AWL Batch ID: 090221-01-FC
 AWL # AWL-21-01587
 Sample SWM 08-02 DUP
 Location
 AWL ID/ Fraction AWL-21-01587-007 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	2800	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 15:34	1 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 12:55
 PWS# None
 AWL Batch ID: 090221-02-FC

AWL # AWL-21-01587
 Sample Location SWM 09-02
 AWL ID/ Fraction AWL-21-01587-008 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	945.45	CFU/100mL	9.091			9.09	SM9222D MF	AKS	9/2/21 16:00	1 and 10 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 9:35
 PWS# None
 AWL Batch ID: 090221-02-FC
 AWL # AWL-21-01587
 Sample Location SWM 10-02
 AWL ID/ Fraction AWL-21-01587-009 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	45.45	CFU/100mL	9.09			9.09	SM9222D MF	AKS	9/2/21 16:00	1 and 10 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 10:30
 PWS# None
 AWL Batch ID: 090221-02-FC
 AWL # AWL-21-01587
 Sample Location SWM 11-02
 AWL ID/ Fraction AWL-21-01587-010 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	800	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 16:00	1 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:25
 PWS# None
 AWL # AWL-21-01587
 Sample SWM 12-02
 Location
 AWL ID/ Fraction AWL-21-01587-011 Matrix AQ
 AWL Batch ID: 090221-02-FC

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	12,700	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 16:00	1 used

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:30
 PWS# None
 AWL Batch ID: 090221-02-FC
 AWL # AWL-21-01587
 Sample Location SWM 12-02 DUP
 AWL ID/ Fraction AWL-21-01587-012 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	>20,000	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 16:00	1 used;TNTC

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:35
 PWS# None
 AWL Batch ID: 090221-02-FC
 AWL # AWL-21-01587
 Sample Location SWM 12-02
 AWL ID/ Fraction AWL-21-01587-013 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	>20,000	CFU/100mL	100			100	SM9222D MF	AKS	9/2/21 16:00	1 used;TNTC

Analyst Batching initials/date AKS 9-9-21
 Analyst reviewer initials/date JTR 9-13-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:00
 PWS# None

AWL # AWL-21-01587
 Sample SWM 03-02
 Location
 AWL ID/ Fraction AWL-21-01587-001 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	2.15	mg/L	1.5	0.45		B,D	1.5	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	24.14	mg/L	16.6822	7.50			1.50	SM2540D	JTR	9/8/21 15:31	090821-01-TSS
Comments											
Hardness	81.77	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 9-13-21(BOD), JTR 9-16-21 (TSS), MCC 10-6-21(Hardness)
JTR 9-15-21 (BOD), AKS 9-16-21(TSS), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:05
 PWS# None

AWL # AWL-21-01587
 Sample SWM 04-02
 Location
 AWL ID/ Fraction AWL-21-01587-002 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	1.82	mg/L	1.5	0.45		B,D	1.5	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	19.28	mg/L	16.0101	7.19			1.44	SM2540D	JTR	9/8/21 15:31	090821-01-TSS
Comments											
Hardness	89.15	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date AKS 9-13-21(BOD), JTR 9-16-21 (TSS), MCC 10-6-21(Hardness)
 Analyst reviewer initials/date JTR 9-15-21 (BOD), AKS 9-16-21(TSS), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 12:05
 PWS# None

AWL # AWL-21-01587
 Sample SWM 05-02
 Location
 AWL ID/ Fraction AWL-21-01587-003 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	11.33	mg/L	1.5	0.45		B,D	1.5	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	44.00	mg/L	27.8175	12.5			2.5	SM2540D	JTR	9/8/21 15:31	090821-01-TSS
Comments											
Hardness	27.92	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 9-13-21(BOD), JTR 9-16-21 (TSS), MCC 10-6-21(Hardness)
JTR 9-15-21 (BOD), AKS 9-16-21(TSS), AKS 10-7-21(Hardness)



Batch ID	102621-01-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-27-21
AWL ID	AWL-21-01587-003
Sample ID	SWM 05-02

Sampling Date	9/2/2021
----------------------	----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/2/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.00
<u>625 PAH</u>	<u>9/2/2021</u>
Acenaphthylene	<0.0232
Acenaphthene	<0.0232
Anthracene	<0.0232
Benzo(a)anthracene	<0.0232
Benzo(a)pyrene	<0.00925
Benzo(b)fluoranthene	<0.0232
Benzo(g,h,i)perylene	<0.0232
Benzo(k)fluoranthene	<0.0232
Chrysene	<0.0232
Dibenzo(a,h)anthracene	<0.00925
Fluoranthene	0.0168
Fluorene	<0.0232
Indeno(1,2,3-cd)pyrene	<0.0232
Naphthalene	<0.0463
Phenanthrene	0.0141
Pyrene	0.0161
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.047
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 10:00
 PWS# None

AWL # AWL-21-01587
 Sample SWM 06-02
 Location
 AWL ID/ Fraction AWL-21-01587-004 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	2.00	mg/L	1.5	0.45		B,D	1.5	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	<MDL	mg/L	16.0331	7.20		U	1.44	SM2540D	JTR	9/8/21 15:31	090821-01-TSS
Comments	Final results for TSS recovered under the MDL at 1.87 mg/L. JTR 9-16-21										
Hardness	60.85	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 9-13-21(BOD), JTR 9-16-21 (TSS), MCC 10-6-21(Hardness)
JTR 9-15-21 (BOD), AKS 9-16-21(TSS), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 12:30
 PWS# None

AWL # AWL-21-01587
 Sample SWM 07-02
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	5.54	mg/L	3	0.9		B,D	3	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	103.00	mg/L	55.635	25			5	SM2540D	JTR	9/3/21 16:22	090321-01-TSS
Comments											
Hardness	22.84	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-13-21(BOD), MCC 10-6-21 (Hardness)
 AKS 9-10-21(TSS), JTR 9-15-21 (BOD), AKS 10-7-21(Hardness)



Batch ID	102621-02-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-27-21
AWL ID	AWL-21-01587-005
Sample ID	SWM 07-02

Sampling Date	9/2/2021
---------------	----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/2/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>9/2/2021</u>
Acenaphthylene	<0.0236
Acenaphthene	<0.0236
Anthracene	<0.0236
Benzo(a)anthracene	<0.0236
Benzo(a)pyrene	<0.00945
Benzo(b)fluoranthene	0.0377
Benzo(g,h,i)perylene	0.058
Benzo(k)fluoranthene	<0.0236
Chrysene	0.0702
Dibenzo(a,h)anthracene	<0.00945
Fluoranthene	0.0722
Fluorene	<0.0236
Indeno(1,2,3-cd)pyrene	0.0189
Naphthalene	<0.0471
Phenanthrene	0.054
Pyrene	0.107
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.418
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 8:50
 PWS# None

AWL # AWL-21-01587
 Sample SWM 08-02
 Location
 AWL ID/ Fraction AWL-21-01587-006 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	1.27	mg/L	1.5	0.45		B,D,J	1.5	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	<MDL	mg/L	15.6939	7.05		U	1.41	SM2540D	JTR	9/3/21 16:22	090321-01-TSS
Comments	Final results for TSS recovered under the MDL at 5.08 mg/L. JTR 9-10-21										
Hardness	66.45	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-13-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-15-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 8:55
 PWS# None

AWL # AWL-21-01587
 Sample SWM 08-02 DUP
 Location
 AWL ID/ Fraction AWL-21-01587-007 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	1.24	mg/L	1	0.3		B,D	1	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	<MDL	mg/L	15.8957	7.14		U	1.43	SM2540D	JTR	9/3/21 16:22	090321-01-TSS
Comments	Final results for TSS recovered under the MDL at 4.71 mg/L. JTR 9-10-21										
Hardness	67.11	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-13-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-15-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 12:55
 PWS# None

AWL # AWL-21-01587
 Sample SWM 09-02
 Location
 AWL ID/ Fraction AWL-21-01587-008 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	1.66	mg/L	1.5	0.45		B,D	1.5	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	22.29	mg/L	15.8957	7.14			1.43	SM2540D	JTR	9/3/21 16:22	090321-01-TSS
Comments											
Hardness	8.33	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date JTR 9-10-21 (TSS), AKS 9-13-21(BOD), MCC 10-6-21 (Hardness)
 Analyst reviewer initials/date AKS 9-10-21(TSS), JTR 9-15-21 (BOD), AKS 10-7-21(Hardness)



Batch ID	102621-03-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-27-21
AWL ID	AWL-21-01587-008
Sample ID	SWM 09-02

Sampling Date	9/2/2021
---------------	----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/2/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>9/2/2021</u>
Acenaphthylene	<0.0236
Acenaphthene	<0.0236
Anthracene	<0.0236
Benzo(a)anthracene	<0.0236
Benzo(a)pyrene	<0.00945
Benzo(b)fluoranthene	<0.0236
Benzo(g,h,i)perylene	<0.0236
Benzo(k)fluoranthene	<0.0236
Chrysene	<0.0236
Dibenzo(a,h)anthracene	<0.00945
Fluoranthene	<0.0236
Fluorene	<0.0236
Indeno(1,2,3-cd)pyrene	<0.0236
Naphthalene	<0.0471
Phenanthrene	<0.0236
Pyrene	<0.0236
Total Aqueous Aromatic Hydrocarbons (TAqH)	<10
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 9:35
 PWS# None

AWL # AWL-21-01587
 Sample SWM 10-02
 Location
 AWL ID/ Fraction AWL-21-01587-009 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	0.80	mg/L	1.5	0.45		B,D,J	1.5	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	<MDL	mg/L	15.9641	7.17		U	1.43	SM2540D	JTR	9/3/21 16:22	090321-01-TSS
Comments	Final results for TSS recovered under the MDL at 6.60mg/L. JTR 9-10-21										
Hardness	130.60	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

JTR 9-10-21 (TSS), AKS 9-13-21(BOD), MCC 10-6-21 (Hardness)
AKS 9-10-21(TSS), JTR 9-15-21 (BOD), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 10:30
 PWS# None

AWL # AWL-21-01587
 Sample SWM 11-02
 Location
 AWL ID/ Fraction AWL-21-01587-010 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	6.05	mg/L	3	0.9		B,D	3	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	81.67	mg/L	37.09	16.6667			3.33	SM2540D	JTR	9/8/21 15:31	090821-01-TSS
Comments											
Hardness	27.51	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 9-13-21(BOD), JTR 9-16-21 (TSS), MCC 10-6-21(Hardness)
JTR 9-15-21 (BOD), AKS 9-16-21(TSS), AKS 10-7-21(Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:25
 PWS# None

AWL # AWL-21-01587
 Sample SWM 12-02
 Location
 AWL ID/ Fraction AWL-21-01587-011 Matrix AQ

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	7.28	mg/L	3	0.9		B,D	3	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	134.00	mg/L	55.635	25			5	SM2540D	JTR	9/8/21 15:31	090821-01-TSS
Comments											
Hardness	95.87	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date AKS 9-13-21(BOD), JTR 9-16-21 (TSS), MCC 10-6-21(Hardness)
 Analyst reviewer initials/date JTR 9-15-21 (BOD), AKS 9-16-21(TSS), AKS 10-7-21(Hardness)



Batch ID	102621-04-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-27-21
AWL ID	AWL-21-01587-011
Sample ID	SWM 12-02

Sampling Date	9/2/2021
---------------	----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/2/2021</u>
Benzene	<0.200
Toluene	3.06
Ethylbenzene	0.316
o-Xylene	0.702
m,p Xylene	1.66
<u>625 PAH</u>	<u>9/2/2021</u>
Acenaphthylene	<0.0240
Acenaphthene	<0.0240
Anthracene	<0.0240
Benzo(a)anthracene	<0.0240
Benzo(a)pyrene	<0.00960
Benzo(b)fluoranthene	0.404
Benzo(g,h,i)perylene	0.0577
Benzo(k)fluoranthene	<0.0240
Chrysene	0.0296
Dibenzo(a,h)anthracene	<0.00960
Fluoranthene	0.0725
Fluorene	<0.0240
Indeno(1,2,3-cd)pyrene	0.019
Naphthalene	<0.0481
Phenanthrene	0.0439
Pyrene	0.108
Total Aqueous Aromatic Hydrocarbons (TAqH)	6.473
Total Aromatic Hydrocarbons (TAH)	5.738

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:30
 PWS# None

AWL # AWL-21-01587
 Sample SWM 12-02 DUP
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	9.86	mg/L	3	0.9		B,D	3	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	189.00	mg/L	55.635	25			5	SM2540D	JTR	9/8/21 15:31	090821-01-TSS
Comments											
Hardness	89.59	mg/L	0.021	0.003			1	SM2340B	MCC	10/6/21 11:30	100621-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 9-13-21(BOD), JTR 9-16-21 (TSS), MCC 10-6-21(Hardness)
 JTR 9-15-21 (BOD), AKS 9-16-21(TSS), AKS 10-7-21(Hardness)



Batch ID	102621-05-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-27-21
AWL ID	AWL-21-01587-012
Sample ID	SWM 12-02 DUP

Sampling Date	9/2/2021
---------------	----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/2/2021</u>
Benzene	<0.200
Toluene	1.92
Ethylbenzene	<0.500
o-Xylene	0.435
m,p Xylene	1.01
<u>625 PAH</u>	<u>9/2/2021</u>
Acenaphthylene	<0.0240
Acenaphthene	<0.0240
Anthracene	<0.0240
Benzo(a)anthracene	<0.0240
Benzo(a)pyrene	<0.00960
Benzo(b)fluoranthene	0.0376
Benzo(g,h,i)perylene	0.0533
Benzo(k)fluoranthene	<0.0240
Chrysene	0.0243
Dibenzo(a,h)anthracene	<0.00960
Fluoranthene	0.0664
Fluorene	<0.0240
Indeno(1,2,3-cd)pyrene	0.0205
Naphthalene	<0.0481
Phenanthrene	0.0334
Pyrene	0.949
Total Aqueous Aromatic Hydrocarbons (TAqH)	4.550
Total Aromatic Hydrocarbons (TAH)	3.365

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 9/2/21 11:35
 PWS# None

AWL # AWL-21-01587
 Sample SWM 12-02
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	10.12	mg/L	3	0.9		B,D	3	SM5210B	AKS	9/3/21 13:09	090321-01-BOD
Comments	The Method Blank associated with this batch had a result greater than the 0.20 mg/L acceptable by SM5210B which may indicate organic or biological contamination. AKS 9-13-21										
TSS	207.00	mg/L	55.635	25			5	SM2540D	JTR	9/8/21 15:31	090821-01-TSS
Comments											

Analyst Batching initials/date AKS 9-13-21(BOD), JTR 9-16-21 (TSS)
 Analyst reviewer initials/date JTR 9-15-21 (BOD), AKS 9-16-21(TSS)

Alaska Laboratory# AK01000

Analysis QC Results

BOD SM 5210B

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
BOD	0.27	B	0.3	0.9		AKS	9/3/2021 13:09

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
BOD	193.95		198	97.95	85-115	AKS	9/3/2021 13:09

Sample Duplicate

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
BOD	212.36		213.66	0.61	≤20	AKS	9/3/2021 13:09

Total Suspended Solids SM2540D

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
TSS	-0.40		5	11.1		JTR	9/3/2021 16:22

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
TSS	75.33		77.4	97.33	90-110	JTR	9/3/2021 16:22

Sample Duplicate 1

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	2980.00		2980.00	0.00	≤20	JTR	9/3/2021 16:22

Sample Duplicate 2

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	105.50		103.00	2.40	≤20	JTR	9/3/2021 16:22

Total Suspended Solids SM2540D

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
TSS	-0.20		5	11.1		JTR	9/8/2021 15:31

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
TSS	76.00		77.4	98.19121	90-110	JTR	9/8/2021 15:31

Sample Duplicate 1

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	212.50		207.00	2.62	≤20	JTR	9/8/2021 15:31

Sample Duplicate 2

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	193.00		189.00	2.09	≤20	JTR	9/8/2021 15:31



October 05, 2021

Service Request No:K2110627

Mary Curry
Alaska Water Laboratories
281 N. Main Street, Suite #101
Wasilla, AK 99654

Laboratory Results for: AWL-21-01587

Dear Mary,

Enclosed are the results of the sample(s) submitted to our laboratory September 13, 2021
For your reference, these analyses have been assigned our service request number **K2110627**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Received: 09/13/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twenty four wastewater samples were received for analysis at ALS Environmental on 09/13/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy

Date 10/05/2021



SAMPLE DETECTION SUMMARY

CLIENT ID: AWL-21-01587-001-4 Lab ID: K2110627-001

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	22900		3	21	ug/L	200.7
Magnesium	5970		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-002-4 Lab ID: K2110627-002

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	25000		3	21	ug/L	200.7
Magnesium	6490		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-003-4 Lab ID: K2110627-003

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	8130		3	21	ug/L	200.7
Magnesium	1850		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-004-4 Lab ID: K2110627-004

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	16600		3	21	ug/L	200.7
Magnesium	4710		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-005-4 Lab ID: K2110627-005

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	5520		3	21	ug/L	200.7
Magnesium	2200		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-006-4 Lab ID: K2110627-006

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	19800		3	21	ug/L	200.7
Magnesium	4130		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-007-4 Lab ID: K2110627-007

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	20000		3	21	ug/L	200.7
Magnesium	4170		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-008-4 Lab ID: K2110627-008

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	2800		3	21	ug/L	200.7
Magnesium	325		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-009-4 Lab ID: K2110627-009

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	36700		3	21	ug/L	200.7
Magnesium	9460		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01587-010-4 Lab ID: K2110627-010

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	8050		3	21	ug/L	200.7

SAMPLE DETECTION SUMMARY

CLIENT ID: AWL-21-01587-009-3	Lab ID: K2110627-021
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
---------	---------	------	-----	-----	-------	--------

CLIENT ID: AWL-21-01587-010-3	Lab ID: K2110627-022
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	3.17		0.05	0.10	ug/L	200.8

CLIENT ID: AWL-21-01587-011-3/013-3	Lab ID: K2110627-023
--	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.45		0.05	0.10	ug/L	200.8

CLIENT ID: AWL-21-01587-012-3	Lab ID: K2110627-024
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.66		0.05	0.10	ug/L	200.8



Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Alaska Water Laboratories
Project: AWL-21-01587

Service Request:K2110627

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2110627-001	AWL-21-01587-001-4	9/2/2021	1100
K2110627-002	AWL-21-01587-002-4	9/2/2021	1105
K2110627-003	AWL-21-01587-003-4	9/2/2021	1205
K2110627-004	AWL-21-01587-004-4	9/2/2021	1000
K2110627-005	AWL-21-01587-005-4	9/2/2021	1230
K2110627-006	AWL-21-01587-006-4	9/2/2021	0850
K2110627-007	AWL-21-01587-007-4	9/2/2021	0855
K2110627-008	AWL-21-01587-008-4	9/2/2021	1255
K2110627-009	AWL-21-01587-009-4	9/2/2021	0935
K2110627-010	AWL-21-01587-010-4	9/2/2021	1030
K2110627-011	AWL-21-01587-011-4/-013-4-MS/-013-4-MSD	9/2/2021	1125
K2110627-012	AWL-21-01587-012-4	9/2/2021	1130
K2110627-013	AWL-21-01587-001-3	9/2/2021	1100
K2110627-014	AWL-21-01587-002-3	9/2/2021	1105
K2110627-015	AWL-21-01587-003-3	9/2/2021	1205
K2110627-016	AWL-21-01587-004-3	9/2/2021	1000
K2110627-017	AWL-21-01587-005-3	9/2/2021	1230
K2110627-018	AWL-21-01587-006-3	9/2/2021	0850
K2110627-019	AWL-21-01587-007-3	9/2/2021	0855
K2110627-020	AWL-21-01587-008-3	9/2/2021	1255
K2110627-021	AWL-21-01587-009-3	9/2/2021	0935
K2110627-022	AWL-21-01587-010-3	9/2/2021	1030
K2110627-023	AWL-21-01587-011-3/-013-3	9/2/2021	1125
K2110627-024	AWL-21-01587-012-3	9/2/2021	1130

K2110627



281 N Main St., STE # 101
Wasilla AK, 99654
907.373.6120

FROM: Alaska Water Laboratories LLC.
281 N. Main St, STE101
Wasilla AK 99654

ALS Environmental
Attn: Sample Receiving
1317 S. 13th Ave
Kelso, WA 98626
360-577-7222

Client Project Name: AWL-21-01587

Certification Required:

Requested Due Date (if not standard TAT): Standard

★ AK Wastewater Certs/PT's ; Report to MDL ; LINKOEDD;

Samples				
AWL ID	Collection Date/ Time	Analysis	Comments	Matrix
AWL-21-01587-001-4	9/2/2021 11:00	200.7	Ca & Mg	WW
AWL-21-01587-002-4	9/2/2021 11:05	200.7	Ca & Mg	WW
AWL-21-01587-003-4	9/2/2021 12:05	200.7	Ca & Mg	WW
AWL-21-01587-004-4	9/2/2021 10:00	200.7	Ca & Mg	WW
AWL-21-01587-005-4	9/2/2021 12:30	200.7	Ca & Mg	WW
AWL-21-01587-006-4	9/2/2021 8:50	200.7	Ca & Mg	WW
AWL-21-01587-007-4	9/2/2021 8:55	200.7	Ca & Mg	WW
AWL-21-01587-008-4	9/2/2021 12:55	200.7	Ca & Mg	WW
AWL-21-01587-009-4	9/2/2021 9:35	200.7	Ca & Mg	WW
AWL-21-01587-010-4	9/2/2021 10:30	200.7	Ca & Mg	WW
AWL-21-01587-011-4	9/2/2021 11:25	200.7	Ca & Mg Parent	WW
AWL-21-01587-012-4	9/2/2021 11:30	200.7	Ca & Mg Dup	WW
AWL-21-01587-013-4-MS	9/2/2021 11:35	200.7	Ca & Mg MS	WW
AWL-21-01587-013-4-MSD	9/2/2021 11:35	200.7	Ca & Mg MSD	WW
AWL-21-01587-001-3	9/2/2021 11:00	200.8	Diss Dissolved Cu	WW
AWL-21-01587-002-3	9/2/2021 11:05	200.8	Diss Dissolved Cu	WW
AWL-21-01587-003-3	9/2/2021 12:05	200.8	Diss Dissolved Cu	WW
AWL-21-01587-004-3	9/2/2021 10:00	200.8	Diss Dissolved Cu	WW
AWL-21-01587-005-3	9/2/2021 12:30	200.8	Diss Dissolved Cu	WW
AWL-21-01587-006-3	9/2/2021 8:50	200.8	Diss Dissolved Cu	WW
AWL-21-01587-007-3	9/2/2021 8:55	200.8	Diss Dissolved Cu	WW
AWL-21-01587-008-3	9/2/2021 12:55	200.8	Diss Dissolved Cu	WW
AWL-21-01587-009-3	9/2/2021 9:35	200.8	Diss Dissolved Cu	WW
AWL-21-01587-010-3	9/2/2021 10:30	200.8	Diss Dissolved Cu	WW
AWL-21-01587-011-3	9/2/2021 11:25	200.8	Diss Dissolved Cu Parent	WW
AWL-21-01587-012-3	9/2/2021 11:30	200.8	Diss Dissolved Cu Dup	WW
AWL-21-01587-013-3	9/2/2021 11:35	200.8	Diss Dissolved Cu MS	WW
AWL-21-01587-013-3	9/2/21 11:35	200.8	Diss Cu MSD	WW
Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
MCC	9-8-21 10:29	Amcc	9-13-21 1100	
Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
				CoC Seal? Y / N

→ Diss
Samples
filtered,
then
preserved
at AWL.
MCC

Cooler Receipt and Preservation Form

K2110627 PM KL

Client Alaska Waste Water

Service Request K2110626 9/13

Received: 9-13-21 Opened: 9-13-21 By: AL Unloaded: 9-13-21 By: AL

1. Samples were received via? **USPS** Fed Ex UPS DHL PDX Courier Hand Delivered
 2. Samples were received in: (circle) Cooler **Box** Envelope Other _____ NA
 3. Were custody seals on coolers? **NA** Y N If yes, how many and where? _____
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N
 4. Was a Temperature Blank present in cooler? **NA** Y N If yes, notate the temperature in the appropriate column below:
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
 5. Were samples received within the method specified temperature ranges? **NA** Y N
 If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. **NA** Y N
- If applicable, tissue samples were received: **Frozen Partially Thawed Thawed**

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified if out of temp	Tracking Number NA	Filed
						940610369930021815329	
						940610369930021815356	

6. Packing material: Inserts **Baggies** **Bubble Wrap** Gel Packs Wet Ice Dry Ice Sleeves _____
7. Were custody papers properly filled out (ink, signed, etc.)? NA **Y** N
8. Were samples received in good condition (unbroken) NA **Y** N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA **Y** N
10. Did all sample labels and tags agree with custody papers? NA **Y** N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA **Y** N
12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA **Y** N
13. Were VOA vials received without headspace? Indicate in the table below. **NA** Y N
14. Was C12/Res negative? **NA** Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____



Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
 - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01587/

Service Request: K2110627

Sample Name: AWL-21-01587-001-4
Lab Code: K2110627-001
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-002-4
Lab Code: K2110627-002
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-003-4
Lab Code: K2110627-003
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-004-4
Lab Code: K2110627-004
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-005-4
Lab Code: K2110627-005
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01587/

Service Request: K2110627

Sample Name: AWL-21-01587-006-4
Lab Code: K2110627-006
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-007-4
Lab Code: K2110627-007
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-008-4
Lab Code: K2110627-008
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-009-4
Lab Code: K2110627-009
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-010-4
Lab Code: K2110627-010
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01587/

Service Request: K2110627

Sample Name: AWL-21-01587-011-4/-013-4-MS/-013-4-
Lab Code: K2110627-011
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-012-4
Lab Code: K2110627-012
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01587-001-3
Lab Code: K2110627-013
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-002-3
Lab Code: K2110627-014
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-003-3
Lab Code: K2110627-015
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01587/

Service Request: K2110627

Sample Name: AWL-21-01587-004-3
Lab Code: K2110627-016
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-005-3
Lab Code: K2110627-017
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-006-3
Lab Code: K2110627-018
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-007-3
Lab Code: K2110627-019
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-008-3
Lab Code: K2110627-020
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01587/

Service Request: K2110627

Sample Name: AWL-21-01587-009-3
Lab Code: K2110627-021
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-010-3
Lab Code: K2110627-022
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-011-3/-013-3
Lab Code: K2110627-023
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE

Sample Name: AWL-21-01587-012-3
Lab Code: K2110627-024
Sample Matrix: Wastewater

Date Collected: 09/2/21
Date Received: 09/13/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
RMOORE



Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-001-4
Lab Code: K2110627-001

Service Request: K2110627
Date Collected: 09/02/21 11:00
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	22900	ug/L	21	3	1	10/04/21 11:42	09/17/21	
Magnesium	200.7	5970	ug/L	5.3	0.4	1	10/04/21 11:42	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-002-4
Lab Code: K2110627-002

Service Request: K2110627
Date Collected: 09/02/21 11:05
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	25000	ug/L	21	3	1	10/04/21 12:28	09/17/21	
Magnesium	200.7	6490	ug/L	5.3	0.4	1	10/04/21 12:28	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-003-4
Lab Code: K2110627-003

Service Request: K2110627
Date Collected: 09/02/21 12:05
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	8130	ug/L	21	3	1	10/04/21 12:30	09/17/21	
Magnesium	200.7	1850	ug/L	5.3	0.4	1	10/04/21 12:30	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-004-4
Lab Code: K2110627-004

Service Request: K2110627
Date Collected: 09/02/21 10:00
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	16600	ug/L	21	3	1	10/04/21 12:33	09/17/21	
Magnesium	200.7	4710	ug/L	5.3	0.4	1	10/04/21 12:33	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-005-4
Lab Code: K2110627-005

Service Request: K2110627
Date Collected: 09/02/21 12:30
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	5520	ug/L	21	3	1	10/04/21 12:02	09/17/21	
Magnesium	200.7	2200	ug/L	5.3	0.4	1	10/04/21 12:02	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-006-4
Lab Code: K2110627-006

Service Request: K2110627
Date Collected: 09/02/21 08:50
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	19800	ug/L	21	3	1	10/04/21 12:36	09/17/21	
Magnesium	200.7	4130	ug/L	5.3	0.4	1	10/04/21 12:36	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-007-4
Lab Code: K2110627-007

Service Request: K2110627
Date Collected: 09/02/21 08:55
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	20000	ug/L	21	3	1	10/04/21 12:55	09/17/21	
Magnesium	200.7	4170	ug/L	5.3	0.4	1	10/04/21 12:55	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-008-4
Lab Code: K2110627-008

Service Request: K2110627
Date Collected: 09/02/21 12:55
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	2800	ug/L	21	3	1	10/04/21 12:57	09/17/21	
Magnesium	200.7	325	ug/L	5.3	0.4	1	10/04/21 12:57	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-009-4
Lab Code: K2110627-009

Service Request: K2110627
Date Collected: 09/02/21 09:35
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	36700	ug/L	21	3	1	10/04/21 13:00	09/17/21	
Magnesium	200.7	9460	ug/L	5.3	0.4	1	10/04/21 13:00	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-010-4
Lab Code: K2110627-010

Service Request: K2110627
Date Collected: 09/02/21 10:30
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	8050	ug/L	21	3	1	10/04/21 13:03	09/17/21	
Magnesium	200.7	1800	ug/L	5.3	0.4	1	10/04/21 13:03	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21 11:25
Date Received: 09/13/21 11:00

Sample Name: AWL-21-01587-011-4/-013-4-MS/-013-4-MSD
Lab Code: K2110627-011

Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	27000	ug/L	21	3	1	10/04/21 13:05	09/17/21	
Magnesium	200.7	6910	ug/L	5.3	0.4	1	10/04/21 13:05	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-012-4
Lab Code: K2110627-012

Service Request: K2110627
Date Collected: 09/02/21 11:30
Date Received: 09/13/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	24600	ug/L	21	3	1	10/04/21 13:13	09/17/21	
Magnesium	200.7	6840	ug/L	5.3	0.4	1	10/04/21 13:13	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-001-3
Lab Code: K2110627-013

Service Request: K2110627
Date Collected: 09/02/21 11:00
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.88	ug/L	0.10	0.05	1	09/30/21 19:06	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-002-3
Lab Code: K2110627-014

Service Request: K2110627
Date Collected: 09/02/21 11:05
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.20	ug/L	0.10	0.05	1	09/30/21 19:13	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-003-3
Lab Code: K2110627-015

Service Request: K2110627
Date Collected: 09/02/21 12:05
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.42	ug/L	0.10	0.05	1	09/30/21 19:16	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-004-3
Lab Code: K2110627-016

Service Request: K2110627
Date Collected: 09/02/21 10:00
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.35	ug/L	0.10	0.05	1	09/30/21 19:18	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-005-3
Lab Code: K2110627-017

Service Request: K2110627
Date Collected: 09/02/21 12:30
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.43	ug/L	0.10	0.05	1	09/30/21 19:21	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-006-3
Lab Code: K2110627-018

Service Request: K2110627
Date Collected: 09/02/21 08:50
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	1.32	ug/L	0.10	0.05	1	09/30/21 19:23	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-007-3
Lab Code: K2110627-019

Service Request: K2110627
Date Collected: 09/02/21 08:55
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	1.22	ug/L	0.10	0.05	1	09/30/21 19:30	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-008-3
Lab Code: K2110627-020

Service Request: K2110627
Date Collected: 09/02/21 12:55
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.28	ug/L	0.10	0.05	1	09/30/21 19:33	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-009-3
Lab Code: K2110627-021

Service Request: K2110627
Date Collected: 09/02/21 09:35
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	0.55	ug/L	0.10	0.05	1	09/30/21 19:35	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-010-3
Lab Code: K2110627-022

Service Request: K2110627
Date Collected: 09/02/21 10:30
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	3.17	ug/L	0.10	0.05	1	09/30/21 19:37	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-011-3/-013-3
Lab Code: K2110627-023

Service Request: K2110627
Date Collected: 09/02/21 11:25
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.45	ug/L	0.10	0.05	1	09/30/21 19:40	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: AWL-21-01587-012-3
Lab Code: K2110627-024

Service Request: K2110627
Date Collected: 09/02/21 11:30
Date Received: 09/13/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.66	ug/L	0.10	0.05	1	09/30/21 19:47	09/17/21	



QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: Method Blank
Lab Code: KQ2118080-01

Service Request: K2110627
Date Collected: NA
Date Received: NA
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	2 J	ug/L	21	0.9	1	10/04/21 11:37	09/17/21	
Magnesium	200.7	0.7 J	ug/L	5.3	0.3	1	10/04/21 11:37	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater
Sample Name: Method Blank
Lab Code: KQ2118083-01

Service Request: K2110627
Date Collected: NA
Date Received: NA
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	ND U	ug/L	0.10	0.05	1	09/30/21 19:01	09/17/21	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21
Date Received: 09/13/21
Date Analyzed: 10/4/21
Date Extracted: 09/17/21

Matrix Spike Summary
Total Metals

Sample Name: AWL-21-01587-001-4
Lab Code: K2110627-001
Analysis Method: 200.7
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2118080-03

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	22900	33400	10000	105	70-130
Magnesium	5970	17100	10000	111	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21
Date Received: 09/13/21
Date Analyzed: 10/4/21
Date Extracted: 09/17/21

Matrix Spike Summary
Total Metals

Sample Name: AWL-21-01587-011-4/-013-4-MS/-013-4-MSD
Lab Code: K2110627-011
Analysis Method: 200.7
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2118080-05

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	27000	37300	10000	103	70-130
Magnesium	6910	18800	10000	119	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21
Date Received: 09/13/21
Date Analyzed: 09/30/21
Date Extracted: 09/17/21

Matrix Spike Summary
Dissolved Metals

Sample Name: AWL-21-01587-011-3/-013-3
Lab Code: K2110627-023
Analysis Method: 200.8
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2118083-03

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Copper	4.45	17.3	12.5	103	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21
Date Received: 09/13/21
Date Analyzed: 09/30/21
Date Extracted: 09/17/21

Matrix Spike Summary
Dissolved Metals

Sample Name: AWL-21-01587-001-3
Lab Code: K2110627-013
Analysis Method: 200.8
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2118083-05

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Copper	2.88	14.9	12.5	96	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21
Date Received: 09/13/21
Date Analyzed: 10/04/21

Replicate Sample Summary

Total Metals

Sample Name: AWL-21-01587-001-4
Lab Code: K2110627-001

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2118080-04 Result			
Calcium	200.7	21	0.9	22900	23100	23000	<1	20
Magnesium	200.7	5.3	0.3	5970	6030	6000	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21
Date Received: 09/13/21
Date Analyzed: 10/04/21

Replicate Sample Summary

Total Metals

Sample Name: AWL-21-01587-011-4/-013-4-MS/-013-4-MSD
Lab Code: K2110627-011

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2118080-06 Result			
Calcium	200.7	21	0.9	27000	26800	26900	<1	20
Magnesium	200.7	5.3	0.3	6910	6880	6900	<1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21
Date Received: 09/13/21
Date Analyzed: 09/30/21

Replicate Sample Summary

Dissolved Metals

Sample Name: AWL-21-01587-011-3/-013-3
Lab Code: K2110627-023

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2118083-04			
Copper	200.8	0.10	0.05	4.45	4.66	4.56	5	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Collected: 09/02/21
Date Received: 09/13/21
Date Analyzed: 09/30/21

Replicate Sample Summary
Dissolved Metals

Sample Name: AWL-21-01587-001-3
Lab Code: K2110627-013

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample KQ2118083-06 Result	Average	RPD	RPD Limit
Copper	200.8	0.10	0.05	2.88	2.99	2.94	4	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627
Date Analyzed: 10/04/21

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2118080-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Calcium	200.7	12700	12500	102	85-115
Magnesium	200.7	13700	12500	110	85-115

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01587
Sample Matrix: Wastewater

Service Request: K2110627

Date Analyzed: 09/30/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L

Basis:NA

Lab Control Sample

KQ2118083-02

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Copper	200.8	12.5	12.5	100	85-115

Laboratory Report of Analysis

To: Alaska Water Laboratories LLC.
281 N. Main Street Ste 101
Wasilla, AK 99654
907-373-6130

Report Number: **1215767**

Client Project: **AWL-21-01587**

Dear Mary Curry,

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 SGS at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

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

Sincerely,
SGS North America Inc.



Justin Nelson
2021.09.24
15:58:32 -08'00'

SGS Anchorage
Project Manager
ENV.ALASKA.PROJMAN@sgs.com

Date

Case Narrative

SGS Client: **Alaska Water Laboratories LLC.**

SGS Project: **1215767**

Project Name/Site: **AWL-21-01587**

Project Contact: **Mary Curry**

Refer to sample receipt form for information on sample condition.

AWL-21-01587-012 (1215767005) PS

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria. The sample was re-extracted outside of hold to confirm results. Results are comparable and in-hold data is reported.

AWL-21-01587...(1215767004BMS) (1215767006) BMS

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria.

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

AWL-21-0158...(1215767004BMSD) (1215767007) BMSD

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria.

8270D SIM - PAH BMSD recoveries for anthracene and fluoranthene do not meet QC criteria. Refer to the LCS for accuracy requirements.

8270D SIM - PAH BMS/BMSD RPDs for multiple analytes does not meet QC criteria. The results for these analytes are considered estimated in the parent sample.

1215767004MS (1635100) MS

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria.

8270D SIM - PAH MS recoveries for multiple analytes do not meet QC criteria due to sample matrix. Refer to the LCS for accuracy requirements.

1215767004MSD (1635101) MSD

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria.

8270D SIM - PAH MSD recoveries for anthracene and fluoranthene do not meet QC criteria. Refer to the LCS for accuracy requirements.

8270D SIM - PAH MS/MSD RPDs for multiple analytes does not meet QC criteria. The results for these analytes 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) LV				
1215767004	AWL-21-01587-011	XMS12892	Chrysene	SP
1215767005	AWL-21-01587-012	XMS12892	Chrysene	SP

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: 09/24/2021 1:21:58PM

Laboratory Qualifiers

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

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

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

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

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

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

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
AWL-21-01587-003	1215767001	09/02/2021	09/03/2021	Water (Surface, Eff., Ground)
AWL-21-01587-005	1215767002	09/02/2021	09/03/2021	Water (Surface, Eff., Ground)
AWL-21-01587-008	1215767003	09/02/2021	09/03/2021	Water (Surface, Eff., Ground)
AWL-21-01587-011	1215767004	09/02/2021	09/03/2021	Water (Surface, Eff., Ground)
AWL-21-01587-012	1215767005	09/02/2021	09/03/2021	Water (Surface, Eff., Ground)
AWL-21-01587...(1215767004BM	1215767006	09/02/2021	09/03/2021	Water (Surface, Eff., Ground)
AWL-21-0158...(1215767004BMS	1215767007	09/02/2021	09/03/2021	Water (Surface, Eff., Ground)
AWL-21-01587-014	1215767008	09/02/2021	09/03/2021	Water (Surface, Eff., Ground)

Method

EPA 602/624
EPA 625M SIM (PAH) LV

Method Description

602 Aromatics by 624 (W)
625 PAH SIM GC/MS Low Volume

Detectable Results Summary

Client Sample ID: **AWL-21-01587-003**

Lab Sample ID: 1215767001

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Fluoranthene	0.0168J	ug/L
Phenanthrene	0.0141J	ug/L
Pyrene	0.0161J	ug/L

Client Sample ID: **AWL-21-01587-005**

Lab Sample ID: 1215767002

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[b]Fluoranthene	0.0377J	ug/L
Benzo[g,h,i]perylene	0.0580	ug/L
Chrysene	0.0702	ug/L
Fluoranthene	0.0722	ug/L
Indeno[1,2,3-c,d] pyrene	0.0189J	ug/L
Phenanthrene	0.0540	ug/L
Pyrene	0.107	ug/L

Client Sample ID: **AWL-21-01587-011**

Lab Sample ID: 1215767004

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[b]Fluoranthene	0.0404J	ug/L
Benzo[g,h,i]perylene	0.0577	ug/L
Chrysene	0.0296J	ug/L
Fluoranthene	0.0725	ug/L
Indeno[1,2,3-c,d] pyrene	0.0190J	ug/L
Phenanthrene	0.0439J	ug/L
Pyrene	0.108	ug/L

Volatile GC/MS

Ethylbenzene	0.316J	ug/L
o-Xylene	0.702J	ug/L
P & M -Xylene	1.66J	ug/L
Toluene	3.06	ug/L

Client Sample ID: **AWL-21-01587-012**

Lab Sample ID: 1215767005

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[b]Fluoranthene	0.0376J	ug/L
Benzo[g,h,i]perylene	0.0533	ug/L
Chrysene	0.0243J	ug/L
Fluoranthene	0.0664	ug/L
Indeno[1,2,3-c,d] pyrene	0.0205J	ug/L
Phenanthrene	0.0334J	ug/L
Pyrene	0.0949	ug/L

Volatile GC/MS

o-Xylene	0.435J	ug/L
P & M -Xylene	1.01J	ug/L
Toluene	1.92	ug/L

Print Date: 09/24/2021 1:22:02PM



Results of AWL-21-01587-003

Client Sample ID: **AWL-21-01587-003**
 Client Project ID: **AWL-21-01587**
 Lab Sample ID: 1215767001
 Lab Project ID: 1215767

Collection Date: 09/02/21 12:05
 Received Date: 09/03/21 10:39
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Acenaphthene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Acenaphthylene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Benzo(a)Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Benzo[a]pyrene	0.00925 U	0.0185	0.00574	ug/L	1		09/15/21 18:16
Benzo[b]Fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Benzo[g,h,i]perylene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Benzo[k]fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Chrysene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Dibenzo[a,h]anthracene	0.00925 U	0.0185	0.00574	ug/L	1		09/15/21 18:16
Fluoranthene	0.0168 J	0.0463	0.0139	ug/L	1		09/15/21 18:16
Fluorene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Indeno[1,2,3-c,d] pyrene	0.0232 U	0.0463	0.0139	ug/L	1		09/15/21 18:16
Naphthalene	0.0463 U	0.0926	0.0287	ug/L	1		09/15/21 18:16
Phenanthrene	0.0141 J	0.0463	0.0139	ug/L	1		09/15/21 18:16
Pyrene	0.0161 J	0.0463	0.0139	ug/L	1		09/15/21 18:16
Surrogates							
2-Methylnaphthalene-d10 (surr)	44.6	42-86		%	1		09/15/21 18:16
Fluoranthene-d10 (surr)	55.9	50-97		%	1		09/15/21 18:16

Batch Information

Analytical Batch: XMS12892
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/15/21 18:16
 Container ID: 1215767001-D

Prep Batch: XXX45523
 Prep Method: SW3535A
 Prep Date/Time: 09/08/21 11:30
 Prep Initial Wt./Vol.: 270 mL
 Prep Extract Vol: 1 mL



Results of **AWL-21-01587-003**

Client Sample ID: **AWL-21-01587-003**
Client Project ID: **AWL-21-01587**
Lab Sample ID: 1215767001
Lab Project ID: 1215767

Collection Date: 09/02/21 12:05
Received Date: 09/03/21 10:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		09/13/21 17:36
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/21 17:36
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/13/21 17:36
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/13/21 17:36
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/21 17:36
Surrogates							
1,2-Dichloroethane-D4 (surr)	99.6	81-118		%	1		09/13/21 17:36
4-Bromofluorobenzene (surr)	101	85-114		%	1		09/13/21 17:36
Toluene-d8 (surr)	103	89-112		%	1		09/13/21 17:36

Batch Information

Analytical Batch: VMS21173
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 09/13/21 17:36
Container ID: 1215767001-A

Prep Batch: VXX37835
Prep Method: SW5030B
Prep Date/Time: 09/13/21 11:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of **AWL-21-01587-005**

Client Sample ID: **AWL-21-01587-005**
Client Project ID: **AWL-21-01587**
Lab Sample ID: 1215767002
Lab Project ID: 1215767

Collection Date: 09/02/21 12:30
Received Date: 09/03/21 10:39
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	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:36
Acenaphthylene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:36
Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:36
Benzo(a)Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:36
Benzo[a]pyrene	0.00945 U	0.0189	0.00585	ug/L	1		09/15/21 18:36
Benzo[b]Fluoranthene	0.0377 J	0.0472	0.0142	ug/L	1		09/15/21 18:36
Benzo[g,h,i]perylene	0.0580	0.0472	0.0142	ug/L	1		09/15/21 18:36
Benzo[k]fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:36
Chrysene	0.0702	0.0472	0.0142	ug/L	1		09/15/21 18:36
Dibenzo[a,h]anthracene	0.00945 U	0.0189	0.00585	ug/L	1		09/15/21 18:36
Fluoranthene	0.0722	0.0472	0.0142	ug/L	1		09/15/21 18:36
Fluorene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:36
Indeno[1,2,3-c,d] pyrene	0.0189 J	0.0472	0.0142	ug/L	1		09/15/21 18:36
Naphthalene	0.0471 U	0.0943	0.0292	ug/L	1		09/15/21 18:36
Phenanthrene	0.0540	0.0472	0.0142	ug/L	1		09/15/21 18:36
Pyrene	0.107	0.0472	0.0142	ug/L	1		09/15/21 18:36
Surrogates							
2-Methylnaphthalene-d10 (surr)	43.2	42-86		%	1		09/15/21 18:36
Fluoranthene-d10 (surr)	56	50-97		%	1		09/15/21 18:36

Batch Information

Analytical Batch: XMS12892
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: LAW
Analytical Date/Time: 09/15/21 18:36
Container ID: 1215767002-D

Prep Batch: XXX45523
Prep Method: SW3535A
Prep Date/Time: 09/08/21 11:30
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL



Results of **AWL-21-01587-005**

Client Sample ID: **AWL-21-01587-005**
Client Project ID: **AWL-21-01587**
Lab Sample ID: 1215767002
Lab Project ID: 1215767

Collection Date: 09/02/21 12:30
Received Date: 09/03/21 10:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		09/13/21 17:51
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/21 17:51
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/13/21 17:51
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/13/21 17:51
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/21 17:51
Surrogates							
1,2-Dichloroethane-D4 (surr)	99.3	81-118		%	1		09/13/21 17:51
4-Bromofluorobenzene (surr)	103	85-114		%	1		09/13/21 17:51
Toluene-d8 (surr)	102	89-112		%	1		09/13/21 17:51

Batch Information

Analytical Batch: VMS21173
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 09/13/21 17:51
Container ID: 1215767002-A

Prep Batch: VXX37835
Prep Method: SW5030B
Prep Date/Time: 09/13/21 11:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of **AWL-21-01587-008**

Client Sample ID: **AWL-21-01587-008**
Client Project ID: **AWL-21-01587**
Lab Sample ID: 1215767003
Lab Project ID: 1215767

Collection Date: 09/02/21 12:55
Received Date: 09/03/21 10:39
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	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Acenaphthylene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Benzo(a)Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Benzo[a]pyrene	0.00945 U	0.0189	0.00585	ug/L	1		09/15/21 18:57
Benzo[b]Fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Benzo[g,h,i]perylene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Benzo[k]fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Chrysene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Dibenzo[a,h]anthracene	0.00945 U	0.0189	0.00585	ug/L	1		09/15/21 18:57
Fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Fluorene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Indeno[1,2,3-c,d] pyrene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Naphthalene	0.0471 U	0.0943	0.0292	ug/L	1		09/15/21 18:57
Phenanthrene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Pyrene	0.0236 U	0.0472	0.0142	ug/L	1		09/15/21 18:57
Surrogates							
2-Methylnaphthalene-d10 (surr)	49	42-86		%	1		09/15/21 18:57
Fluoranthene-d10 (surr)	62.1	50-97		%	1		09/15/21 18:57

Batch Information

Analytical Batch: XMS12892
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: LAW
Analytical Date/Time: 09/15/21 18:57
Container ID: 1215767003-D

Prep Batch: XXX45523
Prep Method: SW3535A
Prep Date/Time: 09/08/21 11:30
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL



Results of **AWL-21-01587-008**

Client Sample ID: **AWL-21-01587-008**
Client Project ID: **AWL-21-01587**
Lab Sample ID: 1215767003
Lab Project ID: 1215767

Collection Date: 09/02/21 12:55
Received Date: 09/03/21 10:39
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		09/13/21 18:06
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/21 18:06
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/13/21 18:06
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/13/21 18:06
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/21 18:06
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		09/13/21 18:06
4-Bromofluorobenzene (surr)	100	85-114		%	1		09/13/21 18:06
Toluene-d8 (surr)	102	89-112		%	1		09/13/21 18:06

Batch Information

Analytical Batch: VMS21173
Analytical Method: EPA 602/624
Analyst: NRB
Analytical Date/Time: 09/13/21 18:06
Container ID: 1215767003-A

Prep Batch: VXX37835
Prep Method: SW5030B
Prep Date/Time: 09/13/21 11:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of AWL-21-01587-011

Client Sample ID: **AWL-21-01587-011**
 Client Project ID: **AWL-21-01587**
 Lab Sample ID: 1215767004
 Lab Project ID: 1215767

Collection Date: 09/02/21 11:25
 Received Date: 09/03/21 10:39
 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	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:38
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:38
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:38
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:38
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		09/15/21 19:38
Benzo[b]Fluoranthene	0.0404 J	0.0481	0.0144	ug/L	1		09/15/21 19:38
Benzo[g,h,i]perylene	0.0577	0.0481	0.0144	ug/L	1		09/15/21 19:38
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:38
Chrysene	0.0296 J	0.0481	0.0144	ug/L	1		09/15/21 19:38
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		09/15/21 19:38
Fluoranthene	0.0725	0.0481	0.0144	ug/L	1		09/15/21 19:38
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:38
Indeno[1,2,3-c,d] pyrene	0.0190 J	0.0481	0.0144	ug/L	1		09/15/21 19:38
Naphthalene	0.0481 U	0.0962	0.0298	ug/L	1		09/15/21 19:38
Phenanthrene	0.0439 J	0.0481	0.0144	ug/L	1		09/15/21 19:38
Pyrene	0.108	0.0481	0.0144	ug/L	1		09/15/21 19:38
Surrogates							
2-Methylnaphthalene-d10 (surr)	54	42-86		%	1		09/15/21 19:38
Fluoranthene-d10 (surr)	56.2	50-97		%	1		09/15/21 19:38

Batch Information

Analytical Batch: XMS12892
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/15/21 19:38
 Container ID: 1215767004-D

Prep Batch: XXX45523
 Prep Method: SW3535A
 Prep Date/Time: 09/08/21 11:30
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01587-011

Client Sample ID: **AWL-21-01587-011**
 Client Project ID: **AWL-21-01587**
 Lab Sample ID: 1215767004
 Lab Project ID: 1215767

Collection Date: 09/02/21 11:25
 Received Date: 09/03/21 10:39
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		09/13/21 18:20
Ethylbenzene	0.316 J	1.00	0.310	ug/L	1		09/13/21 18:20
o-Xylene	0.702 J	1.00	0.310	ug/L	1		09/13/21 18:20
P & M -Xylene	1.66 J	2.00	0.620	ug/L	1		09/13/21 18:20
Toluene	3.06	1.00	0.310	ug/L	1		09/13/21 18:20
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.6	81-118		%	1		09/13/21 18:20
4-Bromofluorobenzene (surr)	104	85-114		%	1		09/13/21 18:20
Toluene-d8 (surr)	103	89-112		%	1		09/13/21 18:20

Batch Information

Analytical Batch: VMS21173
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/13/21 18:20
 Container ID: 1215767004-A

Prep Batch: VXX37835
 Prep Method: SW5030B
 Prep Date/Time: 09/13/21 11:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of AWL-21-01587-012

Client Sample ID: **AWL-21-01587-012**
 Client Project ID: **AWL-21-01587**
 Lab Sample ID: 1215767005
 Lab Project ID: 1215767

Collection Date: 09/02/21 11:30
 Received Date: 09/03/21 10:39
 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	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:18
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:18
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:18
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:18
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		09/15/21 19:18
Benzo[b]Fluoranthene	0.0376 J	0.0481	0.0144	ug/L	1		09/15/21 19:18
Benzo[g,h,i]perylene	0.0533	0.0481	0.0144	ug/L	1		09/15/21 19:18
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:18
Chrysene	0.0243 J	0.0481	0.0144	ug/L	1		09/15/21 19:18
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		09/15/21 19:18
Fluoranthene	0.0664	0.0481	0.0144	ug/L	1		09/15/21 19:18
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		09/15/21 19:18
Indeno[1,2,3-c,d] pyrene	0.0205 J	0.0481	0.0144	ug/L	1		09/15/21 19:18
Naphthalene	0.0481 U	0.0962	0.0298	ug/L	1		09/15/21 19:18
Phenanthrene	0.0334 J	0.0481	0.0144	ug/L	1		09/15/21 19:18
Pyrene	0.0949	0.0481	0.0144	ug/L	1		09/15/21 19:18
Surrogates							
2-Methylnaphthalene-d10 (surr)	35.1	*	42-86	%	1		09/15/21 19:18
Fluoranthene-d10 (surr)	33.6	*	50-97	%	1		09/15/21 19:18

Batch Information

Analytical Batch: XMS12892
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 09/15/21 19:18
 Container ID: 1215767005-D

Prep Batch: XXX45523
 Prep Method: SW3535A
 Prep Date/Time: 09/08/21 11:30
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01587-012

Client Sample ID: **AWL-21-01587-012**
 Client Project ID: **AWL-21-01587**
 Lab Sample ID: 1215767005
 Lab Project ID: 1215767

Collection Date: 09/02/21 11:30
 Received Date: 09/03/21 10:39
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		09/13/21 18:35
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/21 18:35
o-Xylene	0.435 J	1.00	0.310	ug/L	1		09/13/21 18:35
P & M -Xylene	1.01 J	2.00	0.620	ug/L	1		09/13/21 18:35
Toluene	1.92	1.00	0.310	ug/L	1		09/13/21 18:35
Surrogates							
1,2-Dichloroethane-D4 (surr)	97.4	81-118		%	1		09/13/21 18:35
4-Bromofluorobenzene (surr)	103	85-114		%	1		09/13/21 18:35
Toluene-d8 (surr)	102	89-112		%	1		09/13/21 18:35

Batch Information

Analytical Batch: VMS21173
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/13/21 18:35
 Container ID: 1215767005-A

Prep Batch: VXX37835
 Prep Method: SW5030B
 Prep Date/Time: 09/13/21 11:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of AWL-21-01587-014

Client Sample ID: **AWL-21-01587-014**
 Client Project ID: **AWL-21-01587**
 Lab Sample ID: 1215767008
 Lab Project ID: 1215767

Collection Date: 09/02/21 11:25
 Received Date: 09/03/21 10:39
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		09/13/21 15:24
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		09/13/21 15:24
o-Xylene	0.500 U	1.00	0.310	ug/L	1		09/13/21 15:24
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		09/13/21 15:24
Toluene	0.500 U	1.00	0.310	ug/L	1		09/13/21 15:24
Surrogates							
1,2-Dichloroethane-D4 (surr)	105	81-118		%	1		09/13/21 15:24
4-Bromofluorobenzene (surr)	101	85-114		%	1		09/13/21 15:24
Toluene-d8 (surr)	103	89-112		%	1		09/13/21 15:24

Batch Information

Analytical Batch: VMS21173
 Analytical Method: EPA 602/624
 Analyst: NRB
 Analytical Date/Time: 09/13/21 15:24
 Container ID: 1215767008-A

Prep Batch: VXX37835
 Prep Method: SW5030B
 Prep Date/Time: 09/13/21 11:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1825511 [VXX/37835]
 Blank Lab ID: 1636286

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1215767001, 1215767002, 1215767003, 1215767004, 1215767005, 1215767008

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	105	81-118		%
4-Bromofluorobenzene (surr)	102	85-114		%
Toluene-d8 (surr)	103	89-112		%

Batch Information

Analytical Batch: VMS21173
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: NRB
 Analytical Date/Time: 9/13/2021 11:26:00AM

Prep Batch: VXX37835
 Prep Method: SW5030B
 Prep Date/Time: 9/13/2021 11:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Anti-Foam Blank

Blank ID: AFB for HBN 1825511 [VXX/37835]
 Blank Lab ID: 1636289

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1215767001, 1215767002, 1215767003, 1215767004, 1215767005, 1215767008

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L

Batch Information

Analytical Batch: VMS21173
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: NRB
 Analytical Date/Time: 9/13/2021 7:34:00PM

Prep Batch: VXX37835
 Prep Method: SW5030B
 Prep Date/Time: 9/13/2021 11:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Print Date: 09/24/2021 1:22:05PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1215767 [VXX37835]
 Blank Spike Lab ID: 1636287
 Date Analyzed: 09/13/2021 11:40

Spike Duplicate ID: LCSD for HBN 1215767 [VXX37835]
 Spike Duplicate Lab ID: 1636288
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1215767001, 1215767002, 1215767003, 1215767004, 1215767005, 1215767008

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	30	30.7	102	30	30.5	102	(79-120)	0.83	(< 20)
Ethylbenzene	30	31.9	106	30	31.9	106	(79-121)	0.17	(< 20)
o-Xylene	30	31.8	106	30	31.5	105	(78-122)	0.93	(< 20)
P & M -Xylene	60	64.0	107	60	63.2	105	(80-121)	1.20	(< 20)
Toluene	30	30.8	103	30	30.7	102	(80-121)	0.14	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		99	30		96	(81-118)	3.40	
4-Bromofluorobenzene (surr)	30		99	30		101	(85-114)	1.70	
Toluene-d8 (surr)	30		103	30		104	(89-112)	0.33	

Batch Information

Analytical Batch: VMS21173
 Analytical Method: EPA 602/624
 Instrument: VPA 780/5975 GC/MS
 Analyst: NRB

Prep Batch: VXX37835
 Prep Method: SW5030B
 Prep Date/Time: 09/13/2021 11:00
 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: 1215767004
MS Sample ID: 1215767006 BMS
MSD Sample ID: 1215767007 BMSD

Analysis Date: 09/13/2021 18:20
Analysis Date: 09/13/2021 13:41
Analysis Date: 09/13/2021 13:56
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 602/624

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.200U	30.0	30.9	103	30.0	30.0	100	79-120	2.90	(< 20)
Ethylbenzene	0.316J	30.0	32.8	108	30.0	33.9	112	79-121	3.30	(< 20)
o-Xylene	0.702J	30.0	32.3	105	30.0	35.8	117	78-122	10.40	(< 20)
P & M -Xylene	1.66J	60.0	66	107	60.0	68.6	112	80-121	3.90	(< 20)
Toluene	3.06	30.0	33.2	100	30.0	30.4	91	80-121	8.80	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	27.8	93	30.0	32.8	109	81-118	16.40	
4-Bromofluorobenzene (surr)		30.0	31	103	30.0	31.6	105	85-114	1.90	
Toluene-d8 (surr)		30.0	31.6	105	30.0	29.4	98	89-112	6.90	

Batch Information

Analytical Batch: VMS21173
Analytical Method: EPA 602/624
Instrument: VPA 780/5975 GC/MS
Analyst: NRB
Analytical Date/Time: 9/13/2021 1:41:00PM

Prep Batch: VXX37835
Prep Method: Volatiles Extraction 8240/8260 FULL
Prep Date/Time: 9/13/2021 11:00:00AM
Prep Initial Wt./Vol.: 5.00mL
Prep Extract Vol: 5.00mL

Print Date: 09/24/2021 1:22:10PM

Method Blank

Blank ID: MB for HBN 1825202 [XXX/45523]
 Blank Lab ID: 1634870

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1215767001, 1215767002, 1215767003, 1215767004, 1215767005

Results by EPA 625M SIM (PAH) LV

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	52.5	42-86		%
Fluoranthene-d10 (surr)	65	50-97		%

Batch Information

Analytical Batch: XMS12892
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 9/15/2021 3:11:00PM

Prep Batch: XXX45523
 Prep Method: SW3535A
 Prep Date/Time: 9/8/2021 11:30:13AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1215767 [XXX45523]

Blank Spike Lab ID: 1634871

Date Analyzed: 09/15/2021 15:32

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1215767001, 1215767002, 1215767003, 1215767004, 1215767005

Results by EPA 625M SIM (PAH) LV

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Acenaphthene	2	1.26	63	(48-114)
Acenaphthylene	2	1.29	64	(35-121)
Anthracene	2	1.29	64	(53-119)
Benzo(a)Anthracene	2	1.35	68	(59-120)
Benzo[a]pyrene	2	1.33	67	(53-120)
Benzo[b]Fluoranthene	2	1.43	71	(53-126)
Benzo[g,h,i]perylene	2	1.41	70	(44-128)
Benzo[k]fluoranthene	2	1.36	68	(54-125)
Chrysene	2	1.34	67	(57-120)
Dibenzo[a,h]anthracene	2	1.39	70	(44-131)
Fluoranthene	2	1.32	66	(58-120)
Fluorene	2	1.32	66	(50-118)
Indeno[1,2,3-c,d] pyrene	2	1.38	69	(48-130)
Naphthalene	2	1.19	59	(43-114)
Phenanthrene	2	1.40	70	(53-115)
Pyrene	2	1.33	66	(53-121)

Surrogates

2-Methylnaphthalene-d10 (surr)	2		52	(42-86)
Fluoranthene-d10 (surr)	2		62	(50-97)

Batch Information

Analytical Batch: XMS12892

Analytical Method: EPA 625M SIM (PAH) LV

Instrument: Agilent GC 7890B/5977A SWA

Analyst: LAW

Prep Batch: XXX45523

Prep Method: SW3535A

Prep Date/Time: 09/08/2021 11:30

Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Dupe Init Wt./Vol.: Extract Vol:



Billable Matrix Spike Summary

Original Sample ID: 1215767004
 MS Sample ID: 1215767006 BMS
 MSD Sample ID: 1215767007 BMSD

Analysis Date: 09/15/2021 19:38
 Analysis Date: 09/15/2021 19:58
 Analysis Date: 09/15/2021 20:19
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH) LV

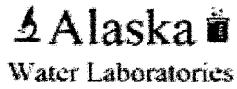
Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0240U	1.92	.259	14 *	1.89	0.919	49	48-114	112.00 *	(< 20)
Acenaphthylene	0.0240U	1.92	.276	14 *	1.89	0.965	51	35-121	111.00 *	(< 20)
Anthracene	0.0240U	1.92	.275	14 *	1.89	0.958	51 *	53-119	111.00 *	(< 20)
Benzo(a)Anthracene	0.0240U	1.92	.297	15 *	1.89	1.15	61	59-120	118.00 *	(< 20)
Benzo[a]pyrene	0.00960U	1.92	.28	15 *	1.89	1.14	60	53-120	121.00 *	(< 20)
Benzo[b]Fluoranthene	0.0404J	1.92	.303	14 *	1.89	1.23	63	53-126	121.00 *	(< 20)
Benzo[g,h,i]perylene	0.0577	1.92	.285	12 *	1.89	1.17	59	44-128	121.00 *	(< 20)
Benzo[k]fluoranthene	0.0240U	1.92	.287	15 *	1.89	1.19	63	54-125	122.00 *	(< 20)
Chrysene	0.0296J	1.92	.309	15 *	1.89	1.18	61	57-120	117.00 *	(< 20)
Dibenzo[a,h]anthracene	0.00960U	1.92	.26	14 *	1.89	1.09	58	44-131	123.00 *	(< 20)
Fluoranthene	0.0725	1.92	.309	12 *	1.89	1.09	54 *	58-120	112.00 *	(< 20)
Fluorene	0.0240U	1.92	.274	14 *	1.89	0.956	51	50-118	111.00 *	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0190J	1.92	.267	13 *	1.89	1.10	57	48-130	122.00 *	(< 20)
Naphthalene	0.0481U	1.92	.291	15 *	1.89	0.949	50	43-114	106.00 *	(< 20)
Phenanthrene	0.0439J	1.92	.296	13 *	1.89	1.05	54	53-115	112.00 *	(< 20)
Pyrene	0.108	1.92	.329	12 *	1.89	1.15	55	53-121	111.00 *	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.92	.206	11 *	1.89	0.735	39 *	42-86	112.00	
Fluoranthene-d10 (surr)		1.92	.267	14 *	1.89	0.915	49 *	50-97	110.00	

Batch Information

Analytical Batch: XMS12892
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 9/15/2021 7:58:00PM

Prep Batch: XXX45523
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 9/8/2021 11:30:13AM
 Prep Initial Wt./Vol.: 260.00mL
 Prep Extract Vol: 1.00mL

Print Date: 09/24/2021 1:22:15PM



281 N Main St., STE # 101
Wasilla AK, 99654
907-373-6130

PA# 369668 AD

1215767

FROM: Alaska Water Laboratories LLC.
281 N. Main St, STE101
Wasilla AK 99654

Sub-Contracted Lab: SGS Anchorage



Client Project Name: AWL-21-01587 **Certification Required:** Wastewater

Requested Due Date (if not standard TAT): 9/27/2021 **Comments:** Report to MDL, Provide EDD, PAH for TAqH Calcs

Samples

AWL ID	Collection Date/Time	Analysis	Comments	Matrix
<i>(1DC)</i> AWL-21-01587-003	9/2/2021 12:05	624 TAH	VOA vials	WW
<i>(1DE)</i> AWL-21-01587-003	9/2/2021 12:05	625 SIM PAH		WW
<i>(2DC)</i> AWL-21-01587-005	9/2/2021 12:30	624 TAH	VOA vials	WW
<i>(2DE)</i> AWL-21-01587-005	9/2/2021 12:30	625 SIM PAH		WW
<i>(3DC)</i> AWL-21-01587-008	9/2/2021 12:55	624 TAH	VOA vials	WW
<i>(3DE)</i> AWL-21-01587-008	9/2/2021 12:55	625 SIM PAH		WW
<i>(4DC)</i> AWL-21-01587-011	9/2/2021 11:25	624 TAH	VOA vials	WW
<i>(4DE)</i> AWL-21-01587-011	9/2/2021 11:25	625 SIM PAH		WW
<i>(5DC)</i> AWL-21-01587-012	9/2/2021 11:30	624 TAH	VOA Vials; DUP VOL	WW
<i>(5DE)</i> AWL-21-01587-012	9/2/2021 11:30	625 SIM PAH	DUP VOL	WW
<i>(6-7AC)</i> AWL-21-01587-013	9/2/2021 11:35	624 TAH	VOA Vials; MS/MSD VOL	WW
<i>(6-7DC)</i> AWL-21-01587-013	9/2/2021 11:35	625 SIM PAH	MS/MSD VOL	WW
<i>(8AC)</i> AWL-21-01587-014	9/2/2021 11:25	624 TAH	VOA Vials; TRIP BLANKS	WW

Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
<i>MCC</i>	<i>9-3-21 09:23</i>			
				CoC Seal? Y / N
		<i>MCC</i>	<i>9/3/21 1039</i>	
				Temp: <i>0.1 D23</i>
				CoC Seal? <i>(Y) / N</i> <i>IF, HD</i>



e-Sample Receipt Form

SGS Workorder #:

1215767



1 2 1 5 7 6 7

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		
Were Custody Seals intact? Note # & location	Yes	1F
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?	N/A	
N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: 1 @ 0.1 °C Therm. ID: D23
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
		Cooler ID: @ °C Therm. ID:
*if >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	N/A	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		
Note: Refer to form F-083 "Sample Guide" for specific holding times.		
Were samples received within holding time?	Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	Yes	
**Note: If times differ <1hr, record details & login per COC.		
***Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals)	Yes	
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A ***Exemption permitted for metals (e.g, 200.8/6020B).
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	Sample 5C was received broken. Proceeded with remaining vials.
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	No	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1215767001-A	HCL to pH < 2	OK			
1215767001-B	HCL to pH < 2	OK			
1215767001-C	HCL to pH < 2	OK			
1215767001-D	No Preservative Required	OK			
1215767001-E	No Preservative Required	OK			
1215767002-A	HCL to pH < 2	OK			
1215767002-B	HCL to pH < 2	OK			
1215767002-C	HCL to pH < 2	OK			
1215767002-D	No Preservative Required	OK			
1215767002-E	No Preservative Required	OK			
1215767003-A	HCL to pH < 2	OK			
1215767003-B	HCL to pH < 2	OK			
1215767003-C	HCL to pH < 2	OK			
1215767003-D	No Preservative Required	OK			
1215767003-E	No Preservative Required	OK			
1215767004-A	HCL to pH < 2	OK			
1215767004-B	HCL to pH < 2	OK			
1215767004-C	HCL to pH < 2	OK			
1215767004-D	No Preservative Required	OK			
1215767004-E	No Preservative Required	OK			
1215767005-A	HCL to pH < 2	OK			
1215767005-B	HCL to pH < 2	OK			
1215767005-C	HCL to pH < 2	OK			
1215767005-D	No Preservative Required	OK			
1215767005-E	No Preservative Required	OK			
1215767006-A	HCL to pH < 2	OK			
1215767006-B	HCL to pH < 2	OK			
1215767006-C	HCL to pH < 2	OK			
1215767006-D	No Preservative Required	OK			
1215767006-E	No Preservative Required	OK			
1215767007-A	HCL to pH < 2	OK			
1215767007-B	HCL to pH < 2	OK			
1215767007-C	HCL to pH < 2	OK			
1215767007-D	No Preservative Required	OK			
1215767007-E	No Preservative Required	OK			
1215767008-A	HCL to pH < 2	OK			
1215767008-B	HCL to pH < 2	OK			
1215767008-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 that an inappropriate container was submitted.

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

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

DM - The container was received damaged.

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

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

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

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

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

QN - Insufficient sample quantity provided.



Alaska Water Laboratories
281 N Main St, Suite # 101
Wasilla, AK 99654
907-373-6130

AWL Chain of Custody
Custody form **MUST** be signed
Please provide as much information as possible



AWL-21- 01587

Client/Company Name & Address: HDR Inc. 2525 C St. Suite 500 Anchorage, AK 99503		Public Water System (PWS) ID: Project Name: MOA Stormwater Monitoring		Section To Be Completed by AWL Quote Number: _____ SDG: _____ Account: _____ Check _____ Credit _____																																																																																																																																																																		
Contact Person: Cindy Helmericks Phone No: 907.644-2017 Fax No: --- E-mail: cindy.helmericks@hdrinc.com		Turnaround Time (TAT) for Results <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited (prior authorization required) _____ days please specify due date below; additional charges may apply		Invoice Contact Name & Address & Phone: HDR Inc. Calley Hall 2525 C St. Suite 500, Anchorage, AK 99503 907.644.2048																																																																																																																																																																		
Requested Date for Results: Results to STATE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Routine <input type="checkbox"/> Non-Routine		PO/Contract No.: 10314109, Task 1		Requested Analysis/Method																																																																																																																																																																		
Special Instructions/Requirements:		<table border="1"> <thead> <tr> <th rowspan="2">Kit Preparation/Shipping Charge:</th> <th rowspan="2">Client Sample Identification (Name, Designation, Location, etc.)</th> <th rowspan="2">Date Sampled</th> <th rowspan="2">Time Sampled</th> <th rowspan="2">Matrix</th> <th rowspan="2">No. of Containers</th> <th colspan="6">Requested Analysis/Method</th> <th rowspan="2">Comments</th> </tr> <tr> <th>5210B - BOD</th> <th>2540D - Total Suspended Solids</th> <th>9222D - Fecal Coliform Preserv.: Na2SO4</th> <th>200.8 - Dissolved Cu (Lab Filter)</th> <th>EPA 200.8/2340B - Total Hardness HNO3</th> <th>EPA 625 SIM - TAqH</th> <th>EPA 624 - TAH Preservative: HCl</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>SWM 03-02 001</td> <td>9/2/21</td> <td>11:00</td> <td>WS</td> <td>4</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td>SWM 04-02 002</td> <td></td> <td>11:05</td> <td>WS</td> <td>4</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>SWM 05-02 003</td> <td></td> <td>12:05</td> <td>WS</td> <td>6</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>4</td> <td>SWM 06-02 004</td> <td></td> <td>10:00</td> <td>WS</td> <td>4</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>SWM 07-02 005</td> <td></td> <td>12:30</td> <td>WS</td> <td>6</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>SWM 08-02 006</td> <td></td> <td>8:50</td> <td>WS</td> <td>4</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>7</td> <td>SWM 08-02 Dup 007</td> <td></td> <td>8:55</td> <td>WS</td> <td>4</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>8</td> <td>SWM 09-02 008</td> <td></td> <td>12:55</td> <td>WS</td> <td>9</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>9</td> <td>SWM 10-02 009</td> <td></td> <td>9:35</td> <td>WS</td> <td>4</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>10</td> <td>SWM 11-02 010</td> <td></td> <td>10:30</td> <td>WS</td> <td>4</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> </tr> </tbody> </table>				Kit Preparation/Shipping Charge:	Client Sample Identification (Name, Designation, Location, etc.)	Date Sampled	Time Sampled	Matrix	No. of Containers	Requested Analysis/Method						Comments	5210B - BOD	2540D - Total Suspended Solids	9222D - Fecal Coliform Preserv.: Na2SO4	200.8 - Dissolved Cu (Lab Filter)	EPA 200.8/2340B - Total Hardness HNO3	EPA 625 SIM - TAqH	EPA 624 - TAH Preservative: HCl		1	SWM 03-02 001	9/2/21	11:00	WS	4	X	X	X	X	X	X			2	SWM 04-02 002		11:05	WS	4	X	X	X	X	X	X			3	SWM 05-02 003		12:05	WS	6	X	X	X	X	X	X			4	SWM 06-02 004		10:00	WS	4	X	X	X	X	X	X			5	SWM 07-02 005		12:30	WS	6	X	X	X	X	X	X			6	SWM 08-02 006		8:50	WS	4	X	X	X	X	X	X			7	SWM 08-02 Dup 007		8:55	WS	4	X	X	X	X	X	X			8	SWM 09-02 008		12:55	WS	9	X	X	X	X	X	X			9	SWM 10-02 009		9:35	WS	4	X	X	X	X	X	X			10	SWM 11-02 010		10:30	WS	4	X	X	X	X	X	X		
Kit Preparation/Shipping Charge:	Client Sample Identification (Name, Designation, Location, etc.)	Date Sampled	Time Sampled	Matrix	No. of Containers							Requested Analysis/Method							Comments																																																																																																																																																			
						5210B - BOD	2540D - Total Suspended Solids	9222D - Fecal Coliform Preserv.: Na2SO4	200.8 - Dissolved Cu (Lab Filter)	EPA 200.8/2340B - Total Hardness HNO3	EPA 625 SIM - TAqH	EPA 624 - TAH Preservative: HCl																																																																																																																																																										
1	SWM 03-02 001	9/2/21	11:00	WS	4	X	X	X	X	X	X																																																																																																																																																											
2	SWM 04-02 002		11:05	WS	4	X	X	X	X	X	X																																																																																																																																																											
3	SWM 05-02 003		12:05	WS	6	X	X	X	X	X	X																																																																																																																																																											
4	SWM 06-02 004		10:00	WS	4	X	X	X	X	X	X																																																																																																																																																											
5	SWM 07-02 005		12:30	WS	6	X	X	X	X	X	X																																																																																																																																																											
6	SWM 08-02 006		8:50	WS	4	X	X	X	X	X	X																																																																																																																																																											
7	SWM 08-02 Dup 007		8:55	WS	4	X	X	X	X	X	X																																																																																																																																																											
8	SWM 09-02 008		12:55	WS	9	X	X	X	X	X	X																																																																																																																																																											
9	SWM 10-02 009		9:35	WS	4	X	X	X	X	X	X																																																																																																																																																											
10	SWM 11-02 010		10:30	WS	4	X	X	X	X	X	X																																																																																																																																																											
Relinquished by: _____ Date: 9/2/21 Time: 2:59PM		Received by: AWL Date: 9-2-21 Time: 15:00		Section To Be Completed by AWL Condition of Custody Seal: Intact _____ Broken _____ Receiving location: _____ Temperature on arrival: _____ °C _____ °C																																																																																																																																																																		
Relinquished by: _____ Date: _____ Time: _____		Received by: _____ Date: _____ Time: _____		Thermometer ID # 187 Measurement method: _____ Shipping method/Tracking number: _____																																																																																																																																																																		
Relinquished by: _____ Date: _____ Time: _____		Received by: _____ Date: _____ Time: _____		Other: _____																																																																																																																																																																		
Name of Sampler: (printed) Will Nejar																																																																																																																																																																						



AWL Chain of Custody

Alaska Water Laboratories
281 N Main St, Suite # 101
Wasilla, AK 99654
907-373-6130

Custody form **MUST** be signed
Please provide as much information as possible

Sampling Event ID:

Client/Company Name & Address: HDR Inc. 2525 C St. Suite 500 Anchorage, AK 99503		Public Water System (PWS) ID: Project Name: MOA Stormwater Monitoring		Section To Be Completed by AWL Quote Number: _____ Account: _____ Check: _____ Credit: _____	
Contact Person: Cindy Helmericks Phone No.: 907.644-2017 Fax No.: --- E-mail: cindy.helmericks@hdrinc.com		Invoice Contact Name & Address & Phone: HDR Inc. Calley Hall 2525 C St. Suite 500, Anchorage, AK 99503 907.644.2048		Requested Analysis/Method PO/Contract No.: 10314109, Task 1	
Special Instructions/Requirements: Storm 2 SWM, 9, 12, 14		Turnaround Time (TAT) for Results <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited (prior authorization required)		Requested Analysis/Method EPA 200.8/2340B - Total Hardness: HNO3 EPA 625 SIM - TAqH EPA 624 - TAH Preservative: HCl EPA 200.8/2340B - Total Hardness: HNO3 EPA 625 SIM - TAqH EPA 624 - TAH Preservative: HCl	
Kit Preparation/Shipping Charge: Client Sample Identification (Name, Designation, Location, etc.)		Requested Date for Results: Results to STATE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Routine <input type="checkbox"/> Non-Routine		Requested Analysis/Method EPA 200.8/2340B - Total Hardness: HNO3 EPA 625 SIM - TAqH EPA 624 - TAH Preservative: HCl EPA 200.8/2340B - Total Hardness: HNO3 EPA 625 SIM - TAqH EPA 624 - TAH Preservative: HCl	
SWM 12-02 011 SWM 12-02 Dup 012 SWM 12-02 013 SWM TripBlank-02 014 SWM TripBlank-02 015 SWM TripBlank-02 016 SWM TripBlank-02 017 SWM TripBlank-02 018 SWM TripBlank-02 019 SWM TripBlank-02 020		9/2/21 11:25 11:30 11:35 11:25		9 9 16 3	
1/3 = No bubbles 1/3 bubble = Lemm 1/3 bubble = Lemm		WS WS WS WS WS WS WS WS WS		X X X X X X X X X X	
Relinquished by: [Signature]		Date: 9/2/21 Time: 2:59 PM		Received by: AWS	
Relinquished by:		Date:		Received by:	
Relinquished by:		Date:		Received by:	
Name of Sampler: (printed) Will Najjar		Date:		Received by:	

Condition of Custody Seal: Intact
Receiving location: AWL
Temperature on arrival: 9-12 5.13C
Measurement method: Trip Blank
Shipping method/Tracking number: 1RT



Appendix C3
Laboratory Data Package
Storm Event #3



This page intentionally left blank.



281 N Main St., STE # 101
Wasilla AK, 99654
907-373-6130

Alaska Laboratory# AK01000

Client HDR Inc
Contact Cindy Helmericks

Project Name MOA Stormwater Monitoring
AWL # AWL-21-01786
PWS # None

Please direct any questions regarding the final report to Mary@AKWaterLabs.com or Matt@AKWaterLabs.com, or call 907-373-6130.

The results presented in this report meet the requirement of the laboratory's certifications and internal QC processes. Any exceptions will be noted in the case narratives attached. Reports with subcontracted laboratory data will be attached in full, with their quality control recoveries and case narrations.

The attached should contain analytical results for the analyses submitted on the client chain of custody. The information includes no opinions of the analysts or labs, data is represented after meeting certified testing requirements, and quality control measures.

Reproduction of the report in full requires the written approval of the laboratory.

Signature of Laboratory Management Date

Alaska Laboratory# AK01000

Client Project Name MOA Stormwater Monitoring AWL # AWL-21-01786
 Receipt Date and Time 9/24/21 13:09 Due Date 10/8/2021
 Cooler/Sample Temp (C) 1.63, 1.63 & 1.33 Sampler Initials KG
 Sample Receipt Comments Received by MJG 9-24-21, #IRT samples (03-08 1.63C), (09-12 1.63C), (5, 7, 9, 12 1.33C), all on frozen ice, pH <2 for all preserved metals samples. No Bubbles in vials.

Samples Received

Microbiological

Sample Location	AWL ID	Collection Date/Time	Analysis Date/Time	Analysis	Notes
SWM 03-03	AWL-21-01786-001	9/24/2021 9:45	9/24/21 13:49	Fecal Coliform	
SWM 04-03	AWL-21-01786-002	9/24/2021 9:55	9/24/21 13:49	Fecal Coliform	
SWM 05-03	AWL-21-01786-003	9/24/2021 10:50	9/24/21 13:49	Fecal Coliform	
SWM 06-03	AWL-21-01786-004	9/24/2021 8:35	9/24/21 13:49	Fecal Coliform	
SWM 07-03	AWL-21-01786-005	9/24/2021 7:05	9/24/21 13:49	Fecal Coliform	
SWM 08-03	AWL-21-01786-006	9/24/2021 7:15	9/24/21 13:49	Fecal Coliform	
SWM 08-03 DUP	AWL-21-01786-007	9/24/2021 7:20	9/24/21 13:49	Fecal Coliform	
SWM 09-03	AWL-21-01786-008	9/24/2021 7:55	9/24/21 14:15	Fecal Coliform	
SWM 10-03	AWL-21-01786-009	9/24/2021 8:15	9/24/21 14:15	Fecal Coliform	
SWM 11-03	AWL-21-01786-010	9/24/2021 9:10	9/24/21 14:15	Fecal Coliform	
SWM 12-03	AWL-21-01786-011	9/24/2021 10:10	9/24/21 14:15	Fecal Coliform	
SWM 12-03 DUP	AWL-21-01786-012	9/24/2021 10:15	9/24/21 14:15	Fecal Coliform	
SWM 12-03	AWL-21-01786-013	9/24/2021 10:20	9/24/21 14:15	Fecal Coliform	

Chemical

Sample Location	AWL ID	Collection Date/Time	Analysis Date/Time	Analysis	Notes
SWM 03-03	AWL-21-01786-001	9/24/2021 9:45	9/24/21 15:19	BOD	
SWM 03-03	AWL-21-01786-001	9/24/2021 9:45	9/28/21 13:31	TSS	
SWM 03-03	AWL-21-01786-001	9/24/2021 9:45	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 04-03	AWL-21-01786-002	9/24/2021 9:55	9/24/21 15:19	BOD	
SWM 04-03	AWL-21-01786-002	9/24/2021 9:55	9/28/21 13:31	TSS	
SWM 04-03	AWL-21-01786-002	9/24/2021 9:55	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 05-03	AWL-21-01786-003	9/24/2021 10:50	9/24/21 15:19	BOD	
SWM 05-03	AWL-21-01786-003	9/24/2021 10:50	9/28/21 13:31	TSS	
SWM 05-03	AWL-21-01786-003	9/24/2021 10:50	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 06-03	AWL-21-01786-004	9/24/2021 8:35	9/24/21 15:19	BOD	
SWM 06-03	AWL-21-01786-004	9/24/2021 8:35	9/28/21 13:31	TSS	
SWM 06-03	AWL-21-01786-004	9/24/2021 8:35	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 07-03	AWL-21-01786-005	9/24/2021 7:05	9/24/21 15:19	BOD	
SWM 07-03	AWL-21-01786-005	9/24/2021 7:05	9/28/21 13:31	TSS	
SWM 07-03	AWL-21-01786-005	9/24/2021 7:05	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 08-03	AWL-21-01786-006	9/24/2021 7:15	9/24/21 15:19	BOD	
SWM 08-03	AWL-21-01786-006	9/24/2021 7:15	9/28/21 13:31	TSS	
SWM 08-03	AWL-21-01786-006	9/24/2021 7:15	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 08-03 DUP	AWL-21-01786-007	9/24/2021 7:20	9/24/21 15:19	BOD	
SWM 08-03 DUP	AWL-21-01786-007	9/24/2021 7:20	9/28/21 13:31	TSS	
SWM 08-03 DUP	AWL-21-01786-007	9/24/2021 7:20	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 09-03	AWL-21-01786-008	9/24/2021 7:55	9/24/21 15:19	BOD	
SWM 09-03	AWL-21-01786-008	9/24/2021 7:55	9/28/21 13:31	TSS	
SWM 09-03	AWL-21-01786-008	9/24/2021 7:55	10/25/21 14:20	Hardness	Calc from Ca and Mg

SWM 10-03	AWL-21-01786-009	9/24/2021 8:15	9/24/21 15:19	BOD	
SWM 10-03	AWL-21-01786-009	9/24/2021 8:15	9/28/21 13:31	TSS	
SWM 10-03	AWL-21-01786-009	9/24/2021 8:15	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 11-03	AWL-21-01786-010	9/24/2021 9:10	9/24/21 15:19	BOD	
SWM 11-03	AWL-21-01786-010	9/24/2021 9:10	9/28/21 13:31	TSS	
SWM 11-03	AWL-21-01786-010	9/24/2021 9:10	10/25/21 14:20	Hardness	Calc from Ca and Mg
SWM 12-03	AWL-21-01786-011	9/24/2021 10:10	9/24/21 15:19	BOD	
SWM 12-03	AWL-21-01786-011	9/24/2021 10:10	9/28/21 13:31	TSS	
SWM 12-03	AWL-21-01786-011	9/24/2021 10:10	10/25/21 14:27	Hardness	Calc from Ca and Mg
SWM 12-03 DUP	AWL-21-01786-012	9/24/2021 10:15	9/24/21 15:19	BOD	
SWM 12-03 DUP	AWL-21-01786-012	9/24/2021 10:15	9/28/21 13:31	TSS	
SWM 12-03 DUP	AWL-21-01786-012	9/24/2021 10:15	10/25/21 14:27	Hardness	Calc from Ca and Mg
SWM 12-03	AWL-21-01786-013	9/24/2021 10:20	9/24/21 15:19	BOD	
SWM 12-03	AWL-21-01786-013	9/24/2021 10:20	9/28/21 13:31	TSS	
SWM 12-03	AWL-21-01786-013	9/24/2021 10:20	10/25/21 14:27	Hardness	Calc from Ca and Mg

Subcontracted

Sample Location	AWL ID	Collection Date/Time	Analysis Date/Time	Analysis	Notes
SWM 03-03	AWL-21-01786-001	9/24/2021 9:45	10/13/21 16:25	200.8 DISS	K2111549-001
SWM 03-03	AWL-21-01786-001	9/24/2021 9:45	10/18/21 14:04	200.7	K2111549-013
SWM 04-03	AWL-21-01786-002	9/24/2021 9:55	10/13/21 16:32	200.8 DISS	K2111549-002
SWM 04-03	AWL-21-01786-002	9/24/2021 9:55	10/18/21 14:06	200.7	K2111549-014
SWM 05-03	AWL-21-01786-003	9/24/2021 10:50	10/5/21 16:16	624	1216351001
SWM 05-03	AWL-21-01786-003	9/24/2021 10:50	9/30/21 21:12	625 SIM	1216351001
SWM 05-03	AWL-21-01786-003	9/24/2021 10:50	10/13/21 16:34	200.8 DISS	K2111549-003
SWM 05-03	AWL-21-01786-003	9/24/2021 10:50	10/18/21 14:09	200.7	K2111549-015
SWM 06-03	AWL-21-01786-004	9/24/2021 8:35	10/13/21 16:37	200.8 DISS	K2111549-004
SWM 06-03	AWL-21-01786-004	9/24/2021 8:35	10/18/21 14:26	200.7	K2111549-016
SWM 07-03	AWL-21-01786-005	9/24/2021 7:05	10/5/21 16:31	624	1216351002
SWM 07-03	AWL-21-01786-005	9/24/2021 7:05	9/30/21 21:32	625 SIM	1216351002
SWM 07-03	AWL-21-01786-005	9/24/2021 7:05	10/13/21 16:39	200.8 DISS	K2111549-005
SWM 07-03	AWL-21-01786-005	9/24/2021 7:05	10/18/21 14:31	200.7	K2111549-017
SWM 08-03	AWL-21-01786-006	9/24/2021 7:15	10/13/21 16:41	200.8 DISS	K2111549-006
SWM 08-03	AWL-21-01786-006	9/24/2021 7:15	10/18/21 14:33	200.7	K2111549-018
SWM 08-03 DUP	AWL-21-01786-007	9/24/2021 7:20	10/13/21 16:43	200.8 DISS	K2111549-007
SWM 08-03 DUP	AWL-21-01786-007	9/24/2021 7:20	10/18/21 14:36	200.7	K2111549-019
SWM 09-03	AWL-21-01786-008	9/24/2021 7:55	10/5/21 16:45	624	1216351003
SWM 09-03	AWL-21-01786-008	9/24/2021 7:55	9/30/21 21:53	625 SIM	1216351003
SWM 09-03	AWL-21-01786-008	9/24/2021 7:55	10/13/21 16:46	200.8 DISS	K2111549-008
SWM 09-03	AWL-21-01786-008	9/24/2021 7:55	10/18/21 14:39	200.7	K2111549-020
SWM 10-03	AWL-21-01786-009	9/24/2021 8:15	10/13/21 16:48	200.8 DISS	K2111549-009
SWM 10-03	AWL-21-01786-009	9/24/2021 8:15	10/18/21 14:41	200.7	K2111549-021
SWM 11-03	AWL-21-01786-010	9/24/2021 9:10	10/13/21 16:50	200.8 DISS	K2111549-010
SWM 11-03	AWL-21-01786-010	9/24/2021 9:10	10/18/21 14:44	200.7	K2111549-022
SWM 12-03	AWL-21-01786-011	9/24/2021 10:10	10/5/21 17:00	624	1216351004
SWM 12-03	AWL-21-01786-011	9/24/2021 10:10	10/2/21 20:04	625 SIM	1216351004
SWM 12-03	AWL-21-01786-011	9/24/2021 10:10	10/13/21 16:52	200.8 DISS	K2111549-0011 Parent Sample MS/MSD (KQ2119905-01)
SWM 12-03	AWL-21-01786-011	9/24/2021 10:10	10/18/21 13:56	200.7	K2111549-023 Parent Sample MS/MSD (KQ2119903-01)
SWM 12-03 DUP	AWL-21-01786-012	9/24/2021 10:15	10/5/21 16:01	624	1216351005 - Parent Sample (1216351006/ 1216351007)

SWM 12-03 DUP	AWL-21-01786-012	9/24/2021 10:15	9/30/21 16:24	625 SIM	1216351005 - Parent Sample (1216351006/ 1216351007)
SWM 12-03 DUP	AWL-21-01786-012	9/24/2021 10:15	10/13/21 17:04	200.8 DISS	K2111549-012
SWM 12-03 DUP	AWL-21-01786-012	9/24/2021 10:15	10/18/21 14:55	200.7	K2111549-024
SWM 12-03	AWL-21-01786-013	9/24/2021 10:20	10/5/21 21:42	624	1216351006/ 1216351007
SWM 12-03	AWL-21-01786-013	9/24/2021 10:20	9/30/21 16:45	625 SIM	1216351006/ 1216351007
SWM TripBlank-03	AWL-21-01786-014	9/24/2021 10:10	10/5/21 15:31	624	1216351008 TRIP BLANK - TAH

Analytical Methods		
Analyte	Method	Comments
Fecal Coliform	SM9222D MF	
BOD	SM5210B	
TSS	SM2540D	
Hardness	SM2340B	
200.7	200.7	Ca, Mg for Hardness Calculation
200.8	200.8	Dissolved, Cu
PAH	624	TAqH Calc
TAqH	625 SIM	TAqH Calc

Cert Required WW
CMDP #

Log In Initials: MJG 9-28-21
DQO Initials: AKS 9-28-21

Comments:

Definitions:

DUP	Sample Duplicate
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MRL	Method Reporting Limit
MB	Method Blank
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
N/A	Not Applicable
TNTC	Count is Too Numerous To Count
<MDL	Result recovery is below the detectable laboratory limit, listed as the MDL

Data Qualifiers:

B	The result of both the method blank and the target sample are above the MDL.
D	Sample analysis accomplished through dilution.
J	The reported result is an estimated value above the LOD but below
U	Result is below the MDL, PQL, LOD, or LOQ
*	LCS/LCSD or Sample DUP fails all Duplicate criteria.
H	Holding time exceeded
E	Exceeds MCL

General Comments:

- 1.0) Basis: "As Received" = analyzed as received from client; "Dry" = dried prior to being analyzed; "Dry Weight Corrected" = analyzed as received; result corrected for percent moisture.

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 9:45
 PWS# None
 AWL Batch ID: 092421-01-FC
 AWL # AWL-21-01786
 Sample Location SWM 03-03
 AWL ID/ Fraction AWL-21-01786-001 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	210	CFU/100mL	10			10	SM9222D MF	AKS	9/24/21 13:49	10 mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 9:55
 PWS# None
 AWL Batch ID: 092421-01-FC
 AWL # AWL-21-01786
 Sample Location SWM 04-03
 AWL ID/ Fraction AWL-21-01786-002 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	9.09	CFU/100mL	9.091			9.09	SM9222D MF	AKS	9/24/21 13:49	1 & 10mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 10:50
 PWS# None
 AWL Batch ID: 092421-01-FC
 AWL # AWL-21-01786
 Sample Location SWM 05-03
 AWL ID/ Fraction AWL-21-01786-003 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	1,063.64	CFU/100mL	9.091			9.09	SM9222D MF	AKS	9/24/21 13:49	1 & 10mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 8:35
 PWS# None
 AWL Batch ID: 092421-01-FC
 AWL # AWL-21-01786
 Sample Location SWM 06-03
 AWL ID/ Fraction AWL-21-01786-004 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	310	CFU/100mL	10			10	SM9222D MF	AKS	9/24/21 13:49	10 mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 7:05
 PWS# None
 AWL Batch ID: 092421-01-FC
 AWL # AWL-21-01786
 Sample Location SWM 07-03
 AWL ID/ Fraction AWL-21-01786-005 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	2300	CFU/100mL	100			100	SM9222D MF	AKS	9/24/21 13:49	1mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 7:15
 PWS# None
 AWL Batch ID: 092421-01-FC
 AWL # AWL-21-01786
 Sample SWM 08-03
 Location
 AWL ID/ Fraction AWL-21-01786-006 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	310	CFU/100mL	10			10	SM9222D MF	AKS	9/24/21 13:49	10 mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 7:20
 PWS# None
 AWL Batch ID: 092421-01-FC
 AWL # AWL-21-01786
 Sample SWM 08-03 DUP
 Location
 AWL ID/ Fraction AWL-21-01786-007 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	350	CFU/100mL	10			10	SM9222D MF	AKS	9/24/21 13:49	10 mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 7:55
 PWS# None
 AWL Batch ID: 092421-02-FC
 AWL # AWL-21-01786
 Sample Location SWM 09-03
 AWL ID/ Fraction AWL-21-01786-008 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	54.55	CFU/100mL	9.091			9.09	SM9222D MF	AKS	9/24/21 14:15	1 & 10mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 8:15
 PWS# None
 AWL Batch ID: 092421-02-FC
 AWL # AWL-21-01786
 Sample Location SWM 10-03
 AWL ID/ Fraction AWL-21-01786-009 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	9.09	CFU/100mL	9.091			9.09	SM9222D MF	AKS	9/24/21 14:15	1 & 10mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 9:10
 PWS# None
 AWL Batch ID: 092421-02-FC
 AWL # AWL-21-01786
 Sample Location SWM 11-03
 AWL ID/ Fraction AWL-21-01786-010 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	320	CFU/100mL	10			10	SM9222D MF	AKS	9/24/21 14:15	10 mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 10:10
 PWS# None
 AWL Batch ID: 092421-02-FC
 AWL # AWL-21-01786
 Sample SWM 12-03
 Location
 AWL ID/ Fraction AWL-21-01786-011 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	4100	CFU/100mL	100			100	SM9222D MF	AKS	9/24/21 14:15	1mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 10:15
 PWS# None
 AWL Batch ID: 092421-02-FC
 AWL # AWL-21-01786
 Sample Location SWM 12-03 DUP
 AWL ID/ Fraction AWL-21-01786-012 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	3300	CFU/100mL	100			100	SM9222D MF	AKS	9/24/21 14:15	1mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-30-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 10:20
 PWS# None
 AWL Batch ID: 092421-02-FC
 AWL # AWL-21-01786
 Sample SWM 12-03
 Location
 AWL ID/ Fraction AWL-21-01786-013 Matrix AQ

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	5100	CFU/100mL	100			100	SM9222D MF	AKS	9/24/21 14:15	1mL used

Analyst Batching initials/date AKS 9-29-21
 Analyst reviewer initials/date MCC 9-24-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 9:45
 PWS# None

AWL # AWL-21-01786
 Sample SWM 03-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	6.19	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	27.05	mg/L	33.8207	15.1976		J	3.04	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	38.01	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 9:55
 PWS# None

AWL # AWL-21-01786
 Sample SWM 04-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	2.95	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	<MDL	mg/L	15.9413	7.16332		U	1.43	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments	Final results for TSS recovered under the MDL at 6.16 mg/L. JTR 10-5-21										
Hardness	42.36	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 10:50
 PWS# None

AWL # AWL-21-01786
 Sample SWM 05-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	5.07	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	20.40	mg/L	22.254	10		J	2	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	38.85	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)



Batch ID	102621-06-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-28-21
AWL ID	AWL-21-1786-003
Sample ID	SWM 05-03

Sampling Date	9/24/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/24/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>9/24/2021</u>
Acenaphthylene	<0.0232
Acenaphthene	<0.0232
Anthracene	<0.0232
Benzo(a)anthracene	<0.0232
Benzo(a)pyrene	<0.00925
Benzo(b)fluoranthene	<0.0232
Benzo(g,h,i)perylene	0.017
Benzo(k)fluoranthene	<0.0232
Chrysene	0.0273
Dibenzo(a,h)anthracene	<0.00925
Fluoranthene	0.0324
Fluorene	<0.0232
Indeno(1,2,3-cd)pyrene	<0.0232
Naphthalene	0.0347
Phenanthrene	0.0302
Pyrene	0.0299
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.172
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 8:35
 PWS# None

 AWL # AWL-21-01786
 Sample SWM 06-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	15.39	mg/L	3	0.9		D	3	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	42.25	mg/L	27.8175	12.5			2.5	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	19.38	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 7:05
 PWS# None

AWL # AWL-21-01786
 Sample SWM 07-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	7.94	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	67.33	mg/L	37.09	16.6667			3.33	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	14.96	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)



Batch ID	102621-07-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-28-21
AWL ID	AWL-21-01786-005
Sample ID	SWM 07-03

Sampling Date	9/24/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/24/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>9/24/2021</u>
Acenaphthylene	<0.0227
Acenaphthene	<0.0227
Anthracene	<0.0227
Benzo(a)anthracene	<0.0227
Benzo(a)pyrene	<0.00910
Benzo(b)fluoranthene	<0.0227
Benzo(g,h,i)perylene	0.0274
Benzo(k)fluoranthene	<0.0227
Chrysene	0.0382
Dibenzo(a,h)anthracene	<0.00910
Fluoranthene	0.0441
Fluorene	<0.0227
Indeno(1,2,3-cd)pyrene	<0.0227
Naphthalene	0.034
Phenanthrene	0.0505
Pyrene	0.0622
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.256
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 7:15
 PWS# None

AWL # AWL-21-01786
 Sample SWM 08-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	6.23	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	25.80	mg/L	22.254	10			2	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	14.32	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 7:20
 PWS# None

AWL # AWL-21-01786
 Sample SWM 08-03 DUP
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	6.21	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	28.80	mg/L	22.254	10			2	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	14.46	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 7:55
 PWS# None

AWL # AWL-21-01786
 Sample SWM 09-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	2.71	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	<MDL	mg/L	15.0772	6.78		U	1.36	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments	Final results for TSS recovered under the MDL at 2.17 mg/L. JTR 10-5-21										
Hardness	6.05	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)



Batch ID	102621-08-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-28-21
AWL ID	AWL-21-01786-008
Sample ID	SWM 09-03

Sampling Date	9/24/2021
----------------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/24/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>9/24/2021</u>
Acenaphthylene	<0.0227
Acenaphthene	<0.0227
Anthracene	<0.0227
Benzo(a)anthracene	<0.0227
Benzo(a)pyrene	<0.00910
Benzo(b)fluoranthene	<0.0227
Benzo(g,h,i)perylene	<0.0227
Benzo(k)fluoranthene	<0.0227
Chrysene	<0.0227
Dibenzo(a,h)anthracene	<0.00910
Fluoranthene	<0.0227
Fluorene	<0.0227
Indeno(1,2,3-cd)pyrene	<0.0227
Naphthalene	<0.0454
Phenanthrene	0.0163
Pyrene	<0.0227
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.016
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 8:15
 PWS# None

AWL # AWL-21-01786
 Sample SWM 10-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	3.37	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	<MDL	mg/L	15.8957	7.14		U	1.43	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments	Final results for TSS recovered under the MDL at 6.43 mg/L. JTR 10-5-21										
Hardness	94.06	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 9:10
 PWS# None

AWL # AWL-21-01786
 Sample SWM 11-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	3.46	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	21.65	mg/L	16.3873	7.36			1.47	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	18.68	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:20	102521-02-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 10:10
 PWS# None
 AWL # AWL-21-01786
 Sample SWM 12-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	8.35	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	193.00	mg/L	55.635	25			5	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	58.01	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:27	102521-03-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)



Batch ID	102621-09-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-28-21
AWL ID	AWL-21-01786-011
Sample ID	SWM 12-03

Sampling Date	9/24/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/24/2021</u>
Benzene	<0.200
Toluene	0.62
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>9/24/2021</u>
Acenaphthylene	<0.0240
Acenaphthene	<0.0240
Anthracene	<0.0240
Benzo(a)anthracene	<0.0240
Benzo(a)pyrene	<0.00960
Benzo(b)fluoranthene	0.0375
Benzo(g,h,i)perylene	0.0403
Benzo(k)fluoranthene	<0.0240
Chrysene	0.025
Dibenzo(a,h)anthracene	<0.00960
Fluoranthene	0.0558
Fluorene	<0.0240
Indeno(1,2,3-cd)pyrene	0.0163
Naphthalene	0.0362
Phenanthrene	0.0498
Pyrene	0.0727
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.954
Total Aromatic Hydrocarbons (TAH)	0.620

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 10:15
 PWS# None

AWL # AWL-21-01786
 Sample SWM 12-03 DUP
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	8.40	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	194.50	mg/L	55.635	25			5	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	59.58	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:27	102521-03-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)



Batch ID	102621-10-TAqH
Batching Initials/Date	MCC 10-26-21
Validation	AKS 10-28-21
AWL ID	AWL-21-01786-012
Sample ID	SWM 12-03 DUP

Sampling Date	9/24/2021
---------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>9/24/2021</u>
Benzene	<0.200
Toluene	0.62
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>9/24/2021</u>
Acenaphthylene	<0.0240
Acenaphthene	<0.0240
Anthracene	<0.0240
Benzo(a)anthracene	0.0225
Benzo(a)pyrene	<0.00960
Benzo(b)fluoranthene	0.0596
Benzo(g,h,i)perylene	0.0624
Benzo(k)fluoranthene	<0.0240
Chrysene	0.0367
Dibenzo(a,h)anthracene	<0.00960
Fluoranthene	0.0858
Fluorene	<0.0240
Indeno(1,2,3-cd)pyrene	0.0251
Naphthalene	0.0432
Phenanthrene	0.0735
Pyrene	0.117
Total Aqueous Aromatic Hydrocarbons (TAqH)	1.146
Total Aromatic Hydrocarbons (TAH)	0.620

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 9/24/21 10:20
 PWS# None

AWL # AWL-21-01786
 Sample SWM 12-03
 Location
 AWL ID/ Matrix AQ
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	8.63	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	9/24/21 15:19	092421-02-BOD
Comments											
TSS	191.50	mg/L	55.635	25			5	SM2540D	JTR	9/28/21 13:31	092821-01-TSS
Comments											
Hardness	58.01	mg/L	1	1			1	SM2340B	AKS	10/25/21 14:27	102521-03-Hardness
Comments											

Analyst Batching initials/date AKS 10-4-21(BOD), JTR 10-5-21 (TSS), AKS 10-25-21(Hardness)
 Analyst reviewer initials/date AKS 10-5-21(TSS), JTR 10-5-21 (BOD), JTR 10-26-21 (Hardness)

Alaska Laboratory# AK01000

Analysis QC Results

BOD SM 5210B

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
BOD	0.07		0.3	0.9		AKS	9/24/21 15:19

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
BOD	185.25		198	93.56	85-115	AKS	9/24/21 15:19

Sample Duplicate

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
BOD	6.05		6.19	2.29	≤20	AKS	9/24/21 15:19

Total Suspended Solids SM2540D

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
TSS	-0.20		5	11.1		JTR	9/28/2021 13:31

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
TSS	80.61		77.4	104.1473	90-110	JTR	9/28/2021 13:31

Sample Duplicate 1

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	191.00		191.50	0.26	≤20	JTR	9/28/2021 13:31

Sample Duplicate 2

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	191.50		193.00	0.78	≤20	JTR	9/28/2021 13:31



October 22, 2021

Service Request No:K2111549

Mary Curry
Alaska Water Laboratories
281 N. Main Street, Suite #101
Wasilla, AK 99654

Laboratory Results for: AWL-21-01786

Dear Mary,

Enclosed are the results of the sample(s) submitted to our laboratory October 04, 2021
For your reference, these analyses have been assigned our service request number **K2111549**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water

Service Request: K2111549
Date Received: 10/04/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twenty four water samples were received for analysis at ALS Environmental on 10/04/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy

Date 10/22/2021



SAMPLE DETECTION SUMMARY

CLIENT ID: AWL-21-01786-001-3		Lab ID: K2111549-001				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.51		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-002-3		Lab ID: K2111549-002				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.42		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-003-3		Lab ID: K2111549-003				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.75		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-004-3		Lab ID: K2111549-004				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	2.64		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-005-3		Lab ID: K2111549-005				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	5.77		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-006-3		Lab ID: K2111549-006				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.08		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-007-3		Lab ID: K2111549-007				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.48		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-008-3		Lab ID: K2111549-008				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	2.13		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-009-3		Lab ID: K2111549-009				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	2.98		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-010-3		Lab ID: K2111549-010				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	1.99		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-011-3-013-3		Lab ID: K2111549-011				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.18		0.05	0.10	ug/L	200.8
CLIENT ID: AWL-21-01786-012-3		Lab ID: K2111549-012				
Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.32		0.05	0.10	ug/L	200.8



SAMPLE DETECTION SUMMARY

CLIENT ID: AWL-21-01786-001-4 Lab ID: K2111549-013

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	9930		3	21	ug/L	200.7
Magnesium	3210		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-002-4 Lab ID: K2111549-014

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	12100		3	21	ug/L	200.7
Magnesium	2950		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-003-4 Lab ID: K2111549-015

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	11600		3	21	ug/L	200.7
Magnesium	2400		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-004-4 Lab ID: K2111549-016

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	5040		3	21	ug/L	200.7
Magnesium	1650		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-005-4 Lab ID: K2111549-017

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	3370		3	21	ug/L	200.7
Magnesium	1590		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-006-4 Lab ID: K2111549-018

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	4020		3	21	ug/L	200.7
Magnesium	1040		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-007-4 Lab ID: K2111549-019

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	4060		3	21	ug/L	200.7
Magnesium	1050		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-008-4 Lab ID: K2111549-020

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	2070		3	21	ug/L	200.7
Magnesium	213		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-009-4 Lab ID: K2111549-021

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	26900		3	21	ug/L	200.7
Magnesium	6530		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-010-4 Lab ID: K2111549-022

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	5850		3	21	ug/L	200.7

SAMPLE DETECTION SUMMARY

CLIENT ID: AWL-21-01786-010-4	Lab ID: K2111549-022
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Magnesium	989		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-011-4-013-4	Lab ID: K2111549-023
--	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	15200		3	21	ug/L	200.7
Magnesium	4870		0.4	5.3	ug/L	200.7

CLIENT ID: AWL-21-01786-012-4	Lab ID: K2111549-024
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Calcium	15300		3	21	ug/L	200.7
Magnesium	5190		0.4	5.3	ug/L	200.7



Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Alaska Water Laboratories
Project: AWL-21-01786

Service Request:K2111549

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2111549-001	AWL-21-01786-001-3	9/24/2021	0945
K2111549-002	AWL-21-01786-002-3	9/24/2021	0955
K2111549-003	AWL-21-01786-003-3	9/24/2021	1050
K2111549-004	AWL-21-01786-004-3	9/24/2021	0835
K2111549-005	AWL-21-01786-005-3	9/24/2021	0705
K2111549-006	AWL-21-01786-006-3	9/24/2021	0715
K2111549-007	AWL-21-01786-007-3	9/24/2021	0720
K2111549-008	AWL-21-01786-008-3	9/24/2021	0755
K2111549-009	AWL-21-01786-009-3	9/24/2021	0815
K2111549-010	AWL-21-01786-010-3	9/24/2021	0910
K2111549-011	AWL-21-01786-011-3-013-3	9/24/2021	1010
K2111549-012	AWL-21-01786-012-3	9/24/2021	1015
K2111549-013	AWL-21-01786-001-4	9/24/2021	0945
K2111549-014	AWL-21-01786-002-4	9/24/2021	0955
K2111549-015	AWL-21-01786-003-4	9/24/2021	1050
K2111549-016	AWL-21-01786-004-4	9/24/2021	0835
K2111549-017	AWL-21-01786-005-4	9/24/2021	0705
K2111549-018	AWL-21-01786-006-4	9/24/2021	0715
K2111549-019	AWL-21-01786-007-4	9/24/2021	0720
K2111549-020	AWL-21-01786-008-4	9/24/2021	0755
K2111549-021	AWL-21-01786-009-4	9/24/2021	0815
K2111549-022	AWL-21-01786-010-4	9/24/2021	0910
K2111549-023	AWL-21-01786-011-4-013-4	9/24/2021	1010
K2111549-024	AWL-21-01786-012-4	9/24/2021	1015

K2111549



281 N Main St., STE # 101
Wasilla AK, 99654
907-373-6130

FROM: Alaska Water Laboratories LLC.
281 N. Main St, STE101
Wasilla AK 99654

Sub-Contracted Lab: ALS Environmental
1317 S. 13th Ave.
Kelso, Wa 98626

Client Project Name: AWL-21-01786 **Certification Required:** AK-WW

Requested Due Date (if not standard TAT): Standard - Report to MDL; EDD

Samples				
AWL ID	Collection Date/ Time	Analysis	Comments	Matrix
AWL-21-01786-001-3	9/24/2021 9:45	200.8	Dissolved Cu	WW
AWL-21-01786-002-3	9/24/2021 9:55	200.8	Dissolved Cu	WW
AWL-21-01786-003-3	9/24/2021 10:50	200.8	Dissolved Cu	WW
AWL-21-01786-004-3	9/24/2021 8:35	200.8	Dissolved Cu	WW
AWL-21-01786-005-3	9/24/2021 7:05	200.8	Dissolved Cu	WW
AWL-21-01786-006-3	9/24/2021 7:15	200.8	Dissolved Cu	WW
AWL-21-01786-007-3	9/24/2021 7:20	200.8	Dissolved Cu	WW
AWL-21-01786-008-3	9/24/2021 7:55	200.8	Dissolved Cu	WW
AWL-21-01786-009-3	9/24/2021 8:15	200.8	Dissolved Cu	WW
AWL-21-01786-010-3	9/24/2021 9:10	200.8	Dissolved Cu	WW
AWL-21-01786-011-3	9/24/2021 10:10	200.8	Dissolved Cu	WW
AWL-21-01786-012-3	9/24/2021 10:15	200.8	Dissolved Cu	WW
AWL-21-01786-013-3-MS	9/24/2021 10:20	200.8	Dissolved Cu	WW
AWL-21-01786-013-3-MSD	9/24/2021 10:20	200.8	Dissolved Cu	WW
AWL-21-01786-001-4	9/24/2021 9:45	200.7	Ca & Mg	WW
AWL-21-01786-002-4	9/24/2021 9:55	200.7	Ca & Mg	WW
AWL-21-01786-003-4	9/24/2021 10:50	200.7	Ca & Mg	WW
AWL-21-01786-004-4	9/24/2021 8:35	200.7	Ca & Mg	WW
AWL-21-01786-005-4	9/24/2021 7:05	200.7	Ca & Mg	WW
AWL-21-01786-006-4	9/24/2021 7:15	200.7	Ca & Mg	WW
AWL-21-01786-007-4	9/24/2021 7:20	200.7	Ca & Mg	WW
AWL-21-01786-008-4	9/24/2021 7:55	200.7	Ca & Mg	WW
AWL-21-01786-009-4	9/24/2021 8:15	200.7	Ca & Mg	WW
AWL-21-01786-010-4	9/24/2021 9:10	200.7	Ca & Mg	WW
AWL-21-01786-011-4	9/24/2021 10:10	200.7	Ca & Mg	WW
AWL-21-01786-012-4	9/24/2021 10:15	200.7	Ca & Mg	WW
AWL-21-01786-013-4-MS	9/24/2021 10:20	200.7	Ca & Mg	WW
AWL-21-01786-013-4-MSD	9/24/2021 10:20	200.7	Ca & Mg	WW

<u>Relinquished By:</u> <i>[Signature]</i>	<u>Date&Time:</u> 9-29-21 11:13	<u>Received By:</u> M. Mulligan	<u>Date&Time:</u> 10/4/21 1100	<u>Temp:</u>
				<u>CoC Seal?</u> Y / N
<u>Relinquished By:</u>	<u>Date&Time:</u>	<u>Received By:</u>	<u>Date&Time:</u>	<u>Temp:</u>
				<u>CoC Seal?</u> Y / N

PM KL

Cooler Receipt and Preservation Form

Client Alaska Water Labs Service Request K21 11549
 Received: 10/4/21 Opened: 10/4/21 By: mm Unloaded: 10/4/21 By: mm

1. Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
 2. Samples were received in: (circle) Cooler Box Envelope Other NA
 3. Were custody seals on coolers? NA Y N If yes, how many and where? _____
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N
 4. Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
 5. Were samples received within the method specified temperature ranges? NA Y N
 If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N
- If applicable, tissue samples were received: **Frozen Partially Thawed Thawed**

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID /NA	Out of temp indicate with "X"	PM Notified If out of temp	Tracking Number NA	Filed
						940610369930 0022 038951	

6. Packing material: **Inserts** Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
7. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
8. Were samples received in good condition (unbroken) NA Y N
9. Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
10. Did all sample labels and tags agree with custody papers? NA Y N
11. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
12. Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
13. Were VOA vials received without headspace? Indicate in the table below. NA Y N
14. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:
<u>AWL-21-01986-(001-013)-4</u>	<u>AWL-21-01786-(001-013)-4</u>	<u>Elimination.</u>

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____



Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01786/

Service Request: K2111549

Sample Name: AWL-21-01786-001-3
Lab Code: K2111549-001
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-002-3
Lab Code: K2111549-002
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-003-3
Lab Code: K2111549-003
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-004-3
Lab Code: K2111549-004
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-005-3
Lab Code: K2111549-005
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01786/

Service Request: K2111549

Sample Name: AWL-21-01786-006-3
Lab Code: K2111549-006
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-007-3
Lab Code: K2111549-007
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-008-3
Lab Code: K2111549-008
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-009-3
Lab Code: K2111549-009
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-010-3
Lab Code: K2111549-010
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01786/

Service Request: K2111549

Sample Name: AWL-21-01786-011-3-013-3
Lab Code: K2111549-011
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-012-3
Lab Code: K2111549-012
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.8

Extracted/Digested By
SSOLADEY

Analyzed By
KLINN

Sample Name: AWL-21-01786-001-4
Lab Code: K2111549-013
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-002-4
Lab Code: K2111549-014
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-003-4
Lab Code: K2111549-015
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01786/

Service Request: K2111549

Sample Name: AWL-21-01786-004-4
Lab Code: K2111549-016
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-005-4
Lab Code: K2111549-017
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-006-4
Lab Code: K2111549-018
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-007-4
Lab Code: K2111549-019
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-008-4
Lab Code: K2111549-020
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01786/

Service Request: K2111549

Sample Name: AWL-21-01786-009-4
Lab Code: K2111549-021
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-010-4
Lab Code: K2111549-022
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-011-4-013-4
Lab Code: K2111549-023
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01786-012-4
Lab Code: K2111549-024
Sample Matrix: Water

Date Collected: 09/24/21
Date Received: 10/4/21

Analysis Method
200.7

Extracted/Digested By
SSOLADEY

Analyzed By
AMCKORNEY



Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-001-3
Lab Code: K2111549-001

Service Request: K2111549
Date Collected: 09/24/21 09:45
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.51	ug/L	0.10	0.05	1	10/13/21 16:25	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-002-3
Lab Code: K2111549-002

Service Request: K2111549
Date Collected: 09/24/21 09:55
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.42	ug/L	0.10	0.05	1	10/13/21 16:32	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-003-3
Lab Code: K2111549-003

Service Request: K2111549
Date Collected: 09/24/21 10:50
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.75	ug/L	0.10	0.05	1	10/13/21 16:34	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-004-3
Lab Code: K2111549-004

Service Request: K2111549
Date Collected: 09/24/21 08:35
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.64	ug/L	0.10	0.05	1	10/13/21 16:37	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-005-3
Lab Code: K2111549-005

Service Request: K2111549
Date Collected: 09/24/21 07:05
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	5.77	ug/L	0.10	0.05	1	10/13/21 16:39	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-006-3
Lab Code: K2111549-006

Service Request: K2111549
Date Collected: 09/24/21 07:15
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.08	ug/L	0.10	0.05	1	10/13/21 16:41	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-007-3
Lab Code: K2111549-007

Service Request: K2111549
Date Collected: 09/24/21 07:20
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.48	ug/L	0.10	0.05	1	10/13/21 16:43	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-008-3
Lab Code: K2111549-008

Service Request: K2111549
Date Collected: 09/24/21 07:55
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.13	ug/L	0.10	0.05	1	10/13/21 16:46	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-009-3
Lab Code: K2111549-009

Service Request: K2111549
Date Collected: 09/24/21 08:15
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	2.98	ug/L	0.10	0.05	1	10/13/21 16:48	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-010-3
Lab Code: K2111549-010

Service Request: K2111549
Date Collected: 09/24/21 09:10
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	1.99	ug/L	0.10	0.05	1	10/13/21 16:50	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-011-3-013-3
Lab Code: K2111549-011

Service Request: K2111549
Date Collected: 09/24/21 10:10
Date Received: 10/04/21 11:00

Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.18	ug/L	0.10	0.05	1	10/13/21 16:52	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-012-3
Lab Code: K2111549-012

Service Request: K2111549
Date Collected: 09/24/21 10:15
Date Received: 10/04/21 11:00
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.32	ug/L	0.10	0.05	1	10/13/21 17:04	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-001-4
Lab Code: K2111549-013

Service Request: K2111549
Date Collected: 09/24/21 09:45
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	9930	ug/L	21	3	1	10/18/21 14:04	10/11/21	
Magnesium	200.7	3210	ug/L	5.3	0.4	1	10/18/21 14:04	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-002-4
Lab Code: K2111549-014

Service Request: K2111549
Date Collected: 09/24/21 09:55
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	12100	ug/L	21	3	1	10/18/21 14:06	10/11/21	
Magnesium	200.7	2950	ug/L	5.3	0.4	1	10/18/21 14:06	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-003-4
Lab Code: K2111549-015

Service Request: K2111549
Date Collected: 09/24/21 10:50
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	11600	ug/L	21	3	1	10/18/21 14:09	10/11/21	
Magnesium	200.7	2400	ug/L	5.3	0.4	1	10/18/21 14:09	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-004-4
Lab Code: K2111549-016

Service Request: K2111549
Date Collected: 09/24/21 08:35
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	5040	ug/L	21	3	1	10/18/21 14:28	10/11/21	
Magnesium	200.7	1650	ug/L	5.3	0.4	1	10/18/21 14:28	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-005-4
Lab Code: K2111549-017

Service Request: K2111549
Date Collected: 09/24/21 07:05
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	3370	ug/L	21	3	1	10/18/21 14:31	10/11/21	
Magnesium	200.7	1590	ug/L	5.3	0.4	1	10/18/21 14:31	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-006-4
Lab Code: K2111549-018

Service Request: K2111549
Date Collected: 09/24/21 07:15
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	4020	ug/L	21	3	1	10/18/21 14:33	10/11/21	
Magnesium	200.7	1040	ug/L	5.3	0.4	1	10/18/21 14:33	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-007-4
Lab Code: K2111549-019

Service Request: K2111549
Date Collected: 09/24/21 07:20
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	4060	ug/L	21	3	1	10/18/21 14:36	10/11/21	
Magnesium	200.7	1050	ug/L	5.3	0.4	1	10/18/21 14:36	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-008-4
Lab Code: K2111549-020

Service Request: K2111549
Date Collected: 09/24/21 07:55
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	2070	ug/L	21	3	1	10/18/21 14:39	10/11/21	
Magnesium	200.7	213	ug/L	5.3	0.4	1	10/18/21 14:39	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-009-4
Lab Code: K2111549-021

Service Request: K2111549
Date Collected: 09/24/21 08:15
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	26900	ug/L	21	3	1	10/18/21 14:41	10/11/21	
Magnesium	200.7	6530	ug/L	5.3	0.4	1	10/18/21 14:41	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-010-4
Lab Code: K2111549-022

Service Request: K2111549
Date Collected: 09/24/21 09:10
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	5850	ug/L	21	3	1	10/18/21 14:44	10/11/21	
Magnesium	200.7	989	ug/L	5.3	0.4	1	10/18/21 14:44	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-011-4-013-4
Lab Code: K2111549-023

Service Request: K2111549
Date Collected: 09/24/21 10:10
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	15200	ug/L	21	3	1	10/18/21 13:56	10/11/21	
Magnesium	200.7	4870	ug/L	5.3	0.4	1	10/18/21 13:56	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: AWL-21-01786-012-4
Lab Code: K2111549-024

Service Request: K2111549
Date Collected: 09/24/21 10:15
Date Received: 10/04/21 11:00
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	15300	ug/L	21	3	1	10/18/21 14:55	10/11/21	
Magnesium	200.7	5190	ug/L	5.3	0.4	1	10/18/21 14:55	10/11/21	



QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: KQ2119903-03

Service Request: K2111549
Date Collected: NA
Date Received: NA
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	8 J	ug/L	21	3	1	10/18/21 13:51	10/11/21	
Magnesium	200.7	0.6 J	ug/L	5.3	0.4	1	10/18/21 13:51	10/11/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: KQ2119905-03

Service Request: K2111549
Date Collected: NA
Date Received: NA
Basis: NA

Dissolved Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Copper	200.8	ND U	ug/L	0.10	0.05	1	10/13/21 16:21	10/12/21	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water

Service Request: K2111549
Date Collected: 09/24/21
Date Received: 10/04/21
Date Analyzed: 10/18/21
Date Extracted: 10/11/21

Matrix Spike Summary
Total Metals

Sample Name: AWL-21-01786-011-4-013-4
Lab Code: K2111549-023
Analysis Method: 200.7
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2119903-01

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	15200	25200	10000	100	70-130
Magnesium	4870	15600	10000	107	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water

Service Request: K2111549
Date Collected: 09/24/21
Date Received: 10/04/21
Date Analyzed: 10/13/21
Date Extracted: 10/12/21

Matrix Spike Summary
Dissolved Metals

Sample Name: AWL-21-01786-011-3-013-3
Lab Code: K2111549-011
Analysis Method: 200.8
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2119905-01

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Copper	4.18	16.7	12.5	100	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water

Service Request: K2111549
Date Collected: 09/24/21
Date Received: 10/04/21
Date Analyzed: 10/18/21

Replicate Sample Summary

Total Metals

Sample Name: AWL-21-01786-011-4-013-4
Lab Code: K2111549-023

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2119903-05 Result			
Calcium	200.7	21	3	15200	15400	15300	1	20
Magnesium	200.7	5.3	0.4	4870	5370	5120	10	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water

Service Request: K2111549
Date Collected: 09/24/21
Date Received: 10/04/21
Date Analyzed: 10/13/21

Replicate Sample Summary
Dissolved Metals

Sample Name: AWL-21-01786-011-3-013-3
Lab Code: K2111549-011

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2119905-05 Result			
Copper	200.8	0.10	0.05	4.18	4.09	4.14	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water

Service Request: K2111549

Date Analyzed: 10/18/21

Lab Control Sample Summary

Total Metals

Units:ug/L

Basis:NA

Lab Control Sample

KQ2119903-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Calcium	200.7	12700	12500	101	85-115
Magnesium	200.7	12900	12500	103	85-115

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01786
Sample Matrix: Water

Service Request: K2111549

Date Analyzed: 10/13/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L

Basis:NA

Lab Control Sample

KQ2119905-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Copper	200.8	12.8	12.5	102	85-115

Laboratory Report of Analysis

To: Alaska Water Laboratories LLC.
281 N. Main Street Ste 101
Wasilla, AK 99654
907-373-6130

Report Number: **1216351**

Client Project: **AWL-21-01786**

Dear Mary Curry,

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 SGS 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.



Allie Lambe
2021.11.23 13:43:36 -09'00'

SGS Anchorage
Project Manager
ENV.ALASKA.PROJMAN@sgs.com

Date

Case Narrative

SGS Client: **Alaska Water Laboratories LLC.**

SGS Project: **1216351**

Project Name/Site: **AWL-21-01786**

Project Contact: **Mary Curry**

Refer to sample receipt form for information on sample condition.

AWL-21-01786-011 (1216351004) PS

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria. The sample was extracted twice and results confirm.

AWL-21-01786...(1216351005BMS) (1216351006) BMS

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

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria.

AWL-21-0178...(1216351005BMSD) (1216351007) BMSD

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

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria.

LCS for HBN 1826621 [VXX/37970 (1640393) LCS

8260D - LCS recovery for methyl iodide does not meet QC criteria, however this analyte is not being reported in the associated samples.

LCSD for HBN 1826621 [VXX/3797 (1640394) LCSD

8260D - LCSD recovery for methyl iodide does not meet QC criteria, however this analyte is not being reported in the associated samples.

1216351005MS (1638443) MS

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

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria.

1216351005MSD (1638444) MSD

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

8270D SIM - PAH surrogate recovery for fluoranthene-d10 does not meet QC criteria.

*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>
8270D SIM LV (PAH)				
1216351004	AWL-21-01786-011	XMS12930	Chrysene	RP
1216351005	AWL-21-01786-012	XMS12925	Chrysene	SP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Laboratory Qualifiers

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

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

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

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

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

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

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
AWL-21-01786-003	1216351001	09/24/2021	09/27/2021	Water (Surface, Eff., Ground)
AWL-21-01786-005	1216351002	09/24/2021	09/27/2021	Water (Surface, Eff., Ground)
AWL-21-01786-008	1216351003	09/24/2021	09/27/2021	Water (Surface, Eff., Ground)
AWL-21-01786-011	1216351004	09/24/2021	09/27/2021	Water (Surface, Eff., Ground)
AWL-21-01786-012	1216351005	09/24/2021	09/27/2021	Water (Surface, Eff., Ground)
AWL-21-01786...(1216351005BM	1216351006	09/24/2021	09/27/2021	Water (Surface, Eff., Ground)
AWL-21-0178...(1216351005BMS	1216351007	09/24/2021	09/27/2021	Water (Surface, Eff., Ground)
AWL-21-01786-014	1216351008	09/24/2021	09/27/2021	Water (Surface, Eff., Ground)

<u>Method</u>	<u>Method Description</u>
EPA 602/624	602 Aromatics by 624 (W)
8270D SIM LV (PAH)	8270 PAH SIM GC/MS LV

Print Date: 11/23/2021 1:39:12PM

Detectable Results Summary

Client Sample ID: **AWL-21-01786-003**

Lab Sample ID: 1216351001

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[g,h,i]perylene	0.0170J	ug/L
Chrysene	0.0273J	ug/L
Fluoranthene	0.0324J	ug/L
Naphthalene	0.0347J	ug/L
Phenanthrene	0.0302J	ug/L
Pyrene	0.0299J	ug/L

Client Sample ID: **AWL-21-01786-005**

Lab Sample ID: 1216351002

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[g,h,i]perylene	0.0274J	ug/L
Chrysene	0.0382J	ug/L
Fluoranthene	0.0441J	ug/L
Naphthalene	0.0340J	ug/L
Phenanthrene	0.0505	ug/L
Pyrene	0.0622	ug/L

Client Sample ID: **AWL-21-01786-008**

Lab Sample ID: 1216351003

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Phenanthrene	0.0163J	ug/L

Client Sample ID: **AWL-21-01786-011**

Lab Sample ID: 1216351004

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[b]Fluoranthene	0.0375J	ug/L
Benzo[g,h,i]perylene	0.0403J	ug/L
Chrysene	0.0250J	ug/L
Fluoranthene	0.0558	ug/L
Indeno[1,2,3-c,d] pyrene	0.0163J	ug/L
Naphthalene	0.0362J	ug/L
Phenanthrene	0.0498	ug/L
Pyrene	0.0727	ug/L
Toluene	0.620J	ug/L

Volatile GC/MS

Client Sample ID: **AWL-21-01786-012**

Lab Sample ID: 1216351005

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo(a)Anthracene	0.0225J	ug/L
Benzo[b]Fluoranthene	0.0596	ug/L
Benzo[g,h,i]perylene	0.0624	ug/L
Chrysene	0.0367J	ug/L
Fluoranthene	0.0858	ug/L
Indeno[1,2,3-c,d] pyrene	0.0251J	ug/L
Naphthalene	0.0432J	ug/L
Phenanthrene	0.0735	ug/L
Pyrene	0.117	ug/L
Toluene	0.610J	ug/L

Volatile GC/MS



Results of AWL-21-01786-003

Client Sample ID: **AWL-21-01786-003**
 Client Project ID: **AWL-21-01786**
 Lab Sample ID: 1216351001
 Lab Project ID: 1216351

Collection Date: 09/24/21 10:50
 Received Date: 09/27/21 13:58
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Acenaphthene	0.0232 U	0.0463	0.0139	ug/L	1		09/30/21 21:12
Acenaphthylene	0.0232 U	0.0463	0.0139	ug/L	1		09/30/21 21:12
Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		09/30/21 21:12
Benzo(a)Anthracene	0.0232 U	0.0463	0.0139	ug/L	1		09/30/21 21:12
Benzo[a]pyrene	0.00925 U	0.0185	0.00574	ug/L	1		09/30/21 21:12
Benzo[b]Fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		09/30/21 21:12
Benzo[g,h,i]perylene	0.0170 J	0.0463	0.0139	ug/L	1		09/30/21 21:12
Benzo[k]fluoranthene	0.0232 U	0.0463	0.0139	ug/L	1		09/30/21 21:12
Chrysene	0.0273 J	0.0463	0.0139	ug/L	1		09/30/21 21:12
Dibenzo[a,h]anthracene	0.00925 U	0.0185	0.00574	ug/L	1		09/30/21 21:12
Fluoranthene	0.0324 J	0.0463	0.0139	ug/L	1		09/30/21 21:12
Fluorene	0.0232 U	0.0463	0.0139	ug/L	1		09/30/21 21:12
Indeno[1,2,3-c,d] pyrene	0.0232 U	0.0463	0.0139	ug/L	1		09/30/21 21:12
Naphthalene	0.0347 J	0.0926	0.0287	ug/L	1		09/30/21 21:12
Phenanthrene	0.0302 J	0.0463	0.0139	ug/L	1		09/30/21 21:12
Pyrene	0.0299 J	0.0463	0.0139	ug/L	1		09/30/21 21:12
Surrogates							
2-Methylnaphthalene-d10 (surr)	66.5	42-86		%	1		09/30/21 21:12
Fluoranthene-d10 (surr)	76.2	50-97		%	1		09/30/21 21:12

Batch Information

Analytical Batch: XMS12925
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: LAW
 Analytical Date/Time: 09/30/21 21:12
 Container ID: 1216351001-A

Prep Batch: XXX45630
 Prep Method: SW3535A
 Prep Date/Time: 09/28/21 10:30
 Prep Initial Wt./Vol.: 270 mL
 Prep Extract Vol: 1 mL



Results of **AWL-21-01786-003**

Client Sample ID: **AWL-21-01786-003**
Client Project ID: **AWL-21-01786**
Lab Sample ID: 1216351001
Lab Project ID: 1216351

Collection Date: 09/24/21 10:50
Received Date: 09/27/21 13:58
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/05/21 16:16
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:16
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:16
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/05/21 16:16
Toluene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:16
Surrogates							
1,2-Dichloroethane-D4 (surr)	117	81-118		%	1		10/05/21 16:16
4-Bromofluorobenzene (surr)	109	85-114		%	1		10/05/21 16:16
Toluene-d8 (surr)	93	89-112		%	1		10/05/21 16:16

Batch Information

Analytical Batch: VMS21248
Analytical Method: EPA 602/624
Analyst: MDT
Analytical Date/Time: 10/05/21 16:16
Container ID: 1216351001-C

Prep Batch: VXX37970
Prep Method: SW5030B
Prep Date/Time: 10/05/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of **AWL-21-01786-005**

Client Sample ID: **AWL-21-01786-005**
Client Project ID: **AWL-21-01786**
Lab Sample ID: 1216351002
Lab Project ID: 1216351

Collection Date: 09/24/21 07:05
Received Date: 09/27/21 13:58
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	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:32
Acenaphthylene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:32
Anthracene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:32
Benzo(a)Anthracene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:32
Benzo[a]pyrene	0.00910 U	0.0182	0.00564	ug/L	1		09/30/21 21:32
Benzo[b]Fluoranthene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:32
Benzo[g,h,i]perylene	0.0274 J	0.0455	0.0136	ug/L	1		09/30/21 21:32
Benzo[k]fluoranthene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:32
Chrysene	0.0382 J	0.0455	0.0136	ug/L	1		09/30/21 21:32
Dibenzo[a,h]anthracene	0.00910 U	0.0182	0.00564	ug/L	1		09/30/21 21:32
Fluoranthene	0.0441 J	0.0455	0.0136	ug/L	1		09/30/21 21:32
Fluorene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:32
Indeno[1,2,3-c,d] pyrene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:32
Naphthalene	0.0340 J	0.0909	0.0282	ug/L	1		09/30/21 21:32
Phenanthrene	0.0505	0.0455	0.0136	ug/L	1		09/30/21 21:32
Pyrene	0.0622	0.0455	0.0136	ug/L	1		09/30/21 21:32
Surrogates							
2-Methylnaphthalene-d10 (surr)	52.3	42-86		%	1		09/30/21 21:32
Fluoranthene-d10 (surr)	59.5	50-97		%	1		09/30/21 21:32

Batch Information

Analytical Batch: XMS12925
Analytical Method: 8270D SIM LV (PAH)
Analyst: LAW
Analytical Date/Time: 09/30/21 21:32
Container ID: 1216351002-A

Prep Batch: XXX45630
Prep Method: SW3535A
Prep Date/Time: 09/28/21 10:30
Prep Initial Wt./Vol.: 275 mL
Prep Extract Vol: 1 mL



Results of **AWL-21-01786-005**

Client Sample ID: **AWL-21-01786-005**
Client Project ID: **AWL-21-01786**
Lab Sample ID: 1216351002
Lab Project ID: 1216351

Collection Date: 09/24/21 07:05
Received Date: 09/27/21 13:58
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/05/21 16:31
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:31
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:31
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/05/21 16:31
Toluene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:31
Surrogates							
1,2-Dichloroethane-D4 (surr)	104	81-118		%	1		10/05/21 16:31
4-Bromofluorobenzene (surr)	107	85-114		%	1		10/05/21 16:31
Toluene-d8 (surr)	96.8	89-112		%	1		10/05/21 16:31

Batch Information

Analytical Batch: VMS21248
Analytical Method: EPA 602/624
Analyst: MDT
Analytical Date/Time: 10/05/21 16:31
Container ID: 1216351002-C

Prep Batch: VXX37970
Prep Method: SW5030B
Prep Date/Time: 10/05/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of AWL-21-01786-008

Client Sample ID: **AWL-21-01786-008**
 Client Project ID: **AWL-21-01786**
 Lab Sample ID: 1216351003
 Lab Project ID: 1216351

Collection Date: 09/24/21 07:55
 Received Date: 09/27/21 13:58
 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	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Acenaphthylene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Anthracene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Benzo(a)Anthracene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Benzo[a]pyrene	0.00910 U	0.0182	0.00564	ug/L	1		09/30/21 21:53
Benzo[b]Fluoranthene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Benzo[g,h,i]perylene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Benzo[k]fluoranthene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Chrysene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Dibenzo[a,h]anthracene	0.00910 U	0.0182	0.00564	ug/L	1		09/30/21 21:53
Fluoranthene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Fluorene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Indeno[1,2,3-c,d] pyrene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Naphthalene	0.0454 U	0.0909	0.0282	ug/L	1		09/30/21 21:53
Phenanthrene	0.0163 J	0.0455	0.0136	ug/L	1		09/30/21 21:53
Pyrene	0.0227 U	0.0455	0.0136	ug/L	1		09/30/21 21:53
Surrogates							
2-Methylnaphthalene-d10 (surr)	43.2	42-86		%	1		09/30/21 21:53
Fluoranthene-d10 (surr)	56.2	50-97		%	1		09/30/21 21:53

Batch Information

Analytical Batch: XMS12925
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: LAW
 Analytical Date/Time: 09/30/21 21:53
 Container ID: 1216351003-A

Prep Batch: XXX45630
 Prep Method: SW3535A
 Prep Date/Time: 09/28/21 10:30
 Prep Initial Wt./Vol.: 275 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01786-008

Client Sample ID: **AWL-21-01786-008**
 Client Project ID: **AWL-21-01786**
 Lab Sample ID: 1216351003
 Lab Project ID: 1216351

Collection Date: 09/24/21 07:55
 Received Date: 09/27/21 13:58
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/05/21 16:45
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:45
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:45
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/05/21 16:45
Toluene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:45
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	81-118		%	1		10/05/21 16:45
4-Bromofluorobenzene (surr)	88.3	85-114		%	1		10/05/21 16:45
Toluene-d8 (surr)	91	89-112		%	1		10/05/21 16:45

Batch Information

Analytical Batch: VMS21248
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 10/05/21 16:45
 Container ID: 1216351003-C

Prep Batch: VXX37970
 Prep Method: SW5030B
 Prep Date/Time: 10/05/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of AWL-21-01786-011

Client Sample ID: **AWL-21-01786-011**
 Client Project ID: **AWL-21-01786**
 Lab Sample ID: 1216351004
 Lab Project ID: 1216351

Collection Date: 09/24/21 10:10
 Received Date: 09/27/21 13:58
 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	0.0240 U	0.0481	0.0144	ug/L	1		10/02/21 20:04
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		10/02/21 20:04
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		10/02/21 20:04
Benzo(a)Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		10/02/21 20:04
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		10/02/21 20:04
Benzo[b]Fluoranthene	0.0375 J	0.0481	0.0144	ug/L	1		10/02/21 20:04
Benzo[g,h,i]perylene	0.0403 J	0.0481	0.0144	ug/L	1		10/02/21 20:04
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		10/02/21 20:04
Chrysene	0.0250 J	0.0481	0.0144	ug/L	1		10/02/21 20:04
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		10/02/21 20:04
Fluoranthene	0.0558	0.0481	0.0144	ug/L	1		10/02/21 20:04
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		10/02/21 20:04
Indeno[1,2,3-c,d] pyrene	0.0163 J	0.0481	0.0144	ug/L	1		10/02/21 20:04
Naphthalene	0.0362 J	0.0962	0.0298	ug/L	1		10/02/21 20:04
Phenanthrene	0.0498	0.0481	0.0144	ug/L	1		10/02/21 20:04
Pyrene	0.0727	0.0481	0.0144	ug/L	1		10/02/21 20:04
Surrogates							
2-Methylnaphthalene-d10 (surr)	49.3	42-86		%	1		10/02/21 20:04
Fluoranthene-d10 (surr)	44.2	* 50-97		%	1		10/02/21 20:04

Batch Information

Analytical Batch: XMS12930
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: LAW
 Analytical Date/Time: 10/02/21 20:04
 Container ID: 1216351004-A

Prep Batch: XXX45655
 Prep Method: SW3535A
 Prep Date/Time: 10/01/21 16:30
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01786-011

Client Sample ID: **AWL-21-01786-011**
 Client Project ID: **AWL-21-01786**
 Lab Sample ID: 1216351004
 Lab Project ID: 1216351

Collection Date: 09/24/21 10:10
 Received Date: 09/27/21 13:58
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/05/21 17:00
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/05/21 17:00
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/05/21 17:00
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/05/21 17:00
Toluene	0.620 J	1.00	0.310	ug/L	1		10/05/21 17:00
Surrogates							
1,2-Dichloroethane-D4 (surr)	104	81-118		%	1		10/05/21 17:00
4-Bromofluorobenzene (surr)	96.5	85-114		%	1		10/05/21 17:00
Toluene-d8 (surr)	89.9	89-112		%	1		10/05/21 17:00

Batch Information

Analytical Batch: VMS21248
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 10/05/21 17:00
 Container ID: 1216351004-C

Prep Batch: VXX37970
 Prep Method: SW5030B
 Prep Date/Time: 10/05/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of AWL-21-01786-012

Client Sample ID: **AWL-21-01786-012**
 Client Project ID: **AWL-21-01786**
 Lab Sample ID: 1216351005
 Lab Project ID: 1216351

Collection Date: 09/24/21 10:15
 Received Date: 09/27/21 13:58
 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	0.0240 U	0.0481	0.0144	ug/L	1		09/30/21 16:24
Acenaphthylene	0.0240 U	0.0481	0.0144	ug/L	1		09/30/21 16:24
Anthracene	0.0240 U	0.0481	0.0144	ug/L	1		09/30/21 16:24
Benzo(a)Anthracene	0.0225 J	0.0481	0.0144	ug/L	1		09/30/21 16:24
Benzo[a]pyrene	0.00960 U	0.0192	0.00596	ug/L	1		09/30/21 16:24
Benzo[b]Fluoranthene	0.0596	0.0481	0.0144	ug/L	1		09/30/21 16:24
Benzo[g,h,i]perylene	0.0624	0.0481	0.0144	ug/L	1		09/30/21 16:24
Benzo[k]fluoranthene	0.0240 U	0.0481	0.0144	ug/L	1		09/30/21 16:24
Chrysene	0.0367 J	0.0481	0.0144	ug/L	1		09/30/21 16:24
Dibenzo[a,h]anthracene	0.00960 U	0.0192	0.00596	ug/L	1		09/30/21 16:24
Fluoranthene	0.0858	0.0481	0.0144	ug/L	1		09/30/21 16:24
Fluorene	0.0240 U	0.0481	0.0144	ug/L	1		09/30/21 16:24
Indeno[1,2,3-c,d] pyrene	0.0251 J	0.0481	0.0144	ug/L	1		09/30/21 16:24
Naphthalene	0.0432 J	0.0962	0.0298	ug/L	1		09/30/21 16:24
Phenanthrene	0.0735	0.0481	0.0144	ug/L	1		09/30/21 16:24
Pyrene	0.117	0.0481	0.0144	ug/L	1		09/30/21 16:24
Surrogates							
2-Methylnaphthalene-d10 (surr)	49.4	42-86		%	1		09/30/21 16:24
Fluoranthene-d10 (surr)	56.2	50-97		%	1		09/30/21 16:24

Batch Information

Analytical Batch: XMS12925
 Analytical Method: 8270D SIM LV (PAH)
 Analyst: LAW
 Analytical Date/Time: 09/30/21 16:24
 Container ID: 1216351005-A

Prep Batch: XXX45630
 Prep Method: SW3535A
 Prep Date/Time: 09/28/21 10:30
 Prep Initial Wt./Vol.: 260 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01786-012

Client Sample ID: **AWL-21-01786-012**
 Client Project ID: **AWL-21-01786**
 Lab Sample ID: 1216351005
 Lab Project ID: 1216351

Collection Date: 09/24/21 10:15
 Received Date: 09/27/21 13:58
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/05/21 16:01
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:01
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/05/21 16:01
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/05/21 16:01
Toluene	0.610 J	1.00	0.310	ug/L	1		10/05/21 16:01
Surrogates							
1,2-Dichloroethane-D4 (surr)	102	81-118		%	1		10/05/21 16:01
4-Bromofluorobenzene (surr)	97.4	85-114		%	1		10/05/21 16:01
Toluene-d8 (surr)	94.4	89-112		%	1		10/05/21 16:01

Batch Information

Analytical Batch: VMS21248
 Analytical Method: EPA 602/624
 Analyst: MDT
 Analytical Date/Time: 10/05/21 16:01
 Container ID: 1216351005-C

Prep Batch: VXX37970
 Prep Method: SW5030B
 Prep Date/Time: 10/05/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **AWL-21-01786-014**

Client Sample ID: **AWL-21-01786-014**
Client Project ID: **AWL-21-01786**
Lab Sample ID: 1216351008
Lab Project ID: 1216351

Collection Date: 09/24/21 07:05
Received Date: 09/27/21 13:58
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/05/21 15:31
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/05/21 15:31
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/05/21 15:31
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/05/21 15:31
Toluene	0.500 U	1.00	0.310	ug/L	1		10/05/21 15:31
Surrogates							
1,2-Dichloroethane-D4 (surr)	114	81-118		%	1		10/05/21 15:31
4-Bromofluorobenzene (surr)	106	85-114		%	1		10/05/21 15:31
Toluene-d8 (surr)	92.6	89-112		%	1		10/05/21 15:31

Batch Information

Analytical Batch: VMS21248
Analytical Method: EPA 602/624
Analyst: MDT
Analytical Date/Time: 10/05/21 15:31
Container ID: 1216351008-A

Prep Batch: VXX37970
Prep Method: SW5030B
Prep Date/Time: 10/05/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1826621 [VXX/37970]
 Blank Lab ID: 1640392

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1216351001, 1216351002, 1216351003, 1216351004, 1216351005, 1216351008

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	92.4	81-118		%
4-Bromofluorobenzene (surr)	96.1	85-114		%
Toluene-d8 (surr)	96.2	89-112		%

Batch Information

Analytical Batch: VMS21248
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: MDT
 Analytical Date/Time: 10/5/2021 12:11:00PM

Prep Batch: VXX37970
 Prep Method: SW5030B
 Prep Date/Time: 10/5/2021 6:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1216351 [VXX37970]
 Blank Spike Lab ID: 1640393
 Date Analyzed: 10/05/2021 12:26

Spike Duplicate ID: LCSD for HBN 1216351 [VXX37970]
 Spike Duplicate Lab ID: 1640394
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1216351001, 1216351002, 1216351003, 1216351004, 1216351005, 1216351008

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	28.9	96	30	28.2	94	(79-120)	2.40	(< 20)
Ethylbenzene	30	29.8	100	30	28.8	96	(79-121)	3.50	(< 20)
o-Xylene	30	30.4	101	30	29.4	98	(78-122)	3.40	(< 20)
P & M -Xylene	60	59.2	99	60	58.0	97	(80-121)	2.10	(< 20)
Toluene	30	28.9	96	30	28.0	93	(80-121)	3.30	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		105	30		106	(81-118)	1.30	
4-Bromofluorobenzene (surr)	30		102	30		104	(85-114)	1.40	
Toluene-d8 (surr)	30		97	30		95	(89-112)	1.20	

Batch Information

Analytical Batch: **VMS21248**
 Analytical Method: **EPA 602/624**
 Instrument: **Agilent 7890-75MS**
 Analyst: **MDT**

Prep Batch: **VXX37970**
 Prep Method: **SW5030B**
 Prep Date/Time: **10/05/2021 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: 1216351005
 MS Sample ID: 1216351006 BMS
 MSD Sample ID: 1216351007 BMSD

Analysis Date: 10/05/2021 16:01
 Analysis Date: 10/05/2021 21:42
 Analysis Date: 10/05/2021 21:56
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 602/624

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD_CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.200U	30.0	31	103	30.0	33.6	112	79-120	8.00	(< 20)
Ethylbenzene	0.500U	30.0	31.8	106	30.0	31.0	103	79-121	2.50	(< 20)
o-Xylene	0.500U	30.0	32.3	108	30.0	31.7	106	78-122	1.90	(< 20)
P & M -Xylene	1.00U	60.0	61.4	102	60.0	61.5	102	80-121	0.13	(< 20)
Toluene	0.610J	30.0	31.4	103	30.0	31.0	101	80-121	1.40	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	32.2	107	30.0	35.0	117	81-118	8.60	
4-Bromofluorobenzene (surr)		30.0	31.9	106	30.0	31.9	106	85-114	0.00	
Toluene-d8 (surr)		30.0	28.6	96	30.0	29.2	97	89-112	1.90	

Batch Information

Analytical Batch: VMS21248
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: MDT
 Analytical Date/Time: 10/5/2021 9:42:00PM

Prep Batch: VXX37970
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 10/5/2021 6:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Method Blank

Blank ID: MB for HBN 1826185 [XXX/45630]
 Blank Lab ID: 1638441

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1216351001, 1216351002, 1216351003, 1216351005

Results by 8270D SIM LV (PAH)

Parameter	Results	LOQ/CL	DL	Units
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0245J	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	65	42-86		%
Fluoranthene-d10 (surr)	90.4	50-97		%

Batch Information

Analytical Batch: XMS12925
 Analytical Method: 8270D SIM LV (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 9/30/2021 2:21:00PM

Prep Batch: XXX45630
 Prep Method: SW3535A
 Prep Date/Time: 9/28/2021 10:30:27AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1216351 [XXX45630]

Blank Spike Lab ID: 1638442

Date Analyzed: 09/30/2021 14:41

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1216351001, 1216351002, 1216351003, 1216351005

Results by 8270D SIM LV (PAH)

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Acenaphthene	2	1.52	76	(48-114)
Acenaphthylene	2	1.57	79	(35-121)
Anthracene	2	1.66	83	(53-119)
Benzo(a)Anthracene	2	1.84	92	(59-120)
Benzo[a]pyrene	2	1.89	95	(53-120)
Benzo[b]Fluoranthene	2	1.89	95	(53-126)
Benzo[g,h,i]perylene	2	1.99	100	(44-128)
Benzo[k]fluoranthene	2	2.01	100	(54-125)
Chrysene	2	1.94	97	(57-120)
Dibenzo[a,h]anthracene	2	1.99	99	(44-131)
Fluoranthene	2	1.78	89	(58-120)
Fluorene	2	1.61	81	(50-118)
Indeno[1,2,3-c,d] pyrene	2	1.97	98	(48-130)
Naphthalene	2	1.34	67	(43-114)
Phenanthrene	2	1.68	84	(53-115)
Pyrene	2	1.80	90	(53-121)

Surrogates

2-Methylnaphthalene-d10 (surr)	2		58	(42-86)
Fluoranthene-d10 (surr)	2		79	(50-97)

Batch Information

Analytical Batch: XMS12925

Analytical Method: 8270D SIM LV (PAH)

Instrument: Agilent GC 7890B/5977A SWA

Analyst: LAW

Prep Batch: XXX45630

Prep Method: SW3535A

Prep Date/Time: 09/28/2021 10:30

Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Dupe Init Wt./Vol.: Extract Vol:

Billable Matrix Spike Summary

Original Sample ID: 1216351005
 MS Sample ID: 1216351006 BMS
 MSD Sample ID: 1216351007 BMSD

Analysis Date: 09/30/2021 16:24
 Analysis Date: 09/30/2021 16:45
 Analysis Date: 09/30/2021 17:05
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by 8270D SIM LV (PAH)

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD_CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0240U	1.92	.927	48	1.92	1.07	56	48-114	14.30	(< 20)
Acenaphthylene	0.0240U	1.92	.992	52	1.92	1.14	59	35-121	13.50	(< 20)
Anthracene	0.0240U	1.92	.93	48 *	1.92	1.04	54	53-119	11.50	(< 20)
Benzo(a)Anthracene	0.0225J	1.92	.903	46 *	1.92	1.05	53	* 59-120	14.90	(< 20)
Benzo[a]pyrene	0.00960U	1.92	.869	45 *	1.92	1.05	55	53-120	19.00	(< 20)
Benzo[b]Fluoranthene	0.0596	1.92	.878	43 *	1.92	1.07	52	* 53-126	19.30	(< 20)
Benzo[g,h,i]perylene	0.0624	1.92	.833	40 *	1.92	1.02	50	44-128	20.50	* (< 20)
Benzo[k]fluoranthene	0.0240U	1.92	.93	48 *	1.92	1.04	54	54-125	11.10	(< 20)
Chrysene	0.0367J	1.92	.926	46 *	1.92	1.08	54	* 57-120	15.50	(< 20)
Dibenzo[a,h]anthracene	0.00960U	1.92	.819	43 *	1.92	0.999	52	44-131	19.80	(< 20)
Fluoranthene	0.0858	1.92	.954	45 *	1.92	1.06	51	* 58-120	10.60	(< 20)
Fluorene	0.0240U	1.92	.967	50	1.92	1.10	57	50-118	13.30	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0251J	1.92	.817	41 *	1.92	1.00	51	48-130	20.50	* (< 20)
Naphthalene	0.0432J	1.92	.917	45	1.92	1.10	55	43-114	18.00	(< 20)
Phenanthrene	0.0735	1.92	.963	46 *	1.92	1.11	54	53-115	14.00	(< 20)
Pyrene	0.117	1.92	.976	45 *	1.92	1.08	50	* 53-121	10.20	(< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		1.92	.745	39 *	1.92	0.900	47	42-86	18.80	
Fluoranthene-d10 (surr)		1.92	.82	43 *	1.92	0.908	47	* 50-97	10.10	

Batch Information

Analytical Batch: XMS12925
 Analytical Method: 8270D SIM LV (PAH)
 Instrument: Agilent GC 7890B/5977A SWA
 Analyst: LAW
 Analytical Date/Time: 9/30/2021 4:45:00PM

Prep Batch: XXX45630
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 9/28/2021 10:30:27AM
 Prep Initial Wt./Vol.: 260.00mL
 Prep Extract Vol: 1.00mL

Print Date: 11/23/2021 1:39:26PM

Method Blank

Blank ID: MB for HBN 1826439 [XXX/45655]
 Blank Lab ID: 1639560

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1216351004

Results by 8270D SIM LV (PAH)

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0181J	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	66.2	42-86		%
Fluoranthene-d10 (surr)	83	50-97		%

Batch Information

Analytical Batch: XMS12930
 Analytical Method: 8270D SIM LV (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: LAW
 Analytical Date/Time: 10/2/2021 4:19:00PM

Prep Batch: XXX45655
 Prep Method: SW3535A
 Prep Date/Time: 10/1/2021 4:30:45PM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1216351 [XXX45655]
 Blank Spike Lab ID: 1639561
 Date Analyzed: 10/02/2021 16:39

Spike Duplicate ID: LCSD for HBN 1216351
 [XXX45655]
 Spike Duplicate Lab ID: 1639562
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1216351004

Results by 8270D SIM LV (PAH)

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	2	1.60	80	2	1.74	87	(48-114)	8.40	(< 20)
Acenaphthylene	2	1.63	82	2	1.80	90	(35-121)	10.00	(< 20)
Anthracene	2	1.65	83	2	1.79	90	(53-119)	8.30	(< 20)
Benzo(a)Anthracene	2	1.68	84	2	1.78	89	(59-120)	5.30	(< 20)
Benzo[a]pyrene	2	1.72	86	2	1.84	92	(53-120)	6.90	(< 20)
Benzo[b]Fluoranthene	2	1.74	87	2	1.81	90	(53-126)	3.90	(< 20)
Benzo[g,h,i]perylene	2	1.87	93	2	1.98	99	(44-128)	6.10	(< 20)
Benzo[k]fluoranthene	2	1.76	88	2	1.89	94	(54-125)	7.00	(< 20)
Chrysene	2	1.72	86	2	1.83	92	(57-120)	6.60	(< 20)
Dibenzo[a,h]anthracene	2	1.85	93	2	1.98	99	(44-131)	6.50	(< 20)
Fluoranthene	2	1.67	83	2	1.76	88	(58-120)	5.60	(< 20)
Fluorene	2	1.66	83	2	1.80	90	(50-118)	8.20	(< 20)
Indeno[1,2,3-c,d] pyrene	2	1.83	92	2	1.95	98	(48-130)	6.20	(< 20)
Naphthalene	2	1.38	69	2	1.51	76	(43-114)	9.50	(< 20)
Phenanthrene	2	1.66	83	2	1.77	89	(53-115)	6.60	(< 20)
Pyrene	2	1.69	85	2	1.79	89	(53-121)	5.30	(< 20)
Surrogates									
2-Methylnaphthalene-d10 (surr)	2		63	2		69	(42-86)	10.30	
Fluoranthene-d10 (surr)	2		76	2		81	(50-97)	6.90	

Batch Information

Analytical Batch: XMS12930
 Analytical Method: 8270D SIM LV (PAH)
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: LAW

Prep Batch: XXX45655
 Prep Method: SW3535A
 Prep Date/Time: 10/01/2021 16:30
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

FROM: Alaska Water Laboratories LLC.
281 N. Main St, STE101
Wasilla AK 99654

1216351



Sub-Contracted Lab:

Client Project Name: AWL-21-01786 **Certification Required:** Wastewater

Requested Due Date (if not standard TAT): 10/15/2021 Report to MDL; EDD accompanying report

Samples

AWL ID	Collection Date/ Time	Analysis	Comments	Matrix
1AE AWL-21-01786-003	9/24/2021 10:50	624 TAH	VOA vials	WW
2AE AWL-21-01786-003	9/24/2021 10:50	625 M PAH	SIM - 2 containers	WW
3AE AWL-21-01786-005	9/24/2021 7:05	624 TAH	VOA vials	WW
4AE AWL-21-01786-005	9/24/2021 7:05	625 M PAH	SIM - 2 containers	WW
5AE AWL-21-01786-008	9/24/2021 7:55	624 TAH	VOA vials	WW
6AE AWL-21-01786-008	9/24/2021 7:55	625 M PAH	SIM - 2 containers	WW
7AE AWL-21-01786-011	9/24/2021 10:10	624 TAH	VOA vials	WW
8AE AWL-21-01786-011	9/24/2021 10:10	625 M PAH	SIM - 2 containers	WW
9AE AWL-21-01786-012	9/24/2021 10:15	624 TAH	VOA Vials; DUP VOL	WW
10AE AWL-21-01786-012	9/24/2021 10:15	625 M PAH	SIM - DUP VOL - 2 containers	WW
11AE AWL-21-01786-013	9/24/2021 10:20	624 TAH	VOA Vials; MS/MSD VOL	WW
12AE AWL-21-01786-013	9/24/2021 10:20	625 M PAH SIM	4 containers	WW
13AE AWL-21-01786-014	9/24/2021 7:05	624 TAH	VOA Vials; TRIP BLANKS	WW

Relinquished By: MCC	Date&Time: 9-27-21 10:10 AM	Received By: 	Date&Time:	Temp:
				CoC Seal? Y / N
Relinquished By: 	Date&Time:	Received By: Michelle Allen	Date&Time: 9/27/21 1358	Temp: Cooler: 1.7 DS8
				CoC Seal? Y / N IF

36966870



e-Sample Receipt Form

SGS Workorder #:

1216351

1216351

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		
		Yes
Exemption permitted if sampler hand carries/delivers.		
Were Custody Seals intact? Note # & location	Yes	1F
COC accompanied samples?	Yes	
DOD: Were samples received in COC corresponding coolers?		
<div style="display: flex; justify-content: space-between;"> N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required </div>		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	Yes	Cooler ID: @ 1.7 °C Therm. ID: D58
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	N/A	
If <0°C, were sample containers ice free?	Yes	
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		
Note: Refer to form F-083 "Sample Guide" for specific holding times.		
Were samples received within holding time?	Yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	Yes	
Note: If times differ <1hr, record details & login per COC. *Note: If sample information on containers differs from COC, SGS will default to COC information		
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals))	Yes	
Were proper containers (type/mass/volume/preservative***) used?	Yes	N/A
***Exemption permitted for metals (e.g, 200.8/6020B).		
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	Yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	Yes	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1216351001-A	No Preservative Required	OK			
1216351001-B	No Preservative Required	OK			
1216351001-C	HCL to pH < 2	OK			
1216351001-D	HCL to pH < 2	OK			
1216351001-E	HCL to pH < 2	OK			
1216351002-A	No Preservative Required	OK			
1216351002-B	No Preservative Required	OK			
1216351002-C	HCL to pH < 2	OK			
1216351002-D	HCL to pH < 2	OK			
1216351002-E	HCL to pH < 2	OK			
1216351003-A	No Preservative Required	OK			
1216351003-B	No Preservative Required	OK			
1216351003-C	HCL to pH < 2	OK			
1216351003-D	HCL to pH < 2	OK			
1216351003-E	HCL to pH < 2	OK			
1216351004-A	No Preservative Required	OK			
1216351004-B	No Preservative Required	OK			
1216351004-C	HCL to pH < 2	OK			
1216351004-D	HCL to pH < 2	OK			
1216351004-E	HCL to pH < 2	OK			
1216351005-A	No Preservative Required	OK			
1216351005-B	No Preservative Required	OK			
1216351005-C	HCL to pH < 2	OK			
1216351005-D	HCL to pH < 2	OK			
1216351005-E	HCL to pH < 2	OK			
1216351006-A	No Preservative Required	OK			
1216351006-B	No Preservative Required	OK			
1216351006-C	HCL to pH < 2	OK			
1216351006-D	HCL to pH < 2	OK			
1216351006-E	HCL to pH < 2	OK			
1216351007-A	No Preservative Required	OK			
1216351007-B	No Preservative Required	OK			
1216351007-C	HCL to pH < 2	OK			
1216351007-D	HCL to pH < 2	OK			
1216351007-E	HCL to pH < 2	OK			
1216351008-A	HCL to pH < 2	OK			
1216351008-B	HCL to pH < 2	OK			
1216351008-C	HCL to pH < 2	OK			

Container Id

Preservative

Container
Condition

Container Id

Preservative

Container
Condition

Container Condition Glossary

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

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

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

DM - The container was received damaged.

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

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

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

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

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

QN - Insufficient sample quantity provided.

AWL-21- 01786
Sampling Event ID:

Client/Company Name & Address: HDR Inc. 2525 C St. Suite 500 Anchorage, AK 99503		Public Water System (PWS) ID: Project Name: MOA Stormwater Monitoring		Section To Be Completed by AWL Quote Number: _____ SDG: _____ Account: _____ Check _____ Credit _____	
Contact Person: Cindy Helmericks Phone No.: 907.644-2017 Fax No.: ---		Invoice Contact Name & Address & Phone: HDR Inc. Calley Hall 2525 C St. Suite 500, Anchorage, AK 99503 907.644.2048		Requested Analysis/Method PO/Contract No.: 10314109, Task 1	
E-mail: cindy.helmericks@hdrinc.com		Requested Date for Results: Results to STATE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Routine <input type="checkbox"/> Non-Routine		Requested Analysis/Method	
Special Instructions/Requirements:		Turnaround Time (TAT) for Results <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited (prior authorization required) (____ days) please specify due date below; additional charges may apply		Requested Analysis/Method	
Kit Preparation/Shipping Charge:		Client Sample Identification (Name, Designation, Location, etc.)		Requested Analysis/Method	
1 SWM 03-03 001		Date Sampled: 9/24/21 Time Sampled: 9:45 Matrix: WS No. of Containers: 4		200.8 - Dissolved Cu (Lab Filter) 9222D - Fecal Coliform Preserv.: Na2SO4 2540D - Total Suspended Solids 5210B - BOD	
2 SWM 04-03 002		Date Sampled: 9/24/21 Time Sampled: 9:55 Matrix: WS No. of Containers: 4		EPA 625 SIM - TAqH Preservative: HCl	
3 SWM 05-03 003		Date Sampled: 10:50 Time Sampled: 10:50 Matrix: WS No. of Containers: 9		Hardness HNO3 EPA 200.8/2340B - Total	
4 SWM 06-03 004		Date Sampled: 8:35 Time Sampled: 8:35 Matrix: WS No. of Containers: 4		EPA 625 SIM - TAqH Preservative: HCl	
5 SWM 07-03 005		Date Sampled: 7:05 Time Sampled: 7:05 Matrix: WS No. of Containers: 9		EPA 625 SIM - TAqH Preservative: HCl	
6 SWM 08-03 006		Date Sampled: 7:15 Time Sampled: 7:15 Matrix: WS No. of Containers: 4		EPA 625 SIM - TAqH Preservative: HCl	
7 SWM 08-03 Dup 007		Date Sampled: 7:20 Time Sampled: 7:20 Matrix: WS No. of Containers: 4		EPA 625 SIM - TAqH Preservative: HCl	
8 SWM 09-03 008		Date Sampled: 7:55 Time Sampled: 7:55 Matrix: WS No. of Containers: 9		EPA 625 SIM - TAqH Preservative: HCl	
9 SWM 10-03 009		Date Sampled: 8:15 Time Sampled: 8:15 Matrix: WS No. of Containers: 4		EPA 625 SIM - TAqH Preservative: HCl	
10 SWM 11-03 010		Date Sampled: 9:10 Time Sampled: 9:10 Matrix: WS No. of Containers: 4		EPA 625 SIM - TAqH Preservative: HCl	
Relinquished by: Kay Sall		Date: 9/24/21 Time: 12:56		Section To Be Completed by AWL Condition of Custody Seal: Intact _____ Broken _____ Receiving location: HDR Temperature on arrival: 03-08 = 1.63C 04-12 = 1.63C 5,7,9,12 = 1.33C °C	
Relinquished by:		Date:		Thermometer ID # 1RT Measurement method: Temp Blank Other	
Relinquished by:		Date:		Shipping method/Tracking number:	
Name of Sampler: (printed) Kay Grundhauser		Date:		Shipping method/Tracking number:	



AWL Chain of Custody

Alaska Water Laboratories
281 N Main st, Suite # 101
Wasilla, AK 99654
907-373-6130

Custody form **MUST** be signed
Please provide as much information as possible

Sampling Event ID:

Client/Company Name & Address: HDR Inc. 2525 C St. Suite 500 Anchorage, AK 99503		Public Water System (PWS) ID: Project Name: MOA Stormwater Monitoring		Section To Be Completed by AWL Quote Number: <u>SDG:</u> Account: _____ Check: _____ Credit: _____	
Contact Person: Cindy Heimericks Phone No: 907.644-2017 Fax No: --- E-mail: cindy.heimericks@hdrinc.com		Turnaround Time (TAT) for Results <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited (prior authorization required) (in days) please specify due date below; additional charges may apply		Invoice Contact Name & Address & Phone: HDR Inc. Calley Hall 2525 C St. Suite 500, Anchorage, AK 99503 907.644.2048	
Requested Date for Results: Results to STATE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input type="checkbox"/> Routine <input type="checkbox"/> Non-Routine		PO/Contract No.: 10314109, Task 1	
Requested Analysis/Method					
Kit Preparation/Shipping Charge:	Client Sample Identification (Name, Designation, Location, etc.)	Date Sampled	Time Sampled	Matrix	No. of Containers
11 SWM 12-03 011		9/24/11	10:10	WS	9
12 SWM 12-03 Dup 012			10:15	WS	9
13 SWM 12-03 013			10:26	WS	14
14 SWM TripBlank-03 014			10:10	WS	3
15				WS	
16				WS	
17				WS	
18				WS	
19				WS	
20				WS	
		Received by:	Time	Date	Time
		<i>[Signature]</i>	12:56	9-24-11	13:09
		Received by:	Time	Date	Time
		Received by:	Time	Date	Time
Name of Sampler: (printed)					

Condition of Custody Seal: Intact _____ Broken _____	
Receiving location: AHL <i>[Signature]</i> pH 7.2 all personal 03-08 = 1.63°C 04-12 = 1.67°C 5, 7, 9, 12 = 1.37°C	
Thermometer ID # 187	Measurement method: Trip Bank _____ Other _____
Shipping method/Tracking number:	



Appendix C4
Laboratory Data Package
Storm Event #4



This page intentionally left blank.



281 N Main St., STE # 101
Wasilla AK, 99654
907-373-6130

Alaska Laboratory# AK01000

Client HDR Inc
Contact Cindy Helmericks

Project Name MOA Stormwater Monitoring
AWL # AWL-21-01970
PWS # None

Please direct any questions regarding the final report to Mary@AKWaterLabs.com or Matt@AKWaterLabs.com, or call 907-373-6130.

The results presented in this report meet the requirement of the laboratory's certifications and internal QC processes. Any exceptions will be noted in the case narratives attached. Reports with subcontracted laboratory data will be attached in full, with their quality control recoveries and case narrations.

The attached should contain analytical results for the analyses submitted on the client chain of custody. The information includes no opinions of the analysts or labs, data is represented after meeting certified testing requirements, and quality control measures.

Reproduction of the report in full requires the written approval of the laboratory.

Signature of Laboratory Management Date

Alaska Laboratory# AK01000

Client Project Name MOA Stormwater Monitoring AWL # AWL-21-01970

Receipt Date and Time 10/8/21 14:00 Due Date 10/22/2021

Cooler/Sample Temp (C) (05, 07, 09, 12 = 4.98) (09-12 = 3.48) (03-08 = 2.48) Sampler Initials KG

Sample Receipt Comments received by MJG 10-8-21, #1RT (05, 07, 09, 12=4.98C), (09-12=3.48C), (03-08=2.48C) all on frozen ice, pH<2 for all preserved samples

Samples Received

Microbiological

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-04	AWL-21-01970-001	10/8/2021 11:00	10/8/21 14:23	Fecal Coliform	
SWM 04-04	AWL-21-01970-002	10/8/2021 11:05	10/8/21 14:23	Fecal Coliform	
SWM 05-04	AWL-21-01970-003	10/8/2021 12:15	10/8/21 14:23	Fecal Coliform	
SWM 06-04	AWL-21-01970-004	10/8/2021 10:05	10/8/21 14:23	Fecal Coliform	
SWM 07-04	AWL-21-01970-005	10/8/2021 8:45	10/8/21 14:23	Fecal Coliform	
SWM 08-04	AWL-21-01970-006	10/8/2021 8:55	10/8/21 14:23	Fecal Coliform	
SWM 08-04 DUP	AWL-21-01970-007	10/8/2021 9:00	10/8/21 14:23	Fecal Coliform	
SWM 09-04	AWL-21-01970-008	10/8/2021 9:25	10/8/21 14:44	Fecal Coliform	
SWM 10-04	AWL-21-01970-009	10/8/2021 9:45	10/8/21 14:44	Fecal Coliform	
SWM 11-04	AWL-21-01970-010	10/8/2021 10:35	10/8/21 14:44	Fecal Coliform	
SWM 12-04	AWL-21-01970-011	10/8/2021 11:30	10/8/21 14:44	Fecal Coliform	
SWM 12-04 DUP	AWL-21-01970-012	10/8/2021 11:35	10/8/21 14:44	Fecal Coliform	
SWM 12-04	AWL-21-01970-013	10/8/2021 11:40	10/8/21 14:44	Fecal Coliform	

Chemical

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-04	AWL-21-01970-001	10/8/2021 11:00	10/8/21 16:07	BOD	
SWM 03-04	AWL-21-01970-001	10/8/2021 11:00	10/8/21 15:57	TSS	
SWM 03-04	AWL-21-01970-001	10/8/2021 11:00	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 04-04	AWL-21-01970-002	10/8/2021 11:05	10/8/21 16:07	BOD	
SWM 04-04	AWL-21-01970-002	10/8/2021 11:05	10/8/21 15:57	TSS	
SWM 04-04	AWL-21-01970-002	10/8/2021 11:05	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 05-04	AWL-21-01970-003	10/8/2021 12:15	10/8/21 16:07	BOD	
SWM 05-04	AWL-21-01970-003	10/8/2021 12:15	10/8/21 15:57	TSS	
SWM 05-04	AWL-21-01970-003	10/8/2021 12:15	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 06-04	AWL-21-01970-004	10/8/2021 10:05	10/8/21 16:07	BOD	
SWM 06-04	AWL-21-01970-004	10/8/2021 10:05	10/8/21 15:57	TSS	
SWM 06-04	AWL-21-01970-004	10/8/2021 10:05	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 07-04	AWL-21-01970-005	10/8/2021 8:45	10/8/21 16:07	BOD	
SWM 07-04	AWL-21-01970-005	10/8/2021 8:45	10/8/21 15:57	TSS	
SWM 07-04	AWL-21-01970-005	10/8/2021 8:45	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 08-04	AWL-21-01970-006	10/8/2021 8:55	10/8/21 16:07	BOD	
SWM 08-04	AWL-21-01970-006	10/8/2021 8:55	10/8/21 15:57	TSS	
SWM 08-04	AWL-21-01970-006	10/8/2021 8:55	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 08-04 DUP	AWL-21-01970-007	10/8/2021 9:00	10/8/21 16:07	BOD	
SWM 08-04 DUP	AWL-21-01970-007	10/8/2021 9:00	10/8/21 15:57	TSS	
SWM 08-04 DUP	AWL-21-01970-007	10/8/2021 9:00	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 09-04	AWL-21-01970-008	10/8/2021 9:25	10/8/21 16:07	BOD	
SWM 09-04	AWL-21-01970-008	10/8/2021 9:25	10/8/21 15:57	TSS	

SWM 09-04	AWL-21-01970-008	10/8/2021 9:25	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 10-04	AWL-21-01970-009	10/8/2021 9:45	10/8/21 16:07	BOD	
SWM 10-04	AWL-21-01970-009	10/8/2021 9:45	10/8/21 15:57	TSS	
SWM 10-04	AWL-21-01970-009	10/8/2021 9:45	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 11-04	AWL-21-01970-010	10/8/2021 10:35	10/8/21 16:07	BOD	
SWM 11-04	AWL-21-01970-010	10/8/2021 10:35	10/8/21 15:57	TSS	
SWM 11-04	AWL-21-01970-010	10/8/2021 10:35	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 12-04	AWL-21-01970-011	10/8/2021 11:30	10/8/21 16:07	BOD	
SWM 12-04	AWL-21-01970-011	10/8/2021 11:30	10/8/21 15:57	TSS	
SWM 12-04	AWL-21-01970-011	10/8/2021 11:30	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 12-04 DUP	AWL-21-01970-012	10/8/2021 11:35	10/8/21 16:07	BOD	
SWM 12-04 DUP	AWL-21-01970-012	10/8/2021 11:35	10/8/21 15:57	TSS	
SWM 12-04 DUP	AWL-21-01970-012	10/8/2021 11:35	11/2/21 7:55	Hardness	Calc from Ca and Mg
SWM 12-04	AWL-21-01970-013	10/8/2021 11:40	10/8/21 16:07	BOD	
SWM 12-04	AWL-21-01970-013	10/8/2021 11:40	10/8/21 15:57	TSS	

Subcontracted

Sample Location	AWL ID	Collection Date/ Time	Analysis Date/Time	Analysis	Notes
SWM 03-04	AWL-21-01970-001	10/8/2021 11:00	10/29/21 13:20	200.8 DISS	K2112171-013
SWM 03-04	AWL-21-01970-001	10/8/2021 11:00	10/25/21 9:28	200.7	K2112171-001
SWM 04-04	AWL-21-01970-002	10/8/2021 11:05	10/29/21 13:21	200.8 DISS	K2112171-014
SWM 04-04	AWL-21-01970-002	10/8/2021 11:05	10/25/21 9:36	200.7	K2112171-002
SWM 05-04	AWL-21-01970-003	10/8/2021 12:15	10/18/21 2:38	624	1216736001
SWM 05-04	AWL-21-01970-003	10/8/2021 12:15	10/15/21 19:44	625 SIM	1216736001
SWM 05-04	AWL-21-01970-003	10/8/2021 12:15	10/29/21 13:23	200.8 DISS	K2112171-015
SWM 05-04	AWL-21-01970-003	10/8/2021 12:15	10/25/21 9:39	200.7	K2112171-003
SWM 06-04	AWL-21-01970-004	10/8/2021 10:05	10/29/21 13:24	200.8 DISS	K2112171-016
SWM 06-04	AWL-21-01970-004	10/8/2021 10:05	10/25/21 9:42	200.7	K2112171-004
SWM 07-04	AWL-21-01970-005	10/8/2021 8:45	10/18/21 2:53	624	1216736002
SWM 07-04	AWL-21-01970-005	10/8/2021 8:45	10/15/21 20:05	625 SIM	1216736002
SWM 07-04	AWL-21-01970-005	10/8/2021 8:45	10/29/21 13:26	200.8 DISS	K2112171-017
SWM 07-04	AWL-21-01970-005	10/8/2021 8:45	10/25/21 9:44	200.7	K2112171-005
SWM 08-04	AWL-21-01970-006	10/8/2021 8:55	10/29/21 13:28	200.8 DISS	K2112171-018
SWM 08-04	AWL-21-01970-006	10/8/2021 8:55	10/25/21 9:55	200.7	K2112171-006
SWM 08-04 DUP	AWL-21-01970-007	10/8/2021 9:00	10/29/21 13:29	200.8 DISS	K2112171-019
SWM 08-04 DUP	AWL-21-01970-007	10/8/2021 9:00	10/25/21 9:58	200.7	K2112171-007
SWM 09-04	AWL-21-01970-008	10/8/2021 9:25	10/18/21 3:08	624	1216736003
SWM 09-04	AWL-21-01970-008	10/8/2021 9:25	10/15/21 20:25	625 SIM	1216736003
SWM 09-04	AWL-21-01970-008	10/8/2021 9:25	10/29/21 13:31	200.8 DISS	K2112171-020
SWM 09-04	AWL-21-01970-008	10/8/2021 9:25	10/25/21 10:01	200.7	K2112171-008
SWM 10-04	AWL-21-01970-009	10/8/2021 9:45	10/29/21 13:32	200.8 DISS	K2112171-021
SWM 10-04	AWL-21-01970-009	10/8/2021 9:45	10/25/21 10:03	200.7	K2112171-009
SWM 11-04	AWL-21-01970-010	10/8/2021 10:35	10/29/21 13:37	200.8 DISS	K2112171-022
SWM 11-04	AWL-21-01970-010	10/8/2021 10:35	10/25/21 10:06	200.7	K2112171-010
SWM 12-04	AWL-21-01970-011	10/8/2021 11:30	10/18/21 3:23	624	1216736004

SWM 12-04	AWL-21-01970-011	10/8/2021 11:30	10/15/21 20:46	625 SIM	1216736004
SWM 12-04	AWL-21-01970-011	10/8/2021 11:30	10/29/21 13:39	200.8 DISS	K2112171-023 PARENT SAMPLE
SWM 12-04	AWL-21-01970-011	10/8/2021 11:30	10/25/21 10:09	200.7	K2112171-011 PARENT SAMPLE
SWM 12-04 DUP	AWL-21-01970-012	10/8/2021 11:35	10/18/21 0:54	624	1216736005 - PARENT SAMPLE
SWM 12-04 DUP	AWL-21-01970-012	10/8/2021 11:35	10/15/21 21:06	625 SIM	1216736005 PARENT SAMPLE
SWM 12-04 DUP	AWL-21-01970-012	10/8/2021 11:35	10/29/21 13:43	200.8 DISS	K2112171-024
SWM 12-04 DUP	AWL-21-01970-012	10/8/2021 11:35	10/25/21 10:17	200.7	K2112171-012
SWM 12-04	AWL-21-01970-013	10/8/2021 11:40	10/18/21 6:51	624	1216736006/ 1216736007
SWM 12-04	AWL-21-01970-013	10/8/2021 11:40	10/15/21 21:47	625 SIM	1216736006/ 1216736007
SWM TripBlank-04	AWL-21-01970-014	10/8/2021 8:45	10/17/21 23:55	624	1216736008 TRIP BLANK - TAH

Analytical Methods

Analyte	Method	Comments
Fecal Coliform	SM9222D MF	
BOD	SM5210B	
TSS	SM2540D	
Hardness	SM2340B	
200.7	200.7	Ca, Mg for Hardness Calculation
200.8	200.8	Dissolved, Cu
PAH	624	TAqH Calc
TAqH	625 SIM	TAqH Calc

Cert Required WW
CMDP #

Log In Initials: AKS 10-18-21
DQO Initials: MJG 10-27-21

Comments: Metals and Hardness were not reported for AWL-21-01970-013 as those are MS/MSD to sample AWL-21-01970-011.

Definitions:

DUP	Sample Duplicate
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MRL	Method Reporting Limit
MB	Method Blank
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MS/MSD	Matrix Spike/Matrix Spike Duplicate
N/A	Not Applicable
TNTC	Count is Too Numerous To Count
<MDL	Result recovery is below the detectable laboratory limit, listed as the MDL

Data Qualifiers:

B	The result of both the method blank and the target sample are above the MDL.
D	Sample analysis accomplished through dilution.
J	The reported result is an estimated value above the LOD but below
U	Result is below the MDL, PQL, LOD, or LOQ
*	LCS/LCSD or Sample DUP fails all Duplicate criteria.
H	Holding time exceeded
E	Exceeds MCL

General Comments:

- 1.0) Basis: "As Received" = analyzed as received from client; "Dry" = dried prior to being analyzed; "Dry Weight Corrected" = analyzed as received; result corrected for percent moisture.

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:00
 PWS# None
 AWL Batch ID: 100821-01-FC
 AWL # AWL-21-01970
 Sample Location SWM 03-04
 AWL ID/ Fraction AWL-21-01970-001 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	<9.09	CFU/100mL	9.091		U	9.09	SM9222D MF	AKS	10/8/21 14:23	1 & 10 mL Used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:05
 PWS# None
 AWL Batch ID: 100821-01-FC

AWL # AWL-21-01970
 Sample Location SWM 04-04
 AWL ID/ Fraction AWL-21-01970-002 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	<9.09	CFU/100mL	9.091		U	9.09	SM9222D MF	AKS	10/8/21 14:23	1 & 10 mL Used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 12:15
 PWS# None
 AWL Batch ID: 100821-01-FC
 AWL # AWL-21-01970
 Sample Location SWM 05-04
 AWL ID/ Fraction AWL-21-01970-003 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	136.36	CFU/100mL	9.091			9.09	SM9222D MF	AKS	10/8/21 14:23	1 & 10 mL Used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 10/8/21 10:05
 PWS# None
 AWL Batch ID: 100821-01-FC
 AWL # AWL-21-01970
 Sample Location SWM 06-04
 AWL ID/ Fraction AWL-21-01970-004 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	6100	CFU/100mL	100			100	SM9222D MF	AKS	10/8/21 14:23	1 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 8:45
 PWS# None
 AWL Batch ID: 100821-01-FC
 AWL # AWL-21-01970
 Sample Location SWM 07-04
 AWL ID/ Fraction AWL-21-01970-005 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	470	CFU/100mL	10			10.00	SM9222D MF	AKS	10/8/21 14:23	10 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 8:55
 PWS# None
 AWL Batch ID: 100821-01-FC
 AWL # AWL-21-01970
 Sample Location SWM 08-04
 AWL ID/ Fraction AWL-21-01970-006 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	881.82	CFU/100mL	9.091			9.09	SM9222D MF	AKS	10/8/21 14:23	1 & 10 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 9:00
 PWS# None
 AWL Batch ID: 100821-01-FC
 AWL # AWL-21-01970
 Sample Location SWM 08-04 DUP
 AWL ID/ Fraction AWL-21-01970-007 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	954.55	CFU/100mL	9.091			9.09	SM9222D MF	AKS	10/8/21 14:23	1 & 10 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 9:25
 PWS# None
 AWL Batch ID: 100821-02-FC
 AWL # AWL-21-01970
 Sample Location SWM 09-04
 AWL ID/ Fraction AWL-21-01970-008 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	9.09	CFU/100mL	9.091			9.09	SM9222D MF	AKS	10/8/21 14:44	1 & 10 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 9:45
 PWS# None
 AWL Batch ID: 100821-02-FC
 AWL # AWL-21-01970
 Sample Location SWM 10-04
 AWL ID/ Fraction AWL-21-01970-009 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	<9.09	CFU/100mL	9.09		U	9.09	SM9222D MF	AKS	10/8/21 14:44	1 & 10 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 10:35
 PWS# None
 AWL Batch ID: 100821-02-FC
 AWL # AWL-21-01970
 Sample Location SWM 11-04
 AWL ID/ Fraction AWL-21-01970-010 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	2200	CFU/100mL	100			100	SM9222D MF	AKS	10/8/21 14:44	1 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-27-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:30
 PWS# None
 AWL Batch ID: 100821-02-FC
 AWL # AWL-21-01970
 Sample Location SWM 12-04
 AWL ID/ Fraction AWL-21-01970-011 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	272.73	CFU/100mL	90.91			90.9	SM9222D MF	AKS	10/8/21 14:44	0.1 and 1 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-28-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:35
 PWS# None
 AWL Batch ID: 100821-02-FC
 AWL # AWL-21-01970
 Sample SWM 12-04 DUP
 Location
 AWL ID/ Fraction AWL-21-01970-012 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	363.64	CFU/100mL	90.91			90.9	SM9222D MF	AKS	10/8/21 14:44	0.1 and 1 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-28-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N **Date / time** 10/8/21 11:40
 PWS# None
AWL Batch ID: 100821-02-FC
 AWL # AWL-21-01970
 Sample SWM 12-04
 Location
 AWL ID/ Fraction AWL-21-01970-013 Matrix SW

Analyte	Result	Units	MDL	MCL	Flags	DF	Method	Analyst	Date/Time	Notes
Fecal Coliform	90.91	CFU/100mL	90.91			90.9	SM9222D MF	AKS	10/8/21 14:44	0.1 and 1 mL used

Analyst Batching initials/date AKS 10-18-21
 Analyst reviewer initials/date JTR 10-28-21

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:00
 PWS# None

AWL # AWL-21-01970
 Sample SWM 03-04
 Location
 AWL ID/ Fraction AWL-21-01970-001 Matrix SW

Analysis	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID	
BOD	4.01	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	<MDL	mg/L	30.4016	13.66		U	2.73	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments	Final results for TSS recovered under the MDL at 1.64 mg/L. JTR 10-26-21										
Hardness	188.00	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:05
 PWS# None

AWL # AWL-21-01970
 Sample SWM 04-04
 Location
 AWL ID/ Fraction AWL-21-01970-002 Matrix SW

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	3.55	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	14.98	mg/L	18.1221	8.14		J	1.63	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	284.47	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
 JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 12:15
 PWS# None

AWL # AWL-21-01970
 Sample SWM 05-04
 Location
 AWL ID/ Fraction AWL-21-01970-003 Matrix SW

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	44.00	mg/L	6	1.8		D	6	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	31.20	mg/L	22.254	10.00			2.00	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	140.81	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)



Batch ID	110821-01-TAqH
Batching Initials/Date	MCC 11-8-21
Validation	AKS 11-8-21
AWL ID	AWL-21-01970-003
Sample ID	SWM 05-04

Sampling Date	10/8/2021
----------------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>10/8/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>10/8/2021</u>
Acenaphthylene	<0.0255
Acenaphthene	<0.0255
Anthracene	<0.0255
Benzo(a)anthracene	<0.0255
Benzo(a)pyrene	<0.0102
Benzo(b)fluoranthene	<0.0255
Benzo(g,h,i)perylene	<0.0255
Benzo(k)fluoranthene	<0.0255
Chrysene	<0.0255
Dibenzo(a,h)anthracene	<0.0102
Fluoranthene	<0.0255
Fluorene	<0.0255
Indeno(1,2,3-cd)pyrene	<0.0255
Naphthalene	<0.0510
Phenanthrene	0.0159
Pyrene	<0.0255
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.016
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 10:05
 PWS# None

AWL # AWL-21-01970
 Sample SWM 06-04
 Location
 AWL ID/ Matrix SW
 Fraction AWL-21-01970-004

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	43.46	mg/L	6	1.8		D	6	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	15.25	mg/L	27.8175	12.5		J	2.50	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	55.67	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 10/8/21 8:45
 PWS# None

AWL # AWL-21-01970
 Sample SWM 07-04
 Location
 AWL ID/ Matrix SW
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	29.60	mg/L	6	1.8		D	6	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	137.00	mg/L	111.27	50			10	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	54.69	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)



Batch ID	110821-02-TAqH
Batching Initials/Date	MCC 11-8-21
Validation	AKS 11-8-21
AWL ID	AWL-21-01970-005
Sample ID	SWM 07-04

Sampling Date	10/8/2021
----------------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>10/8/2021</u>
Benzene	<0.200
Toluene	0.512
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>10/8/2021</u>
Acenaphthylene	<0.0236
Acenaphthene	<0.0236
Anthracene	<0.0236
Benzo(a)anthracene	<0.0236
Benzo(a)pyrene	<0.00945
Benzo(b)fluoranthene	<0.0236
Benzo(g,h,i)perylene	0.0467
Benzo(k)fluoranthene	<0.0236
Chrysene	0.0194
Dibenzo(a,h)anthracene	<0.00945
Fluoranthene	0.0662
Fluorene	<0.0236
Indeno(1,2,3-cd)pyrene	<0.0236
Naphthalene	0.0466
Phenanthrene	0.076
Pyrene	0.103
Total Aqueous Aromatic Hydrocarbons (TAqH)	0.870
Total Aromatic Hydrocarbons (TAH)	0.512

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 8:55
 PWS# None

AWL # AWL-21-01970
 Sample SWM 08-04
 Location
 AWL ID/ Matrix SW
 Fraction AWL-21-01970-006

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	30.50	mg/L	6.00	1.80		D	6.00	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	80.00	mg/L	55.635	25			5	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	97.81	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N Date / time 10/8/21 9:00
 PWS# None

AWL # AWL-21-01970
 Sample SWM 08-04 DUP
 Location
 AWL ID/ Matrix SW
 Fraction AWL-21-01970-007

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	28.88	mg/L	6.00	1.80		D	6.00	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	69.00	mg/L	55.635	25.00			5.00	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	105.95	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 9:25
 PWS# None

AWL # AWL-21-01970
 Sample SWM 09-04
 Location
 AWL ID/ Fraction AWL-21-01970-008 Matrix SW

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	4.78	mg/L	1.5	0.45		D	1.5	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	253.50	mg/L	55.635	25.00			5.00	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	46.00	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
 JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)



Batch ID	110821-03-TAqH
Batching Initials/Date	MCC 11-8-21
Validation	AKS 11-8-21
AWL ID	AWL-21-01970-008
Sample ID	SWM 09-04

Sampling Date	10/8/2021
----------------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>10/8/2021</u>
Benzene	<0.200
Toluene	<0.500
Ethylbenzene	<0.500
o-Xylene	<0.500
m,p Xylene	<1.0
<u>625 PAH</u>	<u>10/8/2021</u>
Acenaphthylene	<0.0236
Acenaphthene	0.0189
Anthracene	0.0591
Benzo(a)anthracene	0.404
Benzo(a)pyrene	0.585
Benzo(b)fluoranthene	0.879
Benzo(g,h,i)perylene	0.53
Benzo(k)fluoranthene	0.31
Chrysene	0.582
Dibenzo(a,h)anthracene	0.113
Fluoranthene	1.03
Fluorene	0.0211
Indeno(1,2,3-cd)pyrene	0.434
Naphthalene	0.0319
Phenanthrene	0.358
Pyrene	0.864
Total Aqueous Aromatic Hydrocarbons (TAqH)	6.220
Total Aromatic Hydrocarbons (TAH)	<1

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 9:45
 PWS# None

AWL # AWL-21-01970
 Sample SWM 10-04
 Location
 AWL ID/ Fraction AWL-21-01970-009 Matrix SW

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	16.14	mg/L	3	0.9		D	3	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	8.11	mg/L	15.5622	6.99		J	1.40	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	135.66	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 10:35
 PWS# None

AWL # AWL-21-01970
 Sample SWM 11-04
 Location
 AWL ID/ Fraction AWL-21-01970-010 Matrix SW

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	42.92	mg/L	6	1.8		D	6	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	17.20	mg/L	22.254	10.00		J	2.00	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	53.95	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-01-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:30
 PWS# None

AWL # AWL-21-01970
 Sample SWM 12-04
 Location
 AWL ID/ Matrix SW
 Fraction AWL-21-01970-011

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	18.96	mg/L	3	0.9		D	3	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	40.00	mg/L	22.254	10			2	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	251.51	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)



Batch ID	110821-04-TAqH
Batching Initials/Date	MCC 11-8-21
Validation	AKS 11-8-21
AWL ID	AWL-21-01970-011
Sample ID	SWM 12-04

Sampling Date	10/8/2021
----------------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>10/8/2021</u>
Benzene	<0.200
Toluene	2.77
Ethylbenzene	<0.500
o-Xylene	0.966
m,p Xylene	2.05
<u>625 PAH</u>	<u>10/8/2021</u>
Acenaphthylene	<0.0255
Acenaphthene	<0.0255
Anthracene	<0.0255
Benzo(a)anthracene	<0.0255
Benzo(a)pyrene	<0.0102
Benzo(b)fluoranthene	<0.0255
Benzo(g,h,i)perylene	0.0205
Benzo(k)fluoranthene	<0.0255
Chrysene	<0.0255
Dibenzo(a,h)anthracene	<0.0102
Fluoranthene	0.035
Fluorene	<0.0255
Indeno(1,2,3-cd)pyrene	<0.0255
Naphthalene	0.056
Phenanthrene	0.0441
Pyrene	0.0481
Total Aqueous Aromatic Hydrocarbons (TAqH)	5.990
Total Aromatic Hydrocarbons (TAH)	5.786

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:35
 PWS# None

AWL # AWL-21-01970
 Sample SWM 12-04 DUP
 Location
 AWL ID/ Matrix SW
 Fraction

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	19.04	mg/L	3	0.9		D	3	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	40.60	mg/L	22.254	10			2.00	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											
Hardness	249.69	mg/L	0.021	0.003			1	SM2340B	JTR	11/2/21 7:55	110221-02-Hardness
Comments											

Analyst Batching initials/date
 Analyst reviewer initials/date

AKS 10-19-21 (BOD), JTR 10-26-21 (TSS), JTR 11-2-21 (Hardness)
 JTR 10-28-21 (BOD), AKS 10-28-21(TSS), AKS 11-2-21 (Hardness)



Batch ID	110821-05-TAqH
Batching Initials/Date	MCC 11-8-21
Validation	AKS 11-8-21
AWL ID	AWL-21-01970-012
Sample ID	SWM 12-04 DUP

Sampling Date	10/8/2021
----------------------	-----------

<u>Parameter</u>	<u>Concentration (ug/l)</u>
<u>624 BTEX & Chlorobenzenes</u>	<u>10/8/2021</u>
Benzene	<0.200
Toluene	2.69
Ethylbenzene	<0.500
o-Xylene	0.932
m,p Xylene	1.96
<u>625 PAH</u>	<u>10/8/2021</u>
Acenaphthylene	<0.0255
Acenaphthene	<0.0255
Anthracene	<0.0255
Benzo(a)anthracene	<0.0255
Benzo(a)pyrene	<0.0102
Benzo(b)fluoranthene	<0.0225
Benzo(g,h,i)perylene	0.0221
Benzo(k)fluoranthene	<0.0255
Chrysene	<0.0255
Dibenzo(a,h)anthracene	(0.0102
Fluoranthene	0.0303
Fluorene	<0.0255
Indeno(1,2,3-cd)pyrene	<0.0255
Naphthalene	0.0497
Phenanthrene	0.043
Pyrene	0.0462
Total Aqueous Aromatic Hydrocarbons (TAqH)	5.773
Total Aromatic Hydrocarbons (TAH)	5.582

Alaska Laboratory# AK01000

Client HDR Inc
 Contact Cindy Helmericks
 Project MOA Stormwater Monitoring **Collection**
 DW Y/N N Date / time 10/8/21 11:40
 PWS# None

AWL # AWL-21-01970
 Sample SWM 12-04
 Location
 AWL ID/ Matrix SW
 Fraction AWL-21-01970-013

Analysis	Results	Units	MRL	MDL	MCL	Flags	DF	Method	Analyst	Date/ Time	Batch ID
BOD	19.26	mg/L	3	0.9		D	3	SM5210B	AKS	10/8/21 16:07	100821-01-BOD
Comments											
TSS	38.60	mg/L	22.254	10			2	SM2540D	JTR	10/8/21 15:57	100821-01-TSS
Comments											

Analyst Batching initials/date AKS 10-19-21 (BOD), JTR 10-26-21 (TSS)
 Analyst reviewer initials/date JTR 10-28-21 (BOD), AKS 10-28-21(TSS)

Alaska Laboratory# AK01000

Analysis QC Results

BOD SM 5210B

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
BOD	0.12		0.3	0.9		AKS	10/8/2021 16:07

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
BOD	200.70		198	101.36	85-115	AKS	10/8/2021 16:07

Sample Duplicate

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
BOD	3.98		4.01	0.75	≤20	AKS	10/8/2021 16:07

Total Suspended Solids SM2540D

Method Blank

Analyte	MB	Flags	MDL	MRL	CRDL	Analyst	Date/Time
TSS	-0.20		5	11.1		JTR	10/8/2021 15:57

LCS

Analyte	LCS	Flags	Spike Amount	Percent Recovery	Limits	Analyst	Date/Time
TSS	73.50		77.4	94.96	90-110	JTR	10/8/2021 15:57

Sample Duplicate 1

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	258.00		246.00	4.76	≤20	JTR	10/8/2021 15:57

Sample Duplicate 2

Analyte	Sample Duplicate	Flags	Parent Sample	RPD	Limits	Analyst	Date/Time
TSS	136.00		137.00	0.73	≤20	JTR	10/8/2021 15:57



October 29, 2021

Service Request No:K2112171

Mary Curry
Alaska Water Laboratories
281 N. Main Street, Suite #101
Wasilla, AK 99654

Laboratory Results for: AWL-21-01970

Dear Mary,

Enclosed are the results of the sample(s) submitted to our laboratory October 15, 2021
For your reference, these analyses have been assigned our service request number **K2112171**.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental



Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171
Date Received: 10/15/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Twenty four water samples were received for analysis at ALS Environmental on 10/15/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy

Date 10/29/2021



SAMPLE DETECTION SUMMARY

CLIENT ID: AWL-21-01970-009-3	Lab ID: K2112171-021
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
---------	---------	------	-----	-----	-------	--------

CLIENT ID: AWL-21-01970-010-3	Lab ID: K2112171-022
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	9.40		0.05	0.10	ug/L	200.8

CLIENT ID: AWL-21-01970-011-3-013-3	Lab ID: K2112171-023
--	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	4.97		0.05	0.10	ug/L	200.8

CLIENT ID: AWL-21-01970-012-3	Lab ID: K2112171-024
--------------------------------------	-----------------------------

Analyte	Results	Flag	MDL	MRL	Units	Method
Copper, Dissolved	5.08		0.05	0.10	ug/L	200.8



Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: Alaska Water Laboratories
Project: AWL-21-01970

Service Request:K2112171

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
K2112171-001	AWL-21-01970-001-4	10/8/2021	1100
K2112171-002	AWL-21-01970-002-4	10/8/2021	1105
K2112171-003	AWL-21-01970-003-4	10/8/2021	1215
K2112171-004	AWL-21-01970-004-4	10/8/2021	1005
K2112171-005	AWL-21-01970-005-4	10/8/2021	0845
K2112171-006	AWL-21-01970-006-4	10/8/2021	0855
K2112171-007	AWL-21-01970-007-4	10/8/2021	0900
K2112171-008	AWL-21-01970-008-4	10/8/2021	0925
K2112171-009	AWL-21-01970-009-4	10/8/2021	0945
K2112171-010	AWL-21-01970-010-4	10/8/2021	1035
K2112171-011	AWL-21-01970-011-4-013-4	10/8/2021	1130
K2112171-012	AWL-21-01970-012-4	10/8/2021	1135
K2112171-013	AWL-21-01970-001-3	10/8/2021	1100
K2112171-014	AWL-21-01970-002-3	10/8/2021	1105
K2112171-015	AWL-21-01970-003-3	10/8/2021	1215
K2112171-016	AWL-21-01970-004-3	10/8/2021	1005
K2112171-017	AWL-21-01970-005-3	10/8/2021	0845
K2112171-018	AWL-21-01970-006-3	10/8/2021	0855
K2112171-019	AWL-21-01970-007-3	10/8/2021	0900
K2112171-020	AWL-21-01970-008-3	10/8/2021	0925
K2112171-021	AWL-21-01970-009-3	10/8/2021	0945
K2112171-022	AWL-21-01970-010-3	10/8/2021	1035
K2112171-023	AWL-21-01970-011-3-013-3	10/8/2021	1130
K2112171-024	AWL-21-01970-012-3	10/8/2021	1135

22112171

FROM: Alaska Water Laboratories LLC.
281 N. Main St, STE101
Wasilla AK 99654
Mary@AKWaterLabs.com

Sub-Contracted Lab:

ALS Environmental
1317 S. 13th Ave.
Kelso, Wa 98626

Client Project Name: AWL-21-01970 **Certification Required:** AK WW
Requested Due Date (if not standard TAT): Standard

Samples

AWL ID	Collection Date/ Time	Analysis	Comments	Matrix
AWL-21-01970-001-4	10/8/2021 11:00	200.7	Ca & Mg	Storm Water
AWL-21-01970-002-4	10/8/2021 11:05	200.7	Ca & Mg	Storm Water
AWL-21-01970-003-4	10/8/2021 12:15	200.7	Ca & Mg	Storm Water
AWL-21-01970-004-4	10/8/2021 10:05	200.7	Ca & Mg	Storm Water
AWL-21-01970-005-4	10/8/2021 8:45	200.7	Ca & Mg	Storm Water
AWL-21-01970-006-4	10/8/2021 8:55	200.7	Ca & Mg	Storm Water
AWL-21-01970-007-4	10/8/2021 9:00	200.7	Ca & Mg	Storm Water
AWL-21-01970-008-4	10/8/2021 9:25	200.7	Ca & Mg	Storm Water
AWL-21-01970-009-4	10/8/2021 9:45	200.7	Ca & Mg	Storm Water
AWL-21-01970-010-4	10/8/2021 10:35	200.7	Ca & Mg	Storm Water
AWL-21-01970-011-4	10/8/2021 11:30	200.7	Ca & Mg	Storm Water
AWL-21-01970-012-4	10/8/2021 11:35	200.7	Ca & Mg	Storm Water
AWL-21-01970-013-4-MS	10/8/2021 11:40	200.7	Ca & Mg	Storm Water
AWL-21-01970-013-4-MSD	10/8/2021 11:40	200.7	Ca & Mg	Storm Water
AWL-21-01970-001-3	10/8/2021 11:00	200.8	Filtered at lab	Storm Water
AWL-21-01970-002-3	10/8/2021 11:05	200.8	Filtered at lab	Storm Water
AWL-21-01970-003-3	10/8/2021 12:15	200.8	Filtered at lab	Storm Water
AWL-21-01970-004-3	10/8/2021 10:05	200.8	Filtered at lab	Storm Water
AWL-21-01970-005-3	10/8/2021 8:45	200.8	Filtered at lab	Storm Water
AWL-21-01970-006-3	10/8/2021 8:55	200.8	Filtered at lab	Storm Water
AWL-21-01970-007-3	10/8/2021 9:00	200.8	Filtered at lab	Storm Water
AWL-21-01970-008-3	10/8/2021 9:25	200.8	Filtered at lab	Storm Water
AWL-21-01970-009-3	10/8/2021 9:45	200.8	Filtered at lab	Storm Water
AWL-21-01970-010-3	10/8/2021 10:35	200.8	Filtered at lab	Storm Water
AWL-21-01970-011-3	10/8/2021 11:30	200.8	Filtered at lab	Storm Water
AWL-21-01970-012-3	10/8/2021 11:35	200.8	Filtered at lab	Storm Water
AWL-21-01970-013-3-MS	10/8/2021 11:40	200.8	Filtered at lab	Storm Water
AWL-21-01970-013-3-MSD	10/8/2021 11:40	200.8	Filtered at lab	Storm Water

Relinquished By: <i>[Signature]</i>	Date&Time: 10-12-21 9:00	Received By: <i>M. Mulligan</i> ALS	Date&Time: 10/13/21 1030	Temp:
				CoC Seal? Y / N
Relinquished By:	Date&Time:	Received By:	Date&Time:	Temp:
				CoC Seal? Y / N

Cooler Receipt and Preservation Form

Client Alaska Water Labs Service Request K21 12171
 Received: 10/15/21 Opened: 10/15/21 By: mm Unloaded: 10/15/21 By: mm

- Samples were received via? USPS Fed Ex UPS DHL PDX Courier Hand Delivered
 - Samples were received in: (circle) Cooler Box Envelope Other NA
 - Were custody seals on coolers? NA Y N If yes, how many and where? Top
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N
 - Was a Temperature Blank present in cooler? NA Y N If yes, notate the temperature in the appropriate column below:
 If no, take the temperature of a representative sample bottle contained within the cooler; notate in the column "Sample Temp":
 - Were samples received within the method specified temperature ranges? NA Y N
 If no, were they received on ice and same day as collected? If not, notate the cooler # below and notify the PM. NA Y N
- If applicable, tissue samples were received: Frozen Partially Thawed Thawed

Temp Blank	Sample Temp	IR Gun	Cooler #/COC ID / NA	Out of temp indicate with "X"	PM Notified if out of temp	Tracking Number NA	Filed
						9505 5103 8646	
						1285 5051 56	

- Packing material: Inserts Baggies Bubble Wrap Gel Packs Wet Ice Dry Ice Sleeves
- Were custody papers properly filled out (ink, signed, etc.)? NA Y N
- Were samples received in good condition (unbroken) NA Y N
- Were all sample labels complete (ie, analysis, preservation, etc.)? NA Y N
- Did all sample labels and tags agree with custody papers? NA Y N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
- Were the pH-preserved bottles (see SMO GEN SOP) received at the appropriate pH? Indicate in the table below NA Y N
- Were VOA vials received without headspace? Indicate in the table below. NA Y N
- Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, Resolutions: _____



Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
 - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

- * The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
DOD-QSM 4.2 definition : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
 - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses**

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjllabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01970/

Service Request: K2112171

Sample Name: AWL-21-01970-001-4
Lab Code: K2112171-001
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-002-4
Lab Code: K2112171-002
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-003-4
Lab Code: K2112171-003
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-004-4
Lab Code: K2112171-004
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-005-4
Lab Code: K2112171-005
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01970/

Service Request: K2112171

Sample Name: AWL-21-01970-006-4
Lab Code: K2112171-006
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-007-4
Lab Code: K2112171-007
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-008-4
Lab Code: K2112171-008
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-009-4
Lab Code: K2112171-009
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-010-4
Lab Code: K2112171-010
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01970/

Service Request: K2112171

Sample Name: AWL-21-01970-011-4-013-4
Lab Code: K2112171-011
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-012-4
Lab Code: K2112171-012
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.7

Extracted/Digested By
ABOYER

Analyzed By
AMCKORNEY

Sample Name: AWL-21-01970-001-3
Lab Code: K2112171-013
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-001-3
Lab Code: K2112171-013.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-002-3
Lab Code: K2112171-014
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01970/

Service Request: K2112171

Sample Name: AWL-21-01970-002-3
Lab Code: K2112171-014.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-003-3
Lab Code: K2112171-015
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-003-3
Lab Code: K2112171-015.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-004-3
Lab Code: K2112171-016
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-004-3
Lab Code: K2112171-016.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01970/

Service Request: K2112171

Sample Name: AWL-21-01970-005-3
Lab Code: K2112171-017
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-005-3
Lab Code: K2112171-017.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-006-3
Lab Code: K2112171-018
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-006-3
Lab Code: K2112171-018.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-007-3
Lab Code: K2112171-019
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01970/

Service Request: K2112171

Sample Name: AWL-21-01970-007-3
Lab Code: K2112171-019.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-008-3
Lab Code: K2112171-020
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-008-3
Lab Code: K2112171-020.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-009-3
Lab Code: K2112171-021
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-009-3
Lab Code: K2112171-021.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

ALS Group USA, Corp.
dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01970/

Service Request: K2112171

Sample Name: AWL-21-01970-010-3
Lab Code: K2112171-022
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-010-3
Lab Code: K2112171-022.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-011-3-013-3
Lab Code: K2112171-023
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

Sample Name: AWL-21-01970-011-3-013-3
Lab Code: K2112171-023.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN

Sample Name: AWL-21-01970-012-3
Lab Code: K2112171-024
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
EMCALLISTER

ALS Group USA, Corp.

dba ALS Environmental

Analyst Summary report

Client: Alaska Water Laboratories
Project: AWL-21-01970/

Service Request: K2112171

Sample Name: AWL-21-01970-012-3
Lab Code: K2112171-024.R01
Sample Matrix: Water

Date Collected: 10/8/21
Date Received: 10/15/21

Analysis Method
200.8

Extracted/Digested By
ABOYER

Analyzed By
KLINN



Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-001-4
Lab Code: K2112171-001

Service Request: K2112171
Date Collected: 10/08/21 11:00
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	46100	ug/L	42	3	1	10/25/21 09:28	10/20/21	
Magnesium	200.7	17700	ug/L	5.3	0.4	1	10/25/21 09:28	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-002-4
Lab Code: K2112171-002

Service Request: K2112171
Date Collected: 10/08/21 11:05
Date Received: 10/15/21 10:30

Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	72200	ug/L	42	3	1	10/25/21 09:36	10/20/21	
Magnesium	200.7	25300	ug/L	5.3	0.4	1	10/25/21 09:36	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-003-4
Lab Code: K2112171-003

Service Request: K2112171
Date Collected: 10/08/21 12:15
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	39900	ug/L	42	3	1	10/25/21 09:39	10/20/21	
Magnesium	200.7	10000	ug/L	5.3	0.4	1	10/25/21 09:39	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-004-4
Lab Code: K2112171-004

Service Request: K2112171
Date Collected: 10/08/21 10:05
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	15700	ug/L	42	3	1	10/25/21 09:42	10/20/21	
Magnesium	200.7	4000	ug/L	5.3	0.4	1	10/25/21 09:42	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-005-4
Lab Code: K2112171-005

Service Request: K2112171
Date Collected: 10/08/21 08:45
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	14400	ug/L	42	3	1	10/25/21 09:44	10/20/21	
Magnesium	200.7	4550	ug/L	5.3	0.4	1	10/25/21 09:44	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-006-4
Lab Code: K2112171-006

Service Request: K2112171
Date Collected: 10/08/21 08:55
Date Received: 10/15/21 10:30

Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	27100	ug/L	42	3	1	10/25/21 09:55	10/20/21	
Magnesium	200.7	7320	ug/L	5.3	0.4	1	10/25/21 09:55	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-007-4
Lab Code: K2112171-007

Service Request: K2112171
Date Collected: 10/08/21 09:00
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	28100	ug/L	42	3	1	10/25/21 09:58	10/20/21	
Magnesium	200.7	8690	ug/L	5.3	0.4	1	10/25/21 09:58	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-008-4
Lab Code: K2112171-008

Service Request: K2112171
Date Collected: 10/08/21 09:25
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	14200	ug/L	42	3	1	10/25/21 10:01	10/20/21	
Magnesium	200.7	2560	ug/L	5.3	0.4	1	10/25/21 10:01	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-009-4
Lab Code: K2112171-009

Service Request: K2112171
Date Collected: 10/08/21 09:45
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	38300	ug/L	42	3	1	10/25/21 10:03	10/20/21	
Magnesium	200.7	9720	ug/L	5.3	0.4	1	10/25/21 10:03	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-010-4
Lab Code: K2112171-010

Service Request: K2112171
Date Collected: 10/08/21 10:35
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	17500	ug/L	42	3	1	10/25/21 10:06	10/20/21	
Magnesium	200.7	2490	ug/L	5.3	0.4	1	10/25/21 10:06	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-011-4-013-4
Lab Code: K2112171-011

Service Request: K2112171
Date Collected: 10/08/21 11:30
Date Received: 10/15/21 10:30

Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	71700	ug/L	42	3	1	10/25/21 10:09	10/20/21	
Magnesium	200.7	17600	ug/L	5.3	0.4	1	10/25/21 10:09	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-012-4
Lab Code: K2112171-012

Service Request: K2112171
Date Collected: 10/08/21 11:35
Date Received: 10/15/21 10:30
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	71300	ug/L	42	3	1	10/25/21 10:17	10/20/21	
Magnesium	200.7	17400	ug/L	5.3	0.4	1	10/25/21 10:17	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-001-3
Lab Code: K2112171-013

Service Request: K2112171
Date Collected: 10/08/21 11:00
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	3.16	ug/L	0.10	0.05	1	10/29/21 13:20	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-002-3
Lab Code: K2112171-014

Service Request: K2112171
Date Collected: 10/08/21 11:05
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	3.45	ug/L	0.10	0.05	1	10/29/21 13:21	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-003-3
Lab Code: K2112171-015

Service Request: K2112171
Date Collected: 10/08/21 12:15
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	6.04	ug/L	0.10	0.05	1	10/29/21 13:23	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-004-3
Lab Code: K2112171-016

Service Request: K2112171
Date Collected: 10/08/21 10:05
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	7.25	ug/L	0.10	0.05	1	10/29/21 13:24	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-005-3
Lab Code: K2112171-017

Service Request: K2112171
Date Collected: 10/08/21 08:45
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	13.2	ug/L	0.10	0.05	1	10/29/21 13:26	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-006-3
Lab Code: K2112171-018

Service Request: K2112171
Date Collected: 10/08/21 08:55
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	7.17	ug/L	0.10	0.05	1	10/29/21 13:28	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-007-3
Lab Code: K2112171-019

Service Request: K2112171
Date Collected: 10/08/21 09:00
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	7.04	ug/L	0.10	0.05	1	10/29/21 13:29	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-008-3
Lab Code: K2112171-020

Service Request: K2112171
Date Collected: 10/08/21 09:25
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	1.78	ug/L	0.10	0.05	1	10/29/21 13:31	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-009-3
Lab Code: K2112171-021

Service Request: K2112171
Date Collected: 10/08/21 09:45
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	1.59	ug/L	0.10	0.05	1	10/29/21 13:32	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-010-3
Lab Code: K2112171-022

Service Request: K2112171
Date Collected: 10/08/21 10:35
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	9.40	ug/L	0.10	0.05	1	10/29/21 13:37	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-011-3-013-3
Lab Code: K2112171-023

Service Request: K2112171
Date Collected: 10/08/21 11:30
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	4.97	ug/L	0.10	0.05	1	10/29/21 13:39	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: AWL-21-01970-012-3
Lab Code: K2112171-024

Service Request: K2112171
Date Collected: 10/08/21 11:35
Date Received: 10/15/21 10:30
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	5.08	ug/L	0.10	0.05	1	10/29/21 13:43	10/28/21	



QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com



Metals

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: KQ2120553-03

Service Request: K2112171
Date Collected: NA
Date Received: NA
Basis: NA

Total Metals

Analyte Name	Analysis Method	Result	Units	MRL	MDL	Dil.	Date Analyzed	Date Extracted	Q
Calcium	200.7	5 J	ug/L	21	3	1	10/25/21 09:09	10/20/21	
Magnesium	200.7	ND U	ug/L	5.3	0.4	1	10/25/21 09:09	10/20/21	

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water
Sample Name: Method Blank
Lab Code: KQ2121204-07

Service Request: K2112171
Date Collected: NA
Date Received: NA
Basis: NA

Dissolved Metals

<u>Analyte Name</u>	<u>Analysis Method</u>	<u>Result</u>	<u>Units</u>	<u>MRL</u>	<u>MDL</u>	<u>Dil.</u>	<u>Date Analyzed</u>	<u>Date Extracted</u>	<u>Q</u>
Copper	200.8	ND U	ug/L	0.10	0.05	1	10/29/21 12:59	10/28/21	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171
Date Collected: 10/08/21
Date Received: 10/15/21
Date Analyzed: 10/25/21
Date Extracted: 10/20/21

Matrix Spike Summary
Total Metals

Sample Name: AWL-21-01970-011-4-013-4
Lab Code: K2112171-011
Analysis Method: 200.7
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2120553-01

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	71700	81300	10000	96 #	70-130
Magnesium	17600	27900	10000	103	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171
Date Collected: 10/08/21
Date Received: 10/15/21
Date Analyzed: 10/25/21
Date Extracted: 10/20/21

Matrix Spike Summary
Total Metals

Sample Name: AWL-21-01970-001-4
Lab Code: K2112171-001
Analysis Method: 200.7
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2120553-07

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Calcium	46100	55900	10000	98 #	70-130
Magnesium	17700	27800	10000	101	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171
Date Collected: 10/08/21
Date Received: 10/15/21
Date Analyzed: 10/29/21
Date Extracted: 10/28/21

Matrix Spike Summary
Dissolved Metals

Sample Name: AWL-21-01970-011-3-013-3
Lab Code: K2112171-023
Analysis Method: 200.8
Prep Method: EPA CLP ILM04.0

Units: ug/L
Basis: NA

Matrix Spike
KQ2121204-01

<u>Analyte Name</u>	<u>Sample Result</u>	<u>Result</u>	<u>Spike Amount</u>	<u>% Rec</u>	<u>% Rec Limits</u>
Copper	4.97	16.9	12.5	96	70-130

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Matrix Spike and Matrix Spike Duplicate Data is presented for information purposes only. The matrix may or may not be relevant to samples reported in this report. The laboratory evaluates system performance based on the LCS and LCSD control limits.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171
Date Collected: 10/08/21
Date Received: 10/15/21
Date Analyzed: 10/25/21

Replicate Sample Summary

Total Metals

Sample Name: AWL-21-01970-011-4-013-4
Lab Code: K2112171-011

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2120553-05 Result			
Calcium	200.7	42	3	71700	71400	71600	<1	20
Magnesium	200.7	5.3	0.4	17600	17300	17500	2	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171
Date Collected: 10/08/21
Date Received: 10/15/21
Date Analyzed: 10/25/21

Replicate Sample Summary

Total Metals

Sample Name: AWL-21-01970-001-4
Lab Code: K2112171-001

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2120553-06 Result			
Calcium	200.7	42	3	46100	47200	46700	2	20
Magnesium	200.7	5.3	0.4	17700	17900	17800	1	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171
Date Collected: 10/08/21
Date Received: 10/15/21
Date Analyzed: 10/29/21

Replicate Sample Summary
Dissolved Metals

Sample Name: AWL-21-01970-011-3-013-3
Lab Code: K2112171-023

Units: ug/L
Basis: NA

Analyte Name	Analysis Method	MRL	MDL	Sample Result	Duplicate Sample	Average	RPD	RPD Limit
					KQ2121204-03 Result			
Copper	200.8	0.10	0.05	4.97	5.18	5.08	4	20

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171
Date Analyzed: 10/25/21

Lab Control Sample Summary
Total Metals

Units:ug/L
Basis:NA

Lab Control Sample
KQ2120553-04

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Calcium	200.7	12600	12500	100	85-115
Magnesium	200.7	13100	12500	105	85-115

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client: Alaska Water Laboratories
Project: AWL-21-01970
Sample Matrix: Water

Service Request: K2112171

Date Analyzed: 10/29/21

Lab Control Sample Summary
Dissolved Metals

Units:ug/L

Basis:NA

Lab Control Sample

KQ2121204-08

Analyte Name	Analytical Method	Result	Spike Amount	% Rec	% Rec Limits
Copper	200.8	12.5	12.5	100	85-115



Laboratory Report of Analysis

To: Alaska Water Laboratories LLC.
281 N. Main Street Ste 101
Wasilla, AK 99654
907-373-6130

Report Number: **1216736**

Client Project: **AWL-21-01970**

Dear Mary Curry,

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 SGS 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.

Stephen C. Ede

2021.10.25

15:03:05 -08'00'

SGS Anchorage
Project Manager
ENV.ALASKA.PROJMAN@sgs.com

Date

Print Date: 10/25/2021 2:23:56PM

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: **Alaska Water Laboratories LLC.**

SGS Project: **1216736**

Project Name/Site: **AWL-21-01970**

Project Contact: **Mary Curry**

Refer to sample receipt form for information on sample condition.

AWL-21-01970-003 (1216736001) PS

8270D SIM - PAH surrogate recoveries for fluoranthene-d10 and 2-methylnaphthalene-d10 do not meet QC criteria. The sample was re-extracted outside of hold to confirm results and results are comparable. In-hold data is reported.

AWL-21-01970-012 (1216736005) PS

8270D SIM - PAH BMSD recoveries for all analytes and surrogates do not meet QC criteria. The PS/BMS/BMSD were re-extracted outside of hold to confirm and the re-extracted recoveries met criteria. In-hold data is reported.

AWL-21-01970...(1216736005BMS) (1216736006) BMS

8270D SIM - PAH BMSD recoveries for all analytes and surrogates do not meet QC criteria. The PS/BMS/BMSD were re-extracted outside of hold to confirm and the re-extracted recoveries met criteria. In-hold data is reported.

AWL-21-0197...(1216736005BMSD) (1216736007) BMSD

8270D SIM - PAH surrogate recoveries for 2-methylnaphthalene-d10 and fluoranthene-d10 do not meet QC criteria. The sample was re-extracted outside of hold to confirm results and re-extraction met criteria. In-hold data is reported.

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

8270D SIM - PAH BMS/BMSD RPD's for all analytes do not meet QC criteria. These analytes were not detected above the LOQ in the parent sample.

1216736005(1642735MSD) (1642029) MSD

8270D SIM - PAH surrogate recoveries for fluoranthene-d10 and 2-methylnaphthalene-d10 do not meet QC criteria.

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

8270D SIM - PAH BMS/BMSD RPD's for all analytes do not meet QC criteria. These analytes were not detected above the LOQ 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) LV				
1216736002	AWL-21-01970-005	XMS12953	Chrysene	RP
1216736003	AWL-21-01970-008	XMS12953	Benzo[k]fluoranthene	RP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Print Date: 10/25/2021 2:23:59PM

Laboratory Qualifiers

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

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

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

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

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

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

Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
AWL-21-01970-003	1216736001	10/08/2021	10/11/2021	Water (Surface, Eff., Ground)
AWL-21-01970-005	1216736002	10/08/2021	10/11/2021	Water (Surface, Eff., Ground)
AWL-21-01970-008	1216736003	10/08/2021	10/11/2021	Water (Surface, Eff., Ground)
AWL-21-01970-011	1216736004	10/08/2021	10/11/2021	Water (Surface, Eff., Ground)
AWL-21-01970-012	1216736005	10/08/2021	10/11/2021	Water (Surface, Eff., Ground)
AWL-21-01970...(1216736005BM	1216736006	10/08/2021	10/11/2021	Water (Surface, Eff., Ground)
AWL-21-0197...(1216736005BMS	1216736007	10/08/2021	10/11/2021	Water (Surface, Eff., Ground)
AWL-21-01970-014	1216736008	10/08/2021	10/11/2021	Water (Surface, Eff., Ground)

Method

EPA 602/624
EPA 625M SIM (PAH) LV

Method Description

602 Aromatics by 624 (W)
625 PAH SIM GC/MS Low Volume

Detectable Results Summary

Client Sample ID: **AWL-21-01970-003**

Lab Sample ID: 1216736001

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Phenanthrene	0.0159J	ug/L

Client Sample ID: **AWL-21-01970-005**

Lab Sample ID: 1216736002

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[g,h,i]perylene	0.0467J	ug/L
Chrysene	0.0194J	ug/L
Fluoranthene	0.0662	ug/L
Naphthalene	0.0466J	ug/L
Phenanthrene	0.0760	ug/L
Pyrene	0.103	ug/L
Toluene	0.512J	ug/L

Volatile GC/MS

Client Sample ID: **AWL-21-01970-008**

Lab Sample ID: 1216736003

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Acenaphthene	0.0189J	ug/L
Anthracene	0.0591	ug/L
Benzo(a)Anthracene	0.404	ug/L
Benzo[a]pyrene	0.585	ug/L
Benzo[b]Fluoranthene	0.879	ug/L
Benzo[g,h,i]perylene	0.530	ug/L
Benzo[k]fluoranthene	0.310	ug/L
Chrysene	0.582	ug/L
Dibenzo[a,h]anthracene	0.113	ug/L
Fluoranthene	1.03	ug/L
Fluorene	0.0211J	ug/L
Indeno[1,2,3-c,d] pyrene	0.434	ug/L
Naphthalene	0.0319J	ug/L
Phenanthrene	0.358	ug/L
Pyrene	0.864	ug/L

Client Sample ID: **AWL-21-01970-011**

Lab Sample ID: 1216736004

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[g,h,i]perylene	0.0205J	ug/L
Fluoranthene	0.0350J	ug/L
Naphthalene	0.0560J	ug/L
Phenanthrene	0.0441J	ug/L
Pyrene	0.0481J	ug/L
o-Xylene	0.966J	ug/L
P & M -Xylene	2.05	ug/L
Toluene	2.77	ug/L

Volatile GC/MS

Print Date: 10/25/2021 2:24:03PM

Detectable Results Summary

Client Sample ID: **AWL-21-01970-012**

Lab Sample ID: 1216736005

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzo[g,h,i]perylene	0.0221J	ug/L
Fluoranthene	0.0303J	ug/L
Naphthalene	0.0497J	ug/L
Phenanthrene	0.0430J	ug/L
Pyrene	0.0462J	ug/L
o-Xylene	0.932J	ug/L
P & M -Xylene	1.96J	ug/L
Toluene	2.69	ug/L

Volatile GC/MS

Print Date: 10/25/2021 2:24:03PM



Results of **AWL-21-01970-003**

Client Sample ID: **AWL-21-01970-003**
Client Project ID: **AWL-21-01970**
Lab Sample ID: 1216736001
Lab Project ID: 1216736

Collection Date: 10/08/21 12:15
Received Date: 10/11/21 14:12
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Acenaphthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Acenaphthylene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Anthracene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Benzo(a)Anthracene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Benzo[a]pyrene	0.0102 U	0.0204	0.00633	ug/L	1		10/15/21 19:44
Benzo[b]Fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Benzo[g,h,i]perylene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Benzo[k]fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Chrysene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Dibenzo[a,h]anthracene	0.0102 U	0.0204	0.00633	ug/L	1		10/15/21 19:44
Fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Fluorene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Indeno[1,2,3-c,d] pyrene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Naphthalene	0.0510 U	0.102	0.0316	ug/L	1		10/15/21 19:44
Phenanthrene	0.0159 J	0.0510	0.0153	ug/L	1		10/15/21 19:44
Pyrene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 19:44
Surrogates							
2-Methylnaphthalene-d10 (surr)	26.4	*	42-86	%	1		10/15/21 19:44
Fluoranthene-d10 (surr)	26.8	*	50-97	%	1		10/15/21 19:44

Batch Information

Analytical Batch: XMS12953
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: LAW
Analytical Date/Time: 10/15/21 19:44
Container ID: 1216736001-A

Prep Batch: XXX45722
Prep Method: SW3535A
Prep Date/Time: 10/14/21 06:12
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Results of AWL-21-01970-003

Client Sample ID: **AWL-21-01970-003**
 Client Project ID: **AWL-21-01970**
 Lab Sample ID: 1216736001
 Lab Project ID: 1216736

Collection Date: 10/08/21 12:15
 Received Date: 10/11/21 14:12
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/18/21 02:38
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/18/21 02:38
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/18/21 02:38
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/18/21 02:38
Toluene	0.500 U	1.00	0.310	ug/L	1		10/18/21 02:38
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	81-118		%	1		10/18/21 02:38
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/18/21 02:38
Toluene-d8 (surr)	99.2	89-112		%	1		10/18/21 02:38

Batch Information

Analytical Batch: VMS21288
 Analytical Method: EPA 602/624
 Analyst: JMG
 Analytical Date/Time: 10/18/21 02:38
 Container ID: 1216736001-C

Prep Batch: VXX38043
 Prep Method: SW5030B
 Prep Date/Time: 10/17/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of **AWL-21-01970-005**

Client Sample ID: **AWL-21-01970-005**
Client Project ID: **AWL-21-01970**
Lab Sample ID: 1216736002
Lab Project ID: 1216736

Collection Date: 10/08/21 08:45
Received Date: 10/11/21 14:12
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	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:05
Acenaphthylene	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:05
Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:05
Benzo(a)Anthracene	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:05
Benzo[a]pyrene	0.00945 U	0.0189	0.00585	ug/L	1		10/15/21 20:05
Benzo[b]Fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:05
Benzo[g,h,i]perylene	0.0467 J	0.0472	0.0142	ug/L	1		10/15/21 20:05
Benzo[k]fluoranthene	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:05
Chrysene	0.0194 J	0.0472	0.0142	ug/L	1		10/15/21 20:05
Dibenzo[a,h]anthracene	0.00945 U	0.0189	0.00585	ug/L	1		10/15/21 20:05
Fluoranthene	0.0662	0.0472	0.0142	ug/L	1		10/15/21 20:05
Fluorene	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:05
Indeno[1,2,3-c,d] pyrene	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:05
Naphthalene	0.0466 J	0.0943	0.0292	ug/L	1		10/15/21 20:05
Phenanthrene	0.0760	0.0472	0.0142	ug/L	1		10/15/21 20:05
Pyrene	0.103	0.0472	0.0142	ug/L	1		10/15/21 20:05
Surrogates							
2-Methylnaphthalene-d10 (surr)	48.3	42-86		%	1		10/15/21 20:05
Fluoranthene-d10 (surr)	51.1	50-97		%	1		10/15/21 20:05

Batch Information

Analytical Batch: XMS12953
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: LAW
Analytical Date/Time: 10/15/21 20:05
Container ID: 1216736002-A

Prep Batch: XXX45722
Prep Method: SW3535A
Prep Date/Time: 10/14/21 06:12
Prep Initial Wt./Vol.: 265 mL
Prep Extract Vol: 1 mL

Results of AWL-21-01970-005

Client Sample ID: **AWL-21-01970-005**
 Client Project ID: **AWL-21-01970**
 Lab Sample ID: 1216736002
 Lab Project ID: 1216736

Collection Date: 10/08/21 08:45
 Received Date: 10/11/21 14:12
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/18/21 02:53
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/18/21 02:53
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/18/21 02:53
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/18/21 02:53
Toluene	0.512 J	1.00	0.310	ug/L	1		10/18/21 02:53
Surrogates							
1,2-Dichloroethane-D4 (surr)	99.5	81-118		%	1		10/18/21 02:53
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/18/21 02:53
Toluene-d8 (surr)	100	89-112		%	1		10/18/21 02:53

Batch Information

Analytical Batch: VMS21288
 Analytical Method: EPA 602/624
 Analyst: JMG
 Analytical Date/Time: 10/18/21 02:53
 Container ID: 1216736002-C

Prep Batch: VXX38043
 Prep Method: SW5030B
 Prep Date/Time: 10/17/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of AWL-21-01970-008

Client Sample ID: **AWL-21-01970-008**
 Client Project ID: **AWL-21-01970**
 Lab Sample ID: 1216736003
 Lab Project ID: 1216736

Collection Date: 10/08/21 09:25
 Received Date: 10/11/21 14:12
 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	0.0189 J	0.0472	0.0142	ug/L	1		10/15/21 20:25
Acenaphthylene	0.0236 U	0.0472	0.0142	ug/L	1		10/15/21 20:25
Anthracene	0.0591	0.0472	0.0142	ug/L	1		10/15/21 20:25
Benzo(a)Anthracene	0.404	0.0472	0.0142	ug/L	1		10/15/21 20:25
Benzo[a]pyrene	0.585	0.0189	0.00585	ug/L	1		10/15/21 20:25
Benzo[b]Fluoranthene	0.879	0.0472	0.0142	ug/L	1		10/15/21 20:25
Benzo[g,h,i]perylene	0.530	0.0472	0.0142	ug/L	1		10/15/21 20:25
Benzo[k]fluoranthene	0.310	0.0472	0.0142	ug/L	1		10/15/21 20:25
Chrysene	0.582	0.0472	0.0142	ug/L	1		10/15/21 20:25
Dibenzo[a,h]anthracene	0.113	0.0189	0.00585	ug/L	1		10/15/21 20:25
Fluoranthene	1.03	0.0472	0.0142	ug/L	1		10/15/21 20:25
Fluorene	0.0211 J	0.0472	0.0142	ug/L	1		10/15/21 20:25
Indeno[1,2,3-c,d] pyrene	0.434	0.0472	0.0142	ug/L	1		10/15/21 20:25
Naphthalene	0.0319 J	0.0943	0.0292	ug/L	1		10/15/21 20:25
Phenanthrene	0.358	0.0472	0.0142	ug/L	1		10/15/21 20:25
Pyrene	0.864	0.0472	0.0142	ug/L	1		10/15/21 20:25
Surrogates							
2-Methylnaphthalene-d10 (surr)	68	42-86		%	1		10/15/21 20:25
Fluoranthene-d10 (surr)	57.2	50-97		%	1		10/15/21 20:25

Batch Information

Analytical Batch: XMS12953
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 10/15/21 20:25
 Container ID: 1216736003-A

Prep Batch: XXX45722
 Prep Method: SW3535A
 Prep Date/Time: 10/14/21 06:12
 Prep Initial Wt./Vol.: 265 mL
 Prep Extract Vol: 1 mL

Results of AWL-21-01970-008

Client Sample ID: **AWL-21-01970-008**
 Client Project ID: **AWL-21-01970**
 Lab Sample ID: 1216736003
 Lab Project ID: 1216736

Collection Date: 10/08/21 09:25
 Received Date: 10/11/21 14:12
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/18/21 03:08
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/18/21 03:08
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/18/21 03:08
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/18/21 03:08
Toluene	0.500 U	1.00	0.310	ug/L	1		10/18/21 03:08
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	81-118		%	1		10/18/21 03:08
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/18/21 03:08
Toluene-d8 (surr)	99.9	89-112		%	1		10/18/21 03:08

Batch Information

Analytical Batch: VMS21288
 Analytical Method: EPA 602/624
 Analyst: JMG
 Analytical Date/Time: 10/18/21 03:08
 Container ID: 1216736003-C

Prep Batch: VXX38043
 Prep Method: SW5030B
 Prep Date/Time: 10/17/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL



Results of AWL-21-01970-011

Client Sample ID: **AWL-21-01970-011**
 Client Project ID: **AWL-21-01970**
 Lab Sample ID: 1216736004
 Lab Project ID: 1216736

Collection Date: 10/08/21 11:30
 Received Date: 10/11/21 14:12
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Acenaphthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Acenaphthylene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Anthracene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Benzo(a)Anthracene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Benzo[a]pyrene	0.0102 U	0.0204	0.00633	ug/L	1		10/15/21 20:46
Benzo[b]Fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Benzo[g,h,i]perylene	0.0205 J	0.0510	0.0153	ug/L	1		10/15/21 20:46
Benzo[k]fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Chrysene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Dibenzo[a,h]anthracene	0.0102 U	0.0204	0.00633	ug/L	1		10/15/21 20:46
Fluoranthene	0.0350 J	0.0510	0.0153	ug/L	1		10/15/21 20:46
Fluorene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Indeno[1,2,3-c,d] pyrene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 20:46
Naphthalene	0.0560 J	0.102	0.0316	ug/L	1		10/15/21 20:46
Phenanthrene	0.0441 J	0.0510	0.0153	ug/L	1		10/15/21 20:46
Pyrene	0.0481 J	0.0510	0.0153	ug/L	1		10/15/21 20:46
Surrogates							
2-Methylnaphthalene-d10 (surr)	60.9	42-86		%	1		10/15/21 20:46
Fluoranthene-d10 (surr)	59.9	50-97		%	1		10/15/21 20:46

Batch Information

Analytical Batch: XMS12953
 Analytical Method: EPA 625M SIM (PAH) LV
 Analyst: LAW
 Analytical Date/Time: 10/15/21 20:46
 Container ID: 1216736004-A

Prep Batch: XXX45722
 Prep Method: SW3535A
 Prep Date/Time: 10/14/21 06:12
 Prep Initial Wt./Vol.: 245 mL
 Prep Extract Vol: 1 mL



Results of **AWL-21-01970-011**

Client Sample ID: **AWL-21-01970-011**
Client Project ID: **AWL-21-01970**
Lab Sample ID: 1216736004
Lab Project ID: 1216736

Collection Date: 10/08/21 11:30
Received Date: 10/11/21 14:12
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/18/21 03:23
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/18/21 03:23
o-Xylene	0.966 J	1.00	0.310	ug/L	1		10/18/21 03:23
P & M -Xylene	2.05	2.00	0.620	ug/L	1		10/18/21 03:23
Toluene	2.77	1.00	0.310	ug/L	1		10/18/21 03:23
Surrogates							
1,2-Dichloroethane-D4 (surr)	99.6	81-118		%	1		10/18/21 03:23
4-Bromofluorobenzene (surr)	100	85-114		%	1		10/18/21 03:23
Toluene-d8 (surr)	101	89-112		%	1		10/18/21 03:23

Batch Information

Analytical Batch: VMS21288
Analytical Method: EPA 602/624
Analyst: JMG
Analytical Date/Time: 10/18/21 03:23
Container ID: 1216736004-C

Prep Batch: VXX38043
Prep Method: SW5030B
Prep Date/Time: 10/17/21 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of **AWL-21-01970-012**

Client Sample ID: **AWL-21-01970-012**
Client Project ID: **AWL-21-01970**
Lab Sample ID: 1216736005
Lab Project ID: 1216736

Collection Date: 10/08/21 11:35
Received Date: 10/11/21 14:12
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Acenaphthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Acenaphthylene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Anthracene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Benzo(a)Anthracene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Benzo[a]pyrene	0.0102 U	0.0204	0.00633	ug/L	1		10/15/21 21:06
Benzo[b]Fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Benzo[g,h,i]perylene	0.0221 J	0.0510	0.0153	ug/L	1		10/15/21 21:06
Benzo[k]fluoranthene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Chrysene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Dibenzo[a,h]anthracene	0.0102 U	0.0204	0.00633	ug/L	1		10/15/21 21:06
Fluoranthene	0.0303 J	0.0510	0.0153	ug/L	1		10/15/21 21:06
Fluorene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Indeno[1,2,3-c,d] pyrene	0.0255 U	0.0510	0.0153	ug/L	1		10/15/21 21:06
Naphthalene	0.0497 J	0.102	0.0316	ug/L	1		10/15/21 21:06
Phenanthrene	0.0430 J	0.0510	0.0153	ug/L	1		10/15/21 21:06
Pyrene	0.0462 J	0.0510	0.0153	ug/L	1		10/15/21 21:06
Surrogates							
2-Methylnaphthalene-d10 (surr)	57.8	42-86		%	1		10/15/21 21:06
Fluoranthene-d10 (surr)	57.7	50-97		%	1		10/15/21 21:06

Batch Information

Analytical Batch: XMS12953
Analytical Method: EPA 625M SIM (PAH) LV
Analyst: LAW
Analytical Date/Time: 10/15/21 21:06
Container ID: 1216736005-A

Prep Batch: XXX45722
Prep Method: SW3535A
Prep Date/Time: 10/14/21 06:12
Prep Initial Wt./Vol.: 245 mL
Prep Extract Vol: 1 mL

Results of AWL-21-01970-012

Client Sample ID: **AWL-21-01970-012**
 Client Project ID: **AWL-21-01970**
 Lab Sample ID: 1216736005
 Lab Project ID: 1216736

Collection Date: 10/08/21 11:35
 Received Date: 10/11/21 14:12
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/18/21 00:54
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/18/21 00:54
o-Xylene	0.932 J	1.00	0.310	ug/L	1		10/18/21 00:54
P & M -Xylene	1.96 J	2.00	0.620	ug/L	1		10/18/21 00:54
Toluene	2.69	1.00	0.310	ug/L	1		10/18/21 00:54
Surrogates							
1,2-Dichloroethane-D4 (surr)	100	81-118		%	1		10/18/21 00:54
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/18/21 00:54
Toluene-d8 (surr)	99.5	89-112		%	1		10/18/21 00:54

Batch Information

Analytical Batch: VMS21288
 Analytical Method: EPA 602/624
 Analyst: JMG
 Analytical Date/Time: 10/18/21 00:54
 Container ID: 1216736005-C

Prep Batch: VXX38043
 Prep Method: SW5030B
 Prep Date/Time: 10/17/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Results of AWL-21-01970-014

Client Sample ID: **AWL-21-01970-014**
 Client Project ID: **AWL-21-01970**
 Lab Sample ID: 1216736008
 Lab Project ID: 1216736

Collection Date: 10/08/21 08:45
 Received Date: 10/11/21 14:12
 Matrix: Water (Surface, Eff., Ground)
 Solids (%):
 Location:

Results by Volatile GC/MS

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.200 U	0.400	0.120	ug/L	1		10/17/21 23:55
Ethylbenzene	0.500 U	1.00	0.310	ug/L	1		10/17/21 23:55
o-Xylene	0.500 U	1.00	0.310	ug/L	1		10/17/21 23:55
P & M -Xylene	1.00 U	2.00	0.620	ug/L	1		10/17/21 23:55
Toluene	0.500 U	1.00	0.310	ug/L	1		10/17/21 23:55
Surrogates							
1,2-Dichloroethane-D4 (surr)	101	81-118		%	1		10/17/21 23:55
4-Bromofluorobenzene (surr)	101	85-114		%	1		10/17/21 23:55
Toluene-d8 (surr)	99.8	89-112		%	1		10/17/21 23:55

Batch Information

Analytical Batch: VMS21288
 Analytical Method: EPA 602/624
 Analyst: JMG
 Analytical Date/Time: 10/17/21 23:55
 Container ID: 1216736008-A

Prep Batch: VXX38043
 Prep Method: SW5030B
 Prep Date/Time: 10/17/21 06:00
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Method Blank

Blank ID: MB for HBN 1827302 [VXX/38043]
 Blank Lab ID: 1642906

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1216736001, 1216736002, 1216736003, 1216736004, 1216736005, 1216736008

Results by EPA 602/624

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.200U	0.400	0.120	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.328J	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	102	81-118		%
4-Bromofluorobenzene (surr)	104	85-114		%
Toluene-d8 (surr)	99.7	89-112		%

Batch Information

Analytical Batch: VMS21288
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: JMG
 Analytical Date/Time: 10/17/2021 9:27:00PM

Prep Batch: VXX38043
 Prep Method: SW5030B
 Prep Date/Time: 10/17/2021 6:00:00AM
 Prep Initial Wt./Vol.: 5 mL
 Prep Extract Vol: 5 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1216736 [VXX38043]
 Blank Spike Lab ID: 1642907
 Date Analyzed: 10/17/2021 21:42

Spike Duplicate ID: LCSD for HBN 1216736 [VXX38043]
 Spike Duplicate Lab ID: 1642908
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1216736001, 1216736002, 1216736003, 1216736004, 1216736005, 1216736008

Results by EPA 602/624

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	30	30.2	101	30	29.4	98	(79-120)	2.60	(< 20)
Ethylbenzene	30	29.7	99	30	28.8	96	(79-121)	3.30	(< 20)
o-Xylene	30	29.7	99	30	28.9	96	(78-122)	3.00	(< 20)
P & M -Xylene	60	59.0	98	60	56.9	95	(80-121)	3.60	(< 20)
Toluene	30	30.4	101	30	29.6	99	(80-121)	2.70	(< 20)
Surrogates									
1,2-Dichloroethane-D4 (surr)	30		98	30		98	(81-118)	0.48	
4-Bromofluorobenzene (surr)	30		101	30		100	(85-114)	0.61	
Toluene-d8 (surr)	30		101	30		100	(89-112)	0.52	

Batch Information

Analytical Batch: **VMS21288**
 Analytical Method: **EPA 602/624**
 Instrument: **Agilent 7890-75MS**
 Analyst: **JMG**

Prep Batch: **VXX38043**
 Prep Method: **SW5030B**
 Prep Date/Time: **10/17/2021 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: 1216736005
 MS Sample ID: 1216736006 BMS
 MSD Sample ID: 1216736007 BMSD

Analysis Date: 10/18/2021 0:54
 Analysis Date: 10/18/2021 6:36
 Analysis Date: 10/18/2021 6:51
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 602/624

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.200U	30.0	33.6	112	30.0	32.9	110	79-120	2.00	(< 20)
Ethylbenzene	0.500U	30.0	32.3	108	30.0	31.5	105	79-121	2.50	(< 20)
o-Xylene	0.932J	30.0	33.1	107	30.0	32.5	105	78-122	1.70	(< 20)
P & M -Xylene	1.96J	60.0	65.3	106	60.0	63.8	103	80-121	2.30	(< 20)
Toluene	2.69	30.0	35.1	108	30.0	34.3	105	80-121	2.40	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		30.0	29.4	98	30.0	29.2	98	81-118	0.67	
4-Bromofluorobenzene (surr)		30.0	29.1	97	30.0	29.2	97	85-114	0.25	
Toluene-d8 (surr)		30.0	30.3	101	30.0	30.3	101	89-112	0.10	

Batch Information

Analytical Batch: VMS21288
 Analytical Method: EPA 602/624
 Instrument: Agilent 7890-75MS
 Analyst: JMG
 Analytical Date/Time: 10/18/2021 6:36:00AM

Prep Batch: VXX38043
 Prep Method: Volatiles Extraction 8240/8260 FULL
 Prep Date/Time: 10/17/2021 6:00:00AM
 Prep Initial Wt./Vol.: 5.00mL
 Prep Extract Vol: 5.00mL

Method Blank

Blank ID: MB for HBN 1827031 [XXX/45722]
 Blank Lab ID: 1642026

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
 1216736001, 1216736002, 1216736003, 1216736004, 1216736005

Results by EPA 625M SIM (PAH) LV

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0234J	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Methylnaphthalene-d10 (surr)	47.7	42-86		%
Fluoranthene-d10 (surr)	65.3	50-97		%

Batch Information

Analytical Batch: XMS12953
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: LAW
 Analytical Date/Time: 10/15/2021 5:21:00PM

Prep Batch: XXX45722
 Prep Method: SW3535A
 Prep Date/Time: 10/14/2021 6:12:09AM
 Prep Initial Wt./Vol.: 250 mL
 Prep Extract Vol: 1 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1216736 [XXX45722]

Blank Spike Lab ID: 1642027

Date Analyzed: 10/15/2021 17:41

Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1216736001, 1216736002, 1216736003, 1216736004, 1216736005

Results by EPA 625M SIM (PAH) LV

Blank Spike (ug/L)

Parameter	Spike	Result	Rec (%)	CL
Acenaphthene	2	1.41	71	(48-114)
Acenaphthylene	2	1.43	71	(35-121)
Anthracene	2	1.52	76	(53-119)
Benzo(a)Anthracene	2	1.45	73	(59-120)
Benzo[a]pyrene	2	1.59	79	(53-120)
Benzo[b]Fluoranthene	2	1.52	76	(53-126)
Benzo[g,h,i]perylene	2	1.73	87	(44-128)
Benzo[k]fluoranthene	2	1.59	80	(54-125)
Chrysene	2	1.54	77	(57-120)
Dibenzo[a,h]anthracene	2	1.75	87	(44-131)
Fluoranthene	2	1.44	72	(58-120)
Fluorene	2	1.45	73	(50-118)
Indeno[1,2,3-c,d] pyrene	2	1.71	85	(48-130)
Naphthalene	2	1.21	61	(43-114)
Phenanthrene	2	1.53	77	(53-115)
Pyrene	2	1.48	74	(53-121)

Surrogates

2-Methylnaphthalene-d10 (surr)	2		53	(42-86)
Fluoranthene-d10 (surr)	2		64	(50-97)

Batch Information

Analytical Batch: XMS12953

Analytical Method: EPA 625M SIM (PAH) LV

Instrument: SVA Agilent 780/5975 GC/MS

Analyst: LAW

Prep Batch: XXX45722

Prep Method: SW3535A

Prep Date/Time: 10/14/2021 06:12

Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Dupe Init Wt./Vol.: Extract Vol:

Matrix Spike Summary

Original Sample ID: 1642735
 MS Sample ID: 1642028 MS
 MSD Sample ID: 1642029 MSD

Analysis Date: 10/15/2021 21:06
 Analysis Date: 10/15/2021 21:27
 Analysis Date: 10/15/2021 21:47
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1216736001, 1216736002, 1216736003, 1216736004, 1216736005

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0255U	2.00	1.34	67	2.00	0.386	19	* 48-114	110.00	* (< 20)
Acenaphthylene	0.0255U	2.00	1.39	69	2.00	0.409	21	* 35-121	109.00	* (< 20)
Anthracene	0.0255U	2.00	1.34	67	2.00	0.408	20	* 53-119	107.00	* (< 20)
Benzo(a)Anthracene	0.0255U	2.00	1.33	67	2.00	0.422	21	* 59-120	104.00	* (< 20)
Benzo[a]pyrene	0.0102U	2.00	1.44	72	2.00	0.420	21	* 53-120	110.00	* (< 20)
Benzo[b]Fluoranthene	0.0255U	2.00	1.47	74	2.00	0.432	22	* 53-126	109.00	* (< 20)
Benzo[g,h,i]perylene	0.0221J	2.00	1.41	69	2.00	0.395	19	* 44-128	112.00	* (< 20)
Benzo[k]fluoranthene	0.0255U	2.00	1.38	69	2.00	0.414	21	* 54-125	108.00	* (< 20)
Chrysene	0.0255U	2.00	1.33	67	2.00	0.431	22	* 57-120	102.00	* (< 20)
Dibenzo[a,h]anthracene	0.0102U	2.00	1.44	72	2.00	0.405	20	* 44-131	112.00	* (< 20)
Fluoranthene	0.0303J	2.00	1.28	62	2.00	0.429	20	* 58-120	99.50	* (< 20)
Fluorene	0.0255U	2.00	1.34	67	2.00	0.392	20	* 50-118	109.00	* (< 20)
Indeno[1,2,3-c,d] pyrene	0.0255U	2.00	1.43	71	2.00	0.400	20	* 48-130	112.00	* (< 20)
Naphthalene	0.0497J	2.00	1.33	64	2.00	0.374	16	* 43-114	112.00	* (< 20)
Phenanthrene	0.0430J	2.00	1.35	65	2.00	0.429	19	* 53-115	103.00	* (< 20)
Pyrene	0.0462J	2.00	1.31	63	2.00	0.439	20	* 53-121	99.40	* (< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		2.00	1.09	54	2.00	0.276	14	* 42-86	119.00	
Fluoranthene-d10 (surr)		2.00	1.1	55	2.00	0.371	19	* 50-97	98.90	

Batch Information

Analytical Batch: XMS12953
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: LAW
 Analytical Date/Time: 10/15/2021 9:27:00PM

Prep Batch: XXX45722
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 10/14/2021 6:12:09AM
 Prep Initial Wt./Vol.: 250.00mL
 Prep Extract Vol: 1.00mL



Billable Matrix Spike Summary

Original Sample ID: 1216736005
 MS Sample ID: 1216736006 BMS
 MSD Sample ID: 1216736007 BMSD

Analysis Date: 10/15/2021 21:06
 Analysis Date: 10/15/2021 21:27
 Analysis Date: 10/15/2021 21:47
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

Results by EPA 625M SIM (PAH) LV

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Acenaphthene	0.0255U	2.00	1.34	67	2.00	0.386	19	* 48-114	110.00	* (< 20)
Acenaphthylene	0.0255U	2.00	1.39	69	2.00	0.409	21	* 35-121	109.00	* (< 20)
Anthracene	0.0255U	2.00	1.34	67	2.00	0.408	20	* 53-119	107.00	* (< 20)
Benzo(a)Anthracene	0.0255U	2.00	1.33	67	2.00	0.422	21	* 59-120	104.00	* (< 20)
Benzo[a]pyrene	0.0102U	2.00	1.44	72	2.00	0.420	21	* 53-120	110.00	* (< 20)
Benzo[b]Fluoranthene	0.0255U	2.00	1.47	74	2.00	0.432	22	* 53-126	109.00	* (< 20)
Benzo[g,h,i]perylene	0.0221J	2.00	1.41	69	2.00	0.395	19	* 44-128	112.00	* (< 20)
Benzo[k]fluoranthene	0.0255U	2.00	1.38	69	2.00	0.414	21	* 54-125	108.00	* (< 20)
Chrysene	0.0255U	2.00	1.33	67	2.00	0.431	22	* 57-120	102.00	* (< 20)
Dibenzo[a,h]anthracene	0.0102U	2.00	1.44	72	2.00	0.405	20	* 44-131	112.00	* (< 20)
Fluoranthene	0.0303J	2.00	1.28	62	2.00	0.429	20	* 58-120	99.50	* (< 20)
Fluorene	0.0255U	2.00	1.34	67	2.00	0.392	20	* 50-118	109.00	* (< 20)
Indeno[1,2,3-c,d] pyrene	0.0255U	2.00	1.43	71	2.00	0.400	20	* 48-130	112.00	* (< 20)
Naphthalene	0.0497J	2.00	1.33	64	2.00	0.374	16	* 43-114	112.00	* (< 20)
Phenanthrene	0.0430J	2.00	1.35	65	2.00	0.429	19	* 53-115	103.00	* (< 20)
Pyrene	0.0462J	2.00	1.31	63	2.00	0.439	20	* 53-121	99.40	* (< 20)
Surrogates										
2-Methylnaphthalene-d10 (surr)		2.00	1.09	54	2.00	0.276	14	* 42-86	119.00	
Fluoranthene-d10 (surr)		2.00	1.1	55	2.00	0.371	19	* 50-97	98.90	

Batch Information

Analytical Batch: XMS12953
 Analytical Method: EPA 625M SIM (PAH) LV
 Instrument: SVA Agilent 780/5975 GC/MS
 Analyst: LAW
 Analytical Date/Time: 10/15/2021 9:27:00PM

Prep Batch: XXX45722
 Prep Method: 3535 Solid Phase Ext for 8270 PAH SIM LV
 Prep Date/Time: 10/14/2021 6:12:09AM
 Prep Initial Wt./Vol.: 250.00mL
 Prep Extract Vol: 1.00mL

Print Date: 10/25/2021 2:24:16PM

1216736

FROM: Alaska Water Laboratories LLC.
281 N. Main St, STE101
Wasilla AK 99654
Mary@AkWaterLabs.com

Sub-Contracted Lab:



Client Project Name: AWL-21-01970

Certification Required: Wastewater

Requested Due Date (if not standard TAT): Standard

*edd, report to MDL;
DUP, MS/MSD
volume included for batch

Samples

AWL ID	Collection Date/ Time	Analysis	Comments	Matrix
UAE AWL-21-01970-003	10/8/2021 12:15	624 TAH	VOA vials	WW
AWL-21-01970-003	10/8/2021 12:15	625 M PAH	2 containers	WW
UAE AWL-21-01970-005	10/8/2021 8:45	624 TAH	2 VOA vials	WW
UAE AWL-21-01970-005	10/8/2021 8:45	625 M PAH	2 AG Cont.	WW
SAC AWL-21-01970-008	10/8/2021 9:25	624 TAH	3 VOA vials	WW
AWL-21-01970-008	10/8/2021 9:25	625 M PAH	2 AG Cont.	WW
UAE AWL-21-01970-011	10/8/2021 11:30	624 TAH	1 VOA vial	WW
UAE AWL-21-01970-011	10/8/2021 11:30	625 M PAH	2 AG Cont.	WW
SAC AWL-21-01970-012	10/8/2021 11:35	624 TAH	VOA Vials; DUP VOL	WW
SAC AWL-21-01970-012	10/8/2021 11:35	625 M PAH	DUP VOL 2 AG Cont.	WW
G7AE AWL-21-01970-013	10/8/2021 11:40	624 TAH	VOA Vials; MS/MSD VOL	WW
AWL-21-01970-013	10/8/2021 11:40	625 M PAH	MS/MSD VOL 2 AG Cont.	WW
SAC AWL-21-01970-014	10/8/2021 8:45	624 TAH	VOA Vials; TRIP BLANKS	WW

Relinquished By: mcc	Date&Time: 10/11/2021 09:22	Received By: 	Date&Time:	Temp:
				CoC Seal? Y / N
Relinquished By:	Date&Time:	Received By: 	Date&Time: 14:12 10/11/21	Temp:
				CoC Seal? Y / (N)

#3696689AD

-1.0 D65

Absent

RUSH RT

No. 142372

ALASKA NORTHERN COURIER

PMB 201, 1120 HUFFMAN RD., SUITE #24

ANCHORAGE, ALASKA 99515-3561

(907) 349-7699 FAX (907) 349-7698

ANC@ALASKA.NET

Pick Up From: AVL Date: 11 11 11

Time: 11:00

Req. By: 11:00

Courier: _____

VC/MC#: _____

Exp. Date: _____ JOB/PO.# _____

Authorized Sig.: _____

Deliver To:	Charge
<u>1120 Huffman Rd</u>	
Print Name Here:	Time: <u>11:00</u>
<u>1120 Huffman Rd</u>	



e-Sample Receipt Form

SGS Workorder #:

1216736

1216736

Review Criteria		Condition (Yes, No, N/A)	Exceptions Noted below	
Chain of Custody / Temperature Requirements		N/A	Exemption permitted if sampler hand carries/delivers.	
Were Custody Seals intact? Note # & location	Yes	1B		
COC accompanied samples?	Yes			
DOD: Were samples received in COC corresponding coolers?	N/A			
<input type="checkbox"/> N/A **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required Temperature blank compliant* (i.e., 0-6 °C after CF)?		No	Cooler ID: 1	@ -1.0 °C Therm. ID: D65
If samples received without a temperature blank, the "cooler temperature" will be documented instead & "COOLER TEMP" will be noted to the right. "ambient" or "chilled" will be noted if neither is available.		N/A	Cooler ID:	@ °C Therm. ID:
			Cooler ID:	@ °C Therm. ID:
			Cooler ID:	@ °C Therm. ID:
			Cooler ID:	@ °C Therm. ID:
*if >6°C, were samples collected <8 hours ago?		N/A		
If <0°C, were sample containers ice free?		Yes		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.				
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.		
Were samples received within holding time?		Yes		
Do samples match COC** (i.e., sample IDs, dates/times collected)? **Note: If times differ <1hr, record details & login per COC. ***Note: If sample information on containers differs from COC, SGS will default to COC information		No	Sample 3 only has 1 VOA vial despite saying 3 per COC. PM notified.	
Were analytical requests clear? (i.e., method is specified for analyses with multiple option for analysis (Ex: BTEX, Metals))		Yes		
Were proper containers (type/mass/volume/preservative***) used?		Yes	N/A	***Exemption permitted for metals (e.g, 200.8/6020B).
Volatile / LL-Hg Requirements				
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?		Yes		
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?		Yes		
Were all soil VOAs field extracted with MeOH+BFB?		N/A		
Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.				
Additional notes (if applicable):				



Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1216736001-A	No Preservative Required	OK			
1216736001-B	No Preservative Required	OK			
1216736001-C	HCL to pH < 2	OK			
1216736001-D	HCL to pH < 2	OK			
1216736001-E	HCL to pH < 2	OK			
1216736002-A	No Preservative Required	OK			
1216736002-B	No Preservative Required	OK			
1216736002-C	HCL to pH < 2	OK			
1216736002-D	HCL to pH < 2	OK			
1216736002-E	HCL to pH < 2	OK			
1216736003-A	No Preservative Required	OK			
1216736003-B	No Preservative Required	OK			
1216736003-C	HCL to pH < 2	OK			
1216736004-A	No Preservative Required	OK			
1216736004-B	No Preservative Required	OK			
1216736004-C	HCL to pH < 2	OK			
1216736004-D	HCL to pH < 2	OK			
1216736004-E	HCL to pH < 2	OK			
1216736005-A	No Preservative Required	OK			
1216736005-B	No Preservative Required	OK			
1216736005-C	HCL to pH < 2	OK			
1216736005-D	HCL to pH < 2	OK			
1216736005-E	HCL to pH < 2	OK			
1216736006-A	No Preservative Required	OK			
1216736006-B	No Preservative Required	OK			
1216736006-C	HCL to pH < 2	OK			
1216736006-D	HCL to pH < 2	OK			
1216736006-E	HCL to pH < 2	OK			
1216736007-A	No Preservative Required	OK			
1216736007-B	No Preservative Required	OK			
1216736007-C	HCL to pH < 2	OK			
1216736007-D	HCL to pH < 2	OK			
1216736007-E	HCL to pH < 2	OK			
1216736008-A	HCL to pH < 2	OK			
1216736008-B	HCL to pH < 2	OK			
1216736008-C	HCL to pH < 2	OK			

Container Id

Preservative

Container
Condition

Container Id

Preservative

Container
Condition

Container Condition Glossary

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

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

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

DM - The container was received damaged.

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

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

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

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

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

QN - Insufficient sample quantity provided.



Alaska Water Laboratories
281 N Main st, Suite # 101
Wasilla, AK 99654
907-373-6130

AWL Chain of Custody
Custody form MUST be signed
Please provide as much information as possible



AWL-21- 01970

Sampling Event ID:

Client/Company Name & Address: HDR Inc. 2525 C St. Suite 500 Anchorage, AK 99503		Public Water System (PWS) ID: Project Name: MOA Stormwater Monitoring		Section To Be Completed by AWL Quote Number: _____ Account: _____ Invoice Contact Name & Address & Phone: HDR Inc. Calley Hall 2525 C St. Suite 500, Anchorage, AK 99503 907.644.2048								
Turnaround Time (TAT) for Results <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited (prior arrangement required) *10 days please specify due date below; additional charges may apply		Requested Date for Results: Results to STATE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Routine <input type="checkbox"/> Non-Routine		PO/Contract No.: 10314109, Task 1								
Special Instructions/Requirements: _____		Requested Analysis/Method 01 02 03										
Kit Preparation/Shipping Charge:	Client Sample Identification (Name, Designation, Location, etc.)	Date Sampled	Time Sampled	Matrix	No. of Containers	Request #				Comments		
						5210B - BOD	2540D - Total Suspended Solids	9222D - Fecal Coliform Preserv.: Na2S04	200.8 - Dissolved Cu (Lab Filter)		EPA 200.8/2340B - Total Hardness: HNO3	EPA 625 SIM - TAqH
1 SWM 03-04	001	10/18/21	11:00	WS	4	X	X	X	X	X	X	
2 SWM 04-04	002		11:05	WS	4	X	X	X	X	X	X	
3 SWM 05-04	003		12:15	WS	9	X	X	X	X	X	X	
4 SWM 06-04	004		10:05	WS	4	X	X	X	X	X	X	
5 SWM 07-04	005		8:45	WS	4	X	X	X	X	X	X	
6 SWM 08-04	006		8:55	WS	4	X	X	X	X	X	X	
7 SWM 08-04 Dup	007		9:00	WS	4	X	X	X	X	X	X	
8 SWM 09-04	008		9:25	WS	9	X	X	X	X	X	X	
9 SWM 10-04	009		9:45	WS	4	X	X	X	X	X	X	
10 SWM 11-04	010		10:35	WS	4	X	X	X	X	X	X	
Relinquished by: Tracy Spillars		Date	Time	Received by: MJL		Date	Time	Section To Be Completed by AWL Condition of Custody Seal: Intact Broken Receiving location: AHL		Temperature on arrival: (TAH, PAH) 05, 07, 09, 12 = 4.98 °C 09-02 = 3.48 °C 03-08 = 1.48 °C		
Relinquished by: _____		Date	Time	Received by: _____		Date	Time	Thermometer ID # <u>IRT</u> Measurement method: <u>Temp Blank</u> Other: _____ Shipping method/Tracking number: _____		Name of Sampler: (printed) Kay Grandhauer		



AWL Chain of Custody

Custody form **MUST** be signed

Please provide as much information as possible

Alaska Water Laboratories
281 N Main st, Suite # 101
Wasilla, AK 99654
907-373-6130

Sampling Event ID:

Client/Company Name & Address: HDR Inc. 2525 C St. Suite 500 Anchorage, AK 99503		Public Water System (PWS) ID: Project Name: MOA Stormwater Monitoring	
Contact Person: Cindy Helmericks Phone No.: 907.644-2017 Fax No.: --- E-mail: cindy.helmericks@hdrinc.com		Section To Be Completed by AWL Quote Number: _____ SDG: _____ Account: _____ Check: _____ Credit: _____	
Requested Date for Results: <input checked="" type="checkbox"/> Standard <input type="checkbox"/> Expedited (prior authorization required) to _____ days please specify due date below; additional charges may apply		Invoice Contact Name & Address & Phone: HDR Inc. Calley Hall 2525 C St. Suite 500, Anchorage, AK 99503 907.644.2048	
Results to STATE: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Routine <input type="checkbox"/> Non-Routine		PO/Contract No.: 10314109, Task 1	
Special Instructions/Requirements:			

Kit Preparation/Shipping Charge:	Client Sample Identification (Name, Designation, Location, etc.)	Date Sampled	Time Sampled	Matrix	No. of Containers	Requested Analysis/Method						Comments	
						2540D - Total Suspended Solids	9222D - Fecal Coliform Preserv.: Na2SO4	200.8 - Dissolved Cu (Lab Filter)	EPA 200.8/2340B - Total Hardness Preservative: HNO3	EPA 625 SIM - TAqH	EPA 624 - TAH Preservative: HCl		
11 SWM 12-04	U11	10/8/21	11:36	WS	9	2	2	2	2	2	2		
12 SWM 12-04 Dup	012	↓	11:35	WS	9	2	2	2	2	2	2		
13 SWM 12-04	017	↓	11:46	WS	16	2	2	2	2	2	2		MS/MSD
14 SWM TripBlank-04			11:36	WS	3								Trip Blanks (3)
15				WS									
16				WS									
17				WS									
18				WS									
19				WS									
20				WS									

Relinquished by: <i>Larry Helmericks</i>		Date	Time	Received by:	Date	Time
		10/18/21	14:00	<i>MJH</i>	10-8-21	14:00
Relinquished by:		Date	Time	Received by:	Date	Time
Relinquished by:		Date	Time	Received by:	Date	Time
Name of Sampler: (printed)		Section To Be Completed by AWL				
		Condition of Custody Seal: Intact		Broken		Absent
		Receiving location: _____		Temperature on arrival: _____ °C		_____ °C
		Thermometer ID # _____		Measurement method: _____		Temp Blank Other
		Shipping method/Tracking number: _____				



Appendix D

Field & Laboratory Data Validation



This page intentionally left blank.

Data review focused on the following quality control (QC) parameters and their overall effects on the data:

- Physical parameter replicate comparisons
- Sample handling and holding time compliance
- Field replicate comparison for conventional and organic constituents
- Comparisons of laboratory controls (e.g., matrix spike/matrix spike duplicates).

1. Physical Parameter Comparisons

Precipitation

Precipitation was measured at four project locations within the Anchorage basin using tipping bucket rain gauges. Daily rainfall data from the PANC weather station at the AIA were used to supplement the four project rain gauges.

The study plan specifies that storm events must meet the following criteria: a storm event must be ≥ 0.1 inch of rain in 24 hours (hr) and be preceded by 24 hr of dry weather (< 0.1 inch of rain). These criteria were applied on a 24-hr storm basis rather than a calendar basis since storms often commence in late evening the day before sampling. All four storm events met the criteria of exhibiting ≥ 0.1 inch of rain in 24 hr. Total rainfall as measured at PANC and the four tipping bucket stations in the monitoring area during each monitored event ranged from a low of 0.01 inches at Spencer during the fourth event to 1.23 inches at Lynwood during the third event. In all storm events, sampling was completed within 24 hours from the start of a storm. In all sampling events, precipitation recorded at all four project gauges during the preceding 24-hr period was < 0.1 inches except for the first storm at Lynwood and Spencer both located on the southern portion of the study corridor. Storm events during the 2021 storm season were noted as being variable across the Anchorage Bowl and in some cases storms were located to a small portion of the study corridor. The sampling events were triggered based on the mesonet station KTUU-Midtown as it gives real time storm precipitation and is centrally located in the study corridor. During each event the precipitation requirements in the QAPP were met. Based on these data, all four storms that were sampled were considered to have met storm event criteria.

Flow Measurements

Flow velocities were measured using a geomagnetic flow meter at most stations. Although not required by the QAP, duplicative flow measurements were taken at SWM08 and SWM12 during the four sampling events. Relative percent differences (RPDs) between flow velocities ranged from 0.24 to 19 indicating good agreement between measurements (Table 1). This parameter was duplicated at a rate of 20% during 2021.



Table 1. Field Duplicate Relative Percent Difference for Doppler Flow Measurements

Storm Event Date	SWM08	SWM12
8/27/2021	4.3	6.7
9/02/2021	12.4	18.6
9/24/2021	0.2	7.2
10/08/2021	14.5	5.0

At station SWM07, the volumetric method was utilized to determine flow during the last sampling event due to low flow, where repeated bucket fill-time measurements were made, and the average measurement was used to calculate the flow velocity. No measurement quality objectives for this method were provided in the project QAP, as the parameter is essentially self-correcting as it includes repeated measurements. However, the coefficient of variation (CV), a percentage representing the standard deviation divided by the mean of a population, was calculated to determine variability of this measurement. Bucket measurements showed low CVs of $\leq 10\%$ (Table 2), indicating good consistency between measurements.

Table 2. Coefficients of Variation for Volume/Time Flow Measurements

Storm Event Date	SWM07
8/27/2021	---
9/02/2021	---
9/24/2021	---
10/08/2021	7.4

2. Sample Handling and Holding Time Compliance

For most analyses, samples were taken directly from the stormwater flow into laboratory-cleaned sample bottles; for TAH samples, small “VOA” vials containing preservative were typically filled from the PAH sample bottles. For every storm event, all samples were appropriately labeled, and the chains of custody completed as prescribed in the QAP. For all storm events, samples were maintained in the coolers at less than 6 °C or delivered to the laboratory at ambient temperatures within a few hours of sampling, which meets EPA’s sampling preservation and holding requirements for temperature. Sample custody was maintained; samples were hand delivered directly to the laboratory by the sampling crew within hours of sample collection.

The holding times specified in the QAP (MOA 2016) were met for all parameters.

3. Comparisons of Field Replicate Analyses

Conventional Parameters

Replicates of parameters analyzed in the field were taken as a measure of field variability/ precision, where precision was calculated as either an RPD (for dissolved oxygen {DO}) or the difference between



measurements (for pH, turbidity, temperature, and conductivity) as defined in the QAP. However, it should be noted that the precision values listed in the QAP for field instruments pertain to the precision of the instrument and are not realistic goals for natural variability of stormwater field measurements. In a high stormwater outflow situation, samples collected only a few minutes apart would be expected to show considerable variability considering that different water masses are being discharged, even though samples are being collected only minutes apart. As such, comparison of field duplicate results here, though compared to the QAP-provided precision standards, are more indicative of field variability than actual instrument precision.

Each sampling event included collection of field replicates at two stations. Field analyses included measurement of the conventional parameters of DO, pH, temperature, turbidity, and specific conductivity. Replicates were taken at a rate of 20% for these parameters, exceeding the 15% prescribed for all parameters in the QAP, and twice for all sampling days, exceeding the once/day requirement in the study plan. Table 3 provides the calculated field variability/precision for conventional parameters measured in the field.

Table 3. Precision and Variability of Field Parameters

Parameter	QAP Standard	8/27/2021		9/02/2021		9/24/2021		10/08/2021	
		SWM08	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
DO	10% RPD	1.37	0.16	9.12	0.68	6.83	1.03	1.62	5.76
pH	±0.2 units	0.09	0.02	0.35	0.01	0.31	0.02	0.11	0.01
Turbidity	±1 NTU	3	9	0.11	0.3	2.50	19	50	4
Temperature	±0.4 °C	0	0	0	0	0	0	0	0
Conductivity	±1 µS/cm	0.4	5.4	3.6	7.1	0.5	1.8	8.8	0.5

Values in **bold** and **red** exceeded the measurement quality objective specified in the QAP.

DO and temperature met the precision goals during all sampling events. pH did not meet the precision limits for two events at SWM08 and turbidity and conductivity frequently did not meet the precision limits due to the variability of the discharge. Failure to meet the precision sensitivities prescribed in the QAP likely reflect the heterogeneous nature of stormwater flow rather than sampling anomalies. Although not specified in the outfall monitoring plan, conductivity was monitored to provide additional information to the field crew.

Replicate samples for the conventional parameters (TSS, BOD, and fecal coliform) were taken as field duplicates at SWM08 and SWM12 and analyzed by the laboratory as a measure of field variability/precision. Replicates were taken at a rate of 20%, exceeding the 15% prescribed for all parameters in the QAP and the once/day requirement in the study plan. Field variability was less than the QAP RPD limits in all but one case (Table 4). The RPD for field replicates of fecal coliform for SWM12 during the fourth storm event was 120%, with a QAP limit of 60%. Again, failure to meet the precision sensitivities prescribed in the QAP likely reflect the heterogeneous nature of stormwater flow rather than sampling anomalies. Calculated RPDs for TSS met the standards prescribed in the QAP. RPDs for BOD were also calculated, but no limits were provided in the project QAP for this parameter, although all RPDs were ≤25%.

Table 4. Field Duplicate Results for Conventional Parameters



Parameter	QAP Precision (RPD)	8/27/2021		9/02/2021		9/24/2021		10/08/2021	
		SWM08	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
TSS	25	8	3	--	9	11	2	15	5
BOD	NA	0	40	2	3	0.32	3	5	1
Fecal Coliform	60	4	42	55	0	12	43	8	120

Values in **bold** and **red** exceeded the precision measurement quality objective specified in the QAP.

Dissolved Copper and Hardness

Field replicates of dissolved copper and hardness were taken at SWM08 and SWM12. Replicates were taken at a rate of 20%, exceeding the 15% prescribed for all parameters in the QAP and the once/day requirement in the study plan. RPD results are presented in Table 5 and show variability below 20% for both parameters and all events.

Table 5. Field Duplicate Results for Dissolved Copper and Hardness as CaCO₃

Parameter	QAP Precision (RPD)	8/27/2021		9/02/2021		9/24/2021		10/08/2021	
		SWM08	SWM12	SWM08	SWM12	SWM08	SWM12	SWM08	SWM12
Dissolved Copper	20	8	4	8	5	9	3	2	2
Hardness	20	4	6	1	7	1	3	8	1

Values in **bold** and **red** exceeded the precision measurement quality objective specified in the QAP.

Organic Parameters

Field replicates for the TAH (BETX) and PAH constituents were obtained at SWM12 during each of the four storm events. This represents a replication rate of 25%, which exceeds the 15% prescribed in the QAP and meets the once/day requirement of the study plan.

The field precision RPDs for TAH and PAH constituents are presented in Table 6. Benzene concentrations were all below detection limits (ND) and RPDs were not calculated. One sample during the second storm had a small concentration of ethylbenzene but the duplicate was non-detect so an RPD could not be calculated. Toluene concentrations were detected in all four storms. The second storm RPD was over the QAP Precision limit of 30%. The samples were already flagged for recovery QC issues and no additional flagging completed. The third storm one sample had a detectable concentration and the other was non-detect and an RPD was unable to be calculated. Most individual PAH analytes were below the detection limits. Those with values detected showed RPD precisions ranging from about 2–47%. Phenanthrene during the first storm was just above the RPD precision at 31%. There were no exceedances during the second and fourth storm. The third storm five analytes were also in exceedance including benzo(b)fluoranthene (46%), benzo(g,h,i)perylene (43%), Indeno(1,2,3-cd)pyrene (43%), phenanthrene (38%), pyrene (47%).

4. Comparisons of Laboratory Controls

Verification analyses for laboratory parameters were conducted by Alaska Water Laboratories and the contracted labs ALS and SGS., the laboratory performing the analyses. All labs are certified by the EPA and the Alaska Drinking Water Program and has an approved QA/QC program. Analytical methods and testing procedures were in adherence with the QAP, standard methods, and EPA-approved protocols and guidelines.

Conventional Parameters

Laboratory method blanks were performed for the conventional parameters BOD, TSS, fecal coliform, and copper. Results from the first storm showed detection of BOD at a concentration of 0.12 mg/L but was under the MDL. There were no detections for TSS or copper. The laboratory control sample and sample duplicate (LCS/LCSD) for the conventional parameters for all storm events were within the laboratory control limits.



Table 6. Field Duplicate Results for TAH and PAH

Parameter	QAP	8/27/2021	9/02/2021	9/24/2021	10/08/2021
	Precision (RPD)	SWM12	SWM12	SWM12	SWM12
TAH (BETX)					
Benzene	20	---	---	---	---
Ethylbenzene	20	---	*	---	---
Toluene	20	0	46	*	3
o-Xylene	20	---	47	---	4
p & m-Xylenes	20	---	49	---	4
PAH					
Acenaphthene	30	---	---	---	---
Acenaphthylene	30	---	---	---	---
Anthracene	30	---	---	---	---
Benzo(a)anthracene	30	---	---	*	---
Benzo(a)pyrene	30	---	---	---	---
Benzo(b)fluoranthene	30	4	7	46	8
Benzo(g,h,l,)perylene	30	8	8	43	8
Benzo(k)fluoranthene	30	---	---	---	---
Chrysene	30	3	20	38	---
Dibenzo(a,h)anthracene	30	---	---	---	---
Fluoranthene	30	14	9	---	14
Fluorene	30	---	---	---	---
Indeno(1,2,3-cd)pyrene	30	2	8	43	---
Naphthalene	30	---	---	18	12
Phenanthrene	30	31	27	38	3
Pyrene	30	2	13	47	4

Values in **bold** and **red** exceeded the precision measurement quality objective specified in the QAP. “---”denotes non-detect values and RPDs could not be calculated.

Dissolved Copper and Hardness

Hardness is computed from magnesium and calcium so the QC for those compounds relate to the quality of the hardness results. All metals and hardness data were within QC limits this year.

Organic Parameters

Trip blanks were collected for the TAH analyses to determine whether the handling of the samples introduced contaminants. The trip blanks for all four storm events showed no evidence of contamination.

The Method Blanks for organics (both TAH and PAH) for the first storm were non-detect except for phenanthrene which was detected just below the MDL at 0.0205 µg/L. With detected concentrations in the samples they were flagged as “J+” for a high estimate of the concentration being present in the sample.

LCS/LCSDs were run, as were Matrix Spikes and Spike Duplicates (MS/MSD), to confirm the accuracy and precision of the analysis of the organic parameters. Spike recoveries confirm accuracy and the RPD

confirms precision. Matrix Spikes confirm the ability to see the target analyte in the sample. The MS/MSD results are presented for the organic analysis in Table 7.

All spike recoveries and their RPDs were within acceptable range for the TAH.

For PAH, the analysis of the samples from all four storm events showed that many of the PAH analytes in the matrix spikes were recovered at levels that fell below both the QAP and laboratory control limits during all four storms. The LCS spike recoveries were out of range for those parameters, indicating a potential matrix interference with these results. Data values were evaluated by looking at those results where the recoveries were found to be 20 points outside the lower laboratory limit or exhibiting an RPD >30. Further, the sample results associated with those analytes were examined in detail as low recoveries coupled with low or non-detect results are an indication that the laboratory is unable to recover the analyte in the matrix. These results were re-qualified with a "J-" or a "UJ-" (if not detected) to indicate that sample results may exhibit a low bias based on poor spike recoveries ascribed to probable matrix interference, although initial qualification of batch sample data was performed by the laboratory based on their best professional judgement.

The recovery of PAH compounds during the extraction and analysis process was represented by the surrogates 2-Methylnaphthalene-d10 and Fluoranthene-d10, which were recovered in range for all samples.

In qualifying the PAH data, it is important to note that the PAH constituents are hydrophobic and are likely to sorb or otherwise associate with particles in the stormwater. Thus, where the quality of the stormwater is highly variable with respect to particulates, PAH constituent exceedances of precision and accuracy limits may be expected. In addition, it should be noted that the MS/MSD analyses for PAH were based on separate field replicates that were obtained for this purpose. Therefore, RPD differences in the analyses may be the result of field variability and not necessarily due to any issues with the laboratory analysis.

Table 7. Laboratory Precision and Accuracy for TAH and PAH

Parameter	QAP Standard		8/27/2021		9/02/2021		9/24/2021		10/08/2021	
	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy	Precision	Accuracy
	RPD	% Rec	RPD	% Rec	RPD	% Rec	RPD	% Rec	RPD	% Rec
TAH										
Benzene	20	79-120	3.5	103/99	2.9	103/100	8	103/112	2	112/110
Ethylbenzene	20	79-121	0.64	109/108	3.3	108/112	2.5	106/103	2.5	108/105
Toluene	20	80-121	0.5	105/105	8.8	100/91	1.4	108/106	2.4	108/105
o-Xylene	20	78-122	1.2	108/107	10.4	105/117	1.9	103/101	1.7	107/105
p & m-Xylenes	20	80-121	1.2	108/107	3.9	107/112	0.13	102/102	2.3	106/103
PAH										
Acenaphthene	30	48-114	8	48/45	112	14/49	14.3	48/56	110	67/19
Acenaphthylene	30	35-121	5.2	50/48	111	14/51	13.5	52/59	109	69/21
Anthracene	30	53-119	9.4	42/38	111	14/51	11.5	48/54	107	67/20
Benzo(a)anthracene	30	59-120	8	40/37	118	15/61	14.9	46/53	104	67/21
Benzo(a)pyrene	30	53-120	9.2	37/34	121	15/60	19	45/55	110	72/21
Benzo(b)fluoranthene	30	53-126	10.10	39/35	121	14/63	19.3	43/52	109	74/22
Benzo(g,h,i)perylene	30	44-128	9.5	35/32	121	12/59	20.5	40/50	112	69/19
Benzo(k)fluoranthene	30	54-128	6.6	37/35	122	15/63	11.1	48/54	108	69/21
Chrysene	30	57-120	7	39/37	117	15/61	15.5	46/54	102	67/22
Dibenzo(a,h)anthracene	30	44-131	9.2	37/33	123	14/58	19.8	43/52	112	72/20
Fluoranthene	30	58-120	8.9	39/35	112	12/54	10.6	45/51	99.5	62/20
Fluorene	30	50-118	7.7	47/43	111	14/51	13.3	50/57	109	67/20
Indeno(1,2,3-cd)pyrene	30	48-130	10.8	36/32	122	13/57	20.5	41/51	112	71/20
Naphthalene	30	43-114	7.9	51/47	106	15/50	18	45/55	112	64/16
Phenanthrene	30	53-115	9.2	43/39	112	13/54	14	46/54	103	65/19
Pyrene	30	53-121	8.5	39/36	111	12/55	10.2	45/50	99.4	63/20

Values in **bold** and **red** did not meet the measurement quality objectives in the QAP.

5. Completeness

Calculated completeness for field sample collection, field measurement, and laboratory results all well exceeded the project goal of 90%. All (100%) of the intended samples were collected for laboratory analysis. Valid field analytical measurements (DO, pH, temperature, turbidity, and conductivity) were recorded 100% of the time; no water quality data points were dismissed. Laboratory data were determined to be 100% complete, with no laboratory results deemed unacceptable or un-usable.

6. Conclusions

A careful review of the results confirmed that the dataset for this project is acceptable and can be used to meet project goals as defined in the study plan. Sampling process and completeness criteria were all met. Holding times were met for all samples for all four storms. Field duplication results for some parameters fell outside QAP-specified levels where expected, which is consistent with the fact that these “duplicates” are actually replicates that indicate field variability rather than a measurement of precision. Low percent recoveries were seen in some PAH analytes in both the MS and MSDs during 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. Despite the minor QC issues identified in this report, overall evaluation of the analytical QA/QC data indicates that the project data are, for the most part, within established performance criteria and can be used for characterization of stormwater for this project.

7. References

MOA 2020. Monitoring, Evaluation, and Quality Assurance Plan, APDES Permit No. AKS-052558.
Prepared for Alaska Department of Environmental Conservation, Division of Water. Prepared by HDR Engineering, Inc. and Municipality of Anchorage.



Appendix E

Field Logs



This page intentionally left blank.

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>03</u>		DATE: <u>08/27</u> 2021		SAMPLE TIME: <u>09:00</u>		
OUTFALL/NODE ID: <u>1224-1</u>		PHYSICAL LOCATION: <u>Old Seward / Sylvan W.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket <u>Flow Meter</u> <i>March McBirney 2000 Fls-mate</i>				
Flow Meter	Flow Speed (ft/s): <u>3.38</u>	Water Depth (in): <u>4"</u>		Pipe Diam (in): <u>36</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>ITT Rental, Proplus</u>		Turbidimeter: <u>#2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>12.0</u>	<u>93.5</u>	<u>12.46</u>	<u>115.5</u>	<u>7.28</u>	<u>19.3</u> <i>A</i>
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
SWM <u>03</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -01 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>none</u>					
COLOR	<u>none</u>					
CLARITY	<u>clear</u>					
FLOATABLES	<u>none</u>					
DEPOSITS OR STAINS	<u>none</u>					
SHEEN	<u>None</u>					
SURFACE SCUM	<u>none</u>					
DEBRIS	<u>trash down stream</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Rainy, silty sediment in bottom of</u>						
<u>channel</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>04</u>		DATE: <u>08/27/2021</u>		SAMPLE TIME: <u>09:55</u>		
OUTFALL/NODE ID: <u>1224-2</u>		PHYSICAL LOCATION: <u>old Seward / Sylvan E.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket <u>Flow Meter</u> <i>March Mc Birney 2000 Flo-mate</i>				
Flow Meter	Flow Speed (ft/s): <u>0.91</u>	Water Depth (in): <u>7.5</u>		Pipe Diam (in): <u>20</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Proplus</u>		Turbidimeter: <u># 2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>12.6</u>	<u>100</u>	<u>11.8</u>	<u>110.7</u>	<u>7.13</u>	<u>13.4</u> B
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
SWM <u>04</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
SWM _____ -01 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>None</u>					
COLOR	<u>None</u>					
CLARITY	<u>clear</u>					
FLOATABLES	<u>None</u>					
DEPOSITS OR STAINS	<u>None</u>					
SHEEN	<u>None</u>					
SURFACE SCUM	<u>None</u>					
DEBRIS	<u>None</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Downstream channel - Bank full</u>						
<u>Rainy</u>						
Photos: <input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No						

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>05</u>		DATE: <u>08/27/2021</u>		SAMPLE TIME: <u>10:30</u>			
OUTFALL/NODE ID: <u>207-1</u>		PHYSICAL LOCATION: <u>JAVE High School</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <i>marsh McBirney 2000 Flo-Mate</i>					
Flow Meter	Flow Speed (ft/s): <u>3.20</u>	Water Depth (in): <u>2"</u>		Pipe Diam (in): <u>34</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Proplus</u>		Turbidimeter: <u>#2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>12.0</u>	<u>63.8</u>	<u>12.3%</u>	<u>114.9</u>	<u>7.12</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>05</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>Volatiles gas/diesel organics</u>		<u>(nothing in water)</u>				
COLOR	<u>none</u>						
CLARITY	<u>clear slightly cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>Downed leaves</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Rainy, Banks over filled</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>06</u>		DATE: <u>08/27/2021</u>		SAMPLE TIME: <u>08:05</u>		
OUTFALL/NODE ID: <u>314-22</u>		PHYSICAL LOCATION: <u>Maplewood St.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket <input type="checkbox"/> <u>Flow Meter</u> <i>Marsh M&M 2000 Flo-Meter</i>				
Flow Meter	Flow Speed (ft/s): <u>2.9</u>	Water Depth (in): <u>2"</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #	YSI: <u>TH Rentals Proplus</u>			Turbidimeter: <u>#2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	
MEASUREMENT	<u>12.2</u>	<u>16.6</u>	<u>13.09</u>	<u>122.2</u>	<u>6.76</u>	
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
SWM <u>06</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
SWM _____ -01 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>musty</u>					
COLOR	<u>none</u>					
CLARITY	<u>clear</u>					
FLOATABLES	<u>none</u>					
DEPOSITS OR STAINS	<u>none</u>					
SHEEN	<u>none</u>					
SURFACE SCUM	<u>none</u>					
DEBRIS	<u>none</u>		<u>waddy downstream + in culvert</u>			
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Raining, waddy debris downstream</u>						
<u>Bottom of culvert - slightly corroded.</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>07-01</u>		DATE: <u>08/27/2021</u>		SAMPLE TIME: <u>07:30</u>			
OUTFALL/NODE ID: <u>484-1</u>		PHYSICAL LOCATION: <u>Seward Highway N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <input type="checkbox"/> <u>Flow Meter</u> <u>Marsh McBerney 2000 Flo-Mate</u>					
Flow Meter	Flow Speed (ft/s): <u>3.2</u>	Water Depth (in): <u>3.5"</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>ITT Rental Pro-lw</u>		Turbidimeter: <u># 2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>12.6</u>	<u>15.4</u>	<u>11.58</u>	<u>108.7</u>	<u>5.92</u>	<u>139 A</u> <i>18</i>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>07-01</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KG.</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>None</u>						
COLOR	<u>None</u>						
CLARITY	<u>Slightly Cloudy</u>						
FLOATABLES	<u>None</u>						
DEPOSITS OR STAINS	<u>None</u>						
SHEEN	<u>None</u>						
SURFACE SCUM	<u>None</u>						
DEBRIS	<u>Minimal</u>		<u>trash/debris down stream</u>				
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1
 DUP

STATION ID: SWM 08 DATE: 08/27/2021 SAMPLE TIME: 7:45 / 7:50

OUTFALL/NODE ID: 86-1 PHYSICAL LOCATION: Seward Highway S.

OUTFALL FLOW MEASUREMENTS

marsh McKinney 2000 flowmate

Flow Method (circle)	Bucket	Flow Meter <i>Dup: 9.6</i>			
Flow Meter	Flow Speed (ft/s): <u>9.2</u>	Water Depth (in): <u>12</u>	Pipe Diam (in): <u>48</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time
Bucket: 1-gal 5-gal					

IN SITU WATER QUALITY MEASUREMENTS

INSTRUMENT/SERIAL #	YSI: <u>III Rental, ProPlus</u>			Turbidimeter: <u># 2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>12.2</u>	<u>19.4</u>	<u>12.3</u>	<u>105.0</u>	<u>6.48</u>	<u>139</u> <u>492</u>
FIELD REPLICATE	<u>12.2</u>	<u>19.8</u>	<u>12.47</u>	<u>116.7</u>	<u>6.57</u>	<u>5212</u>

DISCRETE WATER QUALITY SAMPLES

SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>08</u> -01	X	X	X			X	X
SWM <u>08</u> -01 Dup	X	X	X			X	X
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							

Description of QC Samples:

Sampler's Initials: KG

STANDARD OBSERVATIONS

PARAMETER	TYPE/SOURCE	EXTENT - COMMENTS
ODOR	<u>None</u>	
COLOR	<u>None</u>	
CLARITY	<u>Mostly clear</u>	
FLOATABLES	<u>None</u>	
DEPOSITS OR STAINS	<u>None</u>	
SHEEN	<u>None</u>	
SURFACE SCUM	<u>None</u>	
DEBRIS	<u>None</u>	

WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:

Both draining, YSI - taken in pool down stream

Photos: Yes No

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>09</u>		DATE: <u>08/07/2021</u>		SAMPLE TIME: <u>08:15</u>			
OUTFALL/NODE ID: <u>499-1</u>		PHYSICAL LOCATION: <u>Ben Boeke W.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>Marsh McBrney 2550 Flowmeter</u>			
Flow Meter	Flow Speed (ft/s): <u>1.02</u>		Water Depth (in): <u>1.5</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>ITT Rental, Proplus</u>		Turbidimeter: <u>#2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>D.O</u>	<u>11.5</u>	<u>12.6</u>	<u>117.4</u>	<u>6.69</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>09</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>None</u>						
COLOR	<u>None</u>						
CLARITY	<u>Clear</u>						
FLOATABLES	<u>None</u>						
DEPOSITS OR STAINS	<u>None</u>						
SHEEN	<u>None</u>						
SURFACE SCUM	<u>None</u>						
DEBRIS	<u>None</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>10</u>		DATE: <u>09/27/2021</u>		SAMPLE TIME: <u>08:30</u>			
OUTFALL/NODE ID: <u>525-2</u>		PHYSICAL LOCATION: <u>Ben Boeke E</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <input type="checkbox"/> <u>Flow Meter</u> <u>Marsh McBirney 2500 flow meter</u>					
Flow Meter	Flow Speed (ft/s): <u>4.74</u>	Water Depth (in): <u>3.5</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Proplus</u>		Turbidimeter: <u>#2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>11.8</u>	<u>96.1</u>	<u>13.06</u>	<u>120.6</u>	<u>6.64</u>	<u>51.0</u> ³	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>10</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>none / rusty smell</u>						
COLOR	<u>rust orange</u>			<u>Rust around culvert</u>			
CLARITY	<u>clear</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Light Raining</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

STATION ID: SWM <u>441</u>		DATE: <u>08/27/2021</u>		SAMPLE TIME: <u>09:25</u>			
OUTFALL/NODE ID: <u>348-1</u>		PHYSICAL LOCATION: <u>John's Rd. and Botanical Ct.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>Marsh McBirney 2000 Flo-Mate</u>					
Flow Meter	Flow Speed (ft/s): <u>0.78</u>	Water Depth (in): <u>10.5"</u>		Pipe Diam (in): <u>36.</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TT Rentals, ProPlus</u>			Turbidimeter: <u>#2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>11.9</u>	<u>41.9</u>	<u>12.65</u>	<u>110.1</u>	<u>6.63</u>	<u>21.0</u> A	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>11</u> -01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -01 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>None</u>						
COLOR	<u>None</u>						
CLARITY	<u>Clear</u>						
FLOATABLES	<u>Birch seeds</u>						
DEPOSITS OR STAINS	<u>None</u>						
SHEEN	<u>None</u>						
SURFACE SCUM	<u>None</u>						
DEBRIS	<u>None</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>raining</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 1

Dup. MS/MSD
11/30/11/35/11/20

STATION ID: SWM <u>12</u>	DATE: <u>08/27/2021</u>	SAMPLE TIME: <u>11:30/11:35/11:20</u>
OUTFALL/NODE ID: <u>1454-1</u>	PHYSICAL LOCATION: <u>Lynwood Detection Pond</u>	

OUTFALL FLOW MEASUREMENTS

Flow Method (circle)	Bucket	Flow Meter <u>Marsh-McBirney 2000 Flo-Mate</u>				
Flow Meter	Flow Speed (ft/s): <u>7.2</u>	Water Depth (in): <u>6.0</u>	Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal		<u>5000:27</u>				

IN SITU WATER QUALITY MEASUREMENTS

INSTRUMENT/SERIAL #	YSI: <u>TIT Rental, ProPlus</u>			Turbidimeter: <u>#2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>11.8</u>	<u>96.9</u>	<u>12.78</u>	<u>118.3</u>	<u>7.13</u>	<u>237</u>
FIELD REPLICATE	<u>11.8</u>	<u>102.3</u>	<u>12.76</u>	<u>117.8</u>	<u>7.15</u>	<u>228</u>

DISCRETE WATER QUALITY SAMPLES

SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>12</u> -01	X	X	X	X	X	X	X
SWM <u>12</u> -01 Dup	X	X	X	X	X	X	X
MS/MSD or Lab Dup Samples	X	X	X	X	X	X	X
FIELD QC (Trip/Equip)				X			

Description of QC Samples: _____ Sampler's Initials: KG

STANDARD OBSERVATIONS

PARAMETER	TYPE/SOURCE	EXTENT - COMMENTS
ODOR	<u>none</u>	
COLOR	<u>Brown</u>	
CLARITY	<u>cloudy</u>	
FLOATABLES	<u>none - pieces of plants/plant litter</u>	
DEPOSITS OR STAINS	<u>none</u>	
SHEEN	<u>none</u>	
SURFACE SCUM	<u>none</u>	
DEBRIS	<u>none</u>	<u>some trash downstream</u>

WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:

Bank full/ slightly over flowing, raining

Photos: Yes No

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>03</u>		DATE: <u>9/2/2021</u>		SAMPLE TIME: <u>11:00</u>			
OUTFALL/NODE ID: <u>1224-1</u>		PHYSICAL LOCATION: <u>Old Seward/Sylvan W.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>III FH950</u>					
Flow Meter	Flow Speed (ft/s): <u>1.84</u>	Water Depth (in): <u>3</u>		Pipe Diam (in): <u>36</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TTT Rental, Pro Plus</u>			Turbidimeter: <u>2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>11.7</u>	<u>230.0</u>	<u>9.70</u>	<u>89.7</u>	<u>7.36</u>	<u>32.8</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>03</u> -02	<u>X</u>	<u>X</u>	<u>X</u>	<u>1</u>		<u>X</u>	<u>X</u>
SWM _____ -02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>N/A</u>						
COLOR	<u>600-1000 (slightly)</u>			<u>N/A</u>			
CLARITY	<u>N/A</u>						
FLOATABLES	<u>None</u>						
DEPOSITS OR STAINS	<u>Sediment and Algae</u>						
SHEEN	<u>N/A</u>						
SURFACE SCUM	<u>N/A</u>						
DEBRIS	<u>N/A</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Raining moderate</u>							
Photos <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>04</u>		DATE: <u>9/12/2021</u>		SAMPLE TIME: <u>11:05</u>				
OUTFALL/NODE ID: <u>1274-2</u>		PHYSICAL LOCATION: <u>Old Seward/Sylvan E.</u>						
OUTFALL FLOW MEASUREMENTS								
Flow Method (circle)		Bucket		Flow Meter <u>TTT F1950</u>				
Flow Meter		Flow Speed (ft/s): <u>0.71</u>		Water Depth (in): <u>6"</u>				
Pipe Diam (in): <u>20"</u>								
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)			
Bucket: 1-gal 5-gal								
IN SITU WATER QUALITY MEASUREMENTS								
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental P_o Plus</u>		Turbidimeter: <u>2</u>				
Temp (°C)		SpC (µS/cm)		DO (mg/L)				
MEASUREMENT		DO (% sat)		pH				
FIELD REPLICATE		Turb (NTU)						
		<u>13.2</u>		<u>259.6</u>				
		<u>9.70</u>		<u>92.6</u>				
		<u>7.48</u>		<u>19.6</u>				
DISCRETE WATER QUALITY SAMPLES								
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)						
		FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>04</u> -02		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -02 Dup								
MS/MSD or Lab Dup Samples								
FIELD QC (Trip/Equip)								
Description of QC Samples:				Sampler's Initials: <u>KG</u>				
STANDARD OBSERVATIONS								
PARAMETER		TYPE/SOURCE		EXTENT - COMMENTS				
ODOR		<u>N/A</u>						
COLOR		<u>clear</u>		<u>none</u>				
CLARITY		<u>clear</u>						
FLOATABLES		<u>N/A</u>						
DEPOSITS OR STAINS								
SHEEN		<u>N/A</u>						
SURFACE SCUM		<u>N/A</u>						
DEBRIS		<u>N/A</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:								
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No								

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>05</u>		DATE: <u>9/2/2021</u>		SAMPLE TIME: <u>12:05</u>			
OUTFALL/NODE ID: <u>207-1</u>		PHYSICAL LOCATION: <u>SAVE High School</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter Flow Meter			
Flow Meter		Flow Speed (ft/s): <u>1.40</u>		Water Depth (in): <u>6</u>			
Pipe Diam (in): <u>32</u>		PI FH950					
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)		
Bucket: 1-gal 5-gal							
Total Time		Rate (gal/s)					
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental Pro Plus</u>		Turbidimeter: <u>2</u>			
Temp (°C)		SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT		<u>13.1</u>	<u>72.5</u>	<u>9.87</u>	<u>94.3</u>		
FIELD REPLICATE		<u>7.09</u>	<u>55.4</u>				
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>05</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>Musty</u>						
COLOR	<u>N/A</u>						
CLARITY	<u>clear</u>						
FLOATABLES	<u>N/A</u>						
DEPOSITS OR STAINS	<u>N/A</u>						
SHEEN	<u>N/A</u>						
SURFACE SCUM	<u>N/A</u>						
DEBRIS	<u>N/A</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Drizzling, some grass growing into collar</u>							
Photos <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: <u>SWM 06</u>		DATE: <u>9 / 2 / 2021</u>		SAMPLE TIME: <u>10.00</u>		
OUTFALL/NODE ID: <u>314-22</u>		PHYSICAL LOCATION: <u>Maple wood St.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket		<u>Flow Meter</u> TTT #4950		
Flow Meter	Flow Speed (ft/s): <u>0.74</u>	Water Depth (in): <u>1</u>		Pipe Diam (in): <u>24 Squash</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TTT Pro Plus</u>		Turbidimeter: <u>2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>11.5</u>	<u>152.7</u>	<u>9.73</u>	<u>89.3</u>	<u>6.97</u>	<u>4.76</u>
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
SWM <u>06</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -02 Dup						
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials:			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>N/A</u>					
COLOR	<u>N/A</u>					
CLARITY	<u>N/A</u>					
FLOATABLES	<u>N/A</u>					
DEPOSITS OR STAINS	<u>N/A</u>					
SHEEN	<u>N/A</u>					
SURFACE SCUM	<u>N/A</u>					
DEBRIS	<u>Woody debris</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Basely drizzling Slightly irregular bottom</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>07</u>		DATE: <u>9 / 2 / 2021</u>		SAMPLE TIME: <u>12:30</u>			
OUTFALL/NODE ID: <u>484-1</u>		PHYSICAL LOCATION: <u>Seward Highway N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle) <u>Bucket</u> <small>calculated from bucket</small> Flow Meter							
Flow Meter	Flow Speed (ft/s): <u>0.07</u>		Water Depth (in): <u>0.75</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: <u>1-gal</u> 5-gal	<u>20</u>	<u>2</u>	<u>2</u>	<u>2</u>	<u>8</u>	<u>0.5</u>	
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>FT Rental ProPlus</u>		Turbidimeter: <u>2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>12.9</u>	<u>46.8</u>	<u>10.45</u>	<u>98.9</u>	<u>7.33</u>	<u>20.8</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>07</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM 07 -02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>Musty</u>						
COLOR	<u>N/A</u>						
CLARITY	<u>Slightly cloudy</u>						
FLOATABLES	<u>N/A</u>						
DEPOSITS OR STAINS	<u>N/A Rust</u>						
SHEEN	<u>N/A</u>						
SURFACE SCUM	<u>N/A</u>						
DEBRIS	<u>N/A</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Dripping</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>08</u>		DATE: <u>9/2/2021</u>		SAMPLE TIME: <u>8:50</u> <u>8:55</u>			
OUTFALL/NODE ID: <u>86-1</u>		PHYSICAL LOCATION: <u>Seward Highway S.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>TT FH950</u> <u>Dup - 1.44</u>					
Flow Meter	Flow Speed (ft/s): <u>1.63</u>	Water Depth (in): <u>1.5</u>		Pipe Diam (in): <u>42</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TT Rental, Pro Plus</u>		Turbidimeter: <u>2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>11.4</u>	<u>241.5</u>	<u>11.81</u>	<u>108.1</u>	<u>6.38</u>	<u>8.42</u>	
FIELD REPLICATE	<u>11.4</u>	<u>245.1</u>	<u>10.78</u>	<u>98.6</u>	<u>6.73</u>	<u>8.53</u>	
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>08</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>08</u> -02 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>Hydro carbon</u>			<u>in area</u>			
COLOR	<u>N/A</u>						
CLARITY	<u>Good</u>						
FLOATABLES	<u>N/A</u>						
DEPOSITS OR STAINS	<u>Iron / rust on downstream</u>						
SHEEN	<u>N/A</u>						
SURFACE SCUM	<u>N/A</u>						
DEBRIS	<u>N/A</u>			<u>Fallen Leaves</u>			
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Raining lightly, starting to pick up.</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

@ calibrated on site

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>09</u>		DATE: <u>9 / 2 / 2021</u>		SAMPLE TIME: <u>12:55</u>			
OUTFALL/NODE ID: <u>499-1</u>		PHYSICAL LOCATION: <u>Ben Boeke W.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)	Bucket	Flow Meter		<u>Visual</u>	<i>unable to take measurement due to depth.</i>		
Flow Meter	Flow Speed (ft/s): <u>0.33</u>	Water Depth (in): <u>0.5</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>ITT Rental, Pro Plus</u>			Turbidimeter: <u>2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>11.9</u>	<u>18.0</u>	<u>10.16</u>	<u>94.8</u>	<u>7.23</u>	<u>10.8</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>09</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____-02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>WN</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	N/A						
COLOR	N/A						
CLARITY	N/A						
FLOATABLES	N/A						
DEPOSITS OR STAINS	N/A						
SHEEN	N/A						
SURFACE SCUM	N/A						
DEBRIS	N/A						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Drizzling. Many people had to get out of cars due to increased traffic @ Sullivan Arena</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

*53 x0
travel 1 ft*

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>10</u>		DATE: <u>9 / 2 / 2021</u>		SAMPLE TIME: <u>9:35</u>			
OUTFALL/NODE ID: <u>525-2</u>		PHYSICAL LOCATION: <u>Ben Boeke E.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>III</u> FH95D			
Flow Meter		Flow Speed (ft/s): <u>2.17</u>		Water Depth (in): <u>1.5</u>			
Pipe Diam (in): <u>24"</u>		Bucket Measurements		Time 1 (s)			
Time 2 (s)		Time 3 (s)		Time 4 (s)			
Total Time		Rate (gal/s)		Bucket: 1-gal 5-gal			
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>III Rental Pro Plus</u>		Turbidimeter: <u>2</u>			
Temp (°C)		SpC (µS/cm)		DO (mg/L)			
DO (% sat)		pH		Turb (NTU)			
MEASUREMENT		<u>11</u>		<u>419.6</u>			
FIELD REPLICATE		<u>11.36</u>		<u>103.0</u>			
<u>7.02</u>		<u>5.23</u>					
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)					
		FECAL		BOD		TSS	
		TAqH		TAH		Dissolved Cu	
		Hardness					
SWM <u>10</u> -02		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
SWM _____ -02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER		TYPE/SOURCE		EXTENT - COMMENTS			
ODOR		<u>none</u>					
COLOR		<u>none</u>					
CLARITY		<u>clear</u>					
FLOATABLES		<u>none</u>					
DEPOSITS OR STAINS		<u>iron</u>		<u>iron stain on culvert + below on concrete</u>			
SHEEN		<u>none</u>					
SURFACE SCUM		<u>none</u>					
DEBRIS		<u>none</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Lightly raining</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>11</u>		DATE: <u>9/2/2021</u>		SAMPLE TIME: <u>10:30</u>			
OUTFALL/NODE ID: <u>348-1</u>		PHYSICAL LOCATION: <u>John's Rd and Botanical Ct</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>11 inches TIT FH950</u>			
Flow Meter		Flow Speed (ft/s): <u>0.46</u>		Water Depth (in): <u>0.8 ft</u> Pipe Diam (in): <u>36</u>			
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TIT Rental, Proplus</u>		Turbidimeter: <u>2</u>			
MEASUREMENT		Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
FIELD REPLICATE		<u>13.0</u>	<u>44.0</u>	<u>9.98</u>	<u>94.2</u>	<u>7.08</u>	<u>89.3</u>
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>11</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -02 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KG</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>Yes →</u>		<u>Salty/sea water smell</u>				
COLOR	<u>none slight grey/brown.</u>						
CLARITY	<u>slightly cloudy</u>						
FLOATABLES	<u>→</u>		<u>Birch seeds</u>				
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none.</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Raining, rain picked up</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 2

STATION ID: SWM <u>12</u>	DATE: <u>9/2/2021</u>	SAMPLE TIME: <u>11:25</u> <u>11:30</u>
OUTFALL/NODE ID: <u>1454-1</u>	PHYSICAL LOCATION: <u>Lynwood detention Pond</u>	

Dup
11:35
MS/MS

OUTFALL FLOW MEASUREMENTS

Flow Method (circle)	Bucket	Flow Meter FT, F#950 <u>5.16 Dup</u>				
Flow Meter	Flow Speed (ft/s): <u>4.28</u>	Water Depth (in): <u>6</u>	Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						

IN SITU WATER QUALITY MEASUREMENTS

INSTRUMENT/SERIAL #	YSI: <u>FT Rental, Pro Plus</u>			Turbidimeter: <u>2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>12.3</u>	<u>236.5</u>	<u>10.38</u>	<u>97.0</u>	<u>7.32</u>	<u>31.7</u>
FIELD REPLICATE	<u>12.3</u>	<u>229.4</u>	<u>10.31</u>	<u>96.3</u>	<u>7.33</u>	<u>31.4</u>

DISCRETE WATER QUALITY SAMPLES

SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>12</u> -02	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>12</u> -02 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FIELD QC (Trip/Equip)							

Description of QC Samples:

Sampler's Initials: KG

STANDARD OBSERVATIONS

PARAMETER	TYPE/SOURCE	EXTENT - COMMENTS
ODOR	<u>N/A</u>	
COLOR	<u>Grey/Brown</u>	
CLARITY	<u>Woody</u>	
FLOATABLES	<u>N/A</u>	
DEPOSITS OR STAINS	<u>Snake Rust</u>	
SHEEN	<u>N/A</u>	
SURFACE SCUM	<u>N/A</u>	
DEBRIS	<u>Some trash</u>	<u>came through while sampling</u>

WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:

Light drizzle

Photos: Yes No

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>0 3</u>		DATE: <u>9 / 24 / 2021</u>		SAMPLE TIME: <u>9:45</u>			
OUTFALL/NODE ID: <u>1224-1</u>		PHYSICAL LOCATION: <u>Old Seward / Sylvan W.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>TT Rental, FH950</u>					
Flow Meter	Flow Speed (ft/s): <u>2.27</u>	Water Depth (in): <u>3.0</u>		Pipe Diam (in): <u>36</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TT Rental, ^{YS5} ProPlus</u>		Turbidimeter: <u># 2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>3.4</u>	<u>91.3</u>	<u>14.0</u>	<u>104.9</u>	<u>7.07</u>	<u>30.4</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>0 3</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KK</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>clear</u>						
FLOATABLES	<u>veg</u>		<u>seeds, leaves</u>				
DEPOSITS OR STAINS	<u>brown/green collar</u>		<u>stain</u>				
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>leaves ↓, snow/rain. ^{wet} snow on ground.</u>							
<u>Flow meter: TT Rental</u>							
<u>FH950</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>04</u>		DATE: <u>9/24/2021</u>		SAMPLE TIME: <u>9:55</u>			
OUTFALL/NODE ID: <u>1224-2</u>		PHYSICAL LOCATION: <u>old Seward / Sylvan E.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>TT Rental; FH950</u>					
Flow Meter	Flow Speed (ft/s): <u>0.34</u>	Water Depth (in): <u>5.5</u>		Pipe Diam (in): <u>20</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TT Rental, YSE ProPlus</u>		Turbidimeter: <u># 2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>5.1</u>	<u>124.6</u>	<u>13.66</u>	<u>106.4</u>	<u>6.99</u>	<u>11.7</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>04</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>K K</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>clear</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Rain / Snow. Snow + leaves on ground.</u>							
Flowmeter: <u>TT Rental</u>							
<u>FH950</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>05</u>		DATE: <u>9/24/2021</u>		SAMPLE TIME: <u>10:50</u>			
OUTFALL/NODE ID: <u>207-1</u>		PHYSICAL LOCATION: <u>SAVE High School</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> TIT Rental, FH950					
Flow Meter	Flow Speed (ft/s): <u>1.41</u>	Water Depth (in): <u>4</u>		Pipe Diam (in): <u>32</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: TIT Rental, ProPlus		Turbidimeter: # <u>2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>4.8</u>	<u>108.5</u>	<u>100.7</u> ←	<u>12.87</u>	<u>7.08</u>	<u>389</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>05</u> -03	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
SWM _____ -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KK</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>slightly tan</u>						
CLARITY	<u>clear</u>						
FLOATABLES	<u>veg</u>		<u>seeds</u>				
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Rain/snow snow + leaves on ground.</u>							
Flow meter: TIT Rental FH950							
Photos: <u>Yes</u> No							

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>06</u>		DATE: <u>09/24/2021</u>		SAMPLE TIME: <u>8:35</u>		
OUTFALL/NODE ID: <u>364-22</u>		PHYSICAL LOCATION: <u>Maplewood St.</u>				
OUTFALL FLOW MEASUREMENTS						
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>TII Rental, FH950</u>				
Flow Meter	Flow Speed (ft/s): <u>1.63</u>	Water Depth (in): <u>1.75</u>		Pipe Diam (in): <u>24</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)	
Bucket: 1-gal 5-gal						
IN SITU WATER QUALITY MEASUREMENTS						
INSTRUMENT/SERIAL #		YSI: <u>TII Rental, Proplus</u>		Turbidimeter: <u>#2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>2.3</u>	<u>43.9</u>	<u>16.75</u>	<u>113.1</u>	<u>8.9</u>	<u>530</u>
FIELD REPLICATE						
DISCRETE WATER QUALITY SAMPLES						
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)					
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu Hardness
SWM <u>06</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
SWM _____ -03 Dup						<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples						
FIELD QC (Trip/Equip)						
Description of QC Samples:			Sampler's Initials: <u>LCF</u>			
STANDARD OBSERVATIONS						
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS			
ODOR	<u>none</u>					
COLOR	<u>none</u>					
CLARITY	<u>clear</u>					
FLOATABLES	<u>microbial</u>		<u>some leaves</u>			
DEPOSITS OR STAINS	<u>none</u>					
SHEEN	<u>none</u>					
SURFACE SCUM	<u>none</u>					
DEBRIS	<u>leaves down stream</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:						
<u>Bottom of culvert is rusted cuts show on ground</u>						
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No						

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>07</u>		DATE: <u>9 / 24 / 2021</u>		SAMPLE TIME: <u>07:05</u>			
OUTFALL/NODE ID: <u>484-1</u>		PHYSICAL LOCATION: <u>Seward Highway N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> <u>FF950: Titer Reptol</u>					
Flow Meter	Flow Speed (ft/s): <u>2.03</u>	Water Depth (in): <u>1.5</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>FF Pro Plus</u>		Turbidimeter: <u>#2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>4.2</u>	<u>25.4</u>	<u>14.47</u>	<u>111.0</u>	<u>5.33</u>	<u>128</u> A	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>07</u> -03	X	X	X	X	X	X	X
SWM _____ -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KG</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>Slightly brown</u>						
CLARITY	<u>Slightly cloudy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>leaves ↓</u>		<u>backpack down stream</u>				
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>light rain, leaves ↓</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

**MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG**

STORM # 3

STATION ID: SWM <u>08</u>		DATE: <u>09/24/2021</u>		SAMPLE TIME: <u>07:15/07:20</u> <i>Dup</i>			
OUTFALL/NODE ID: <u>86-1</u>		PHYSICAL LOCATION: <u>Seward Highway S.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>8.34</u> Flow Meter <u>TT Rental, FH950</u>					
Flow Meter	Flow Speed (ft/s): <u>9.12</u>	Water Depth (in): <u>4.5</u>		Pipe Diam (in): <u>42</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>TT Rental, Proplus</u>			Turbidimeter: <u>#2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>3.5</u>	<u>43.3</u>	<u>15.45</u>	<u>117.0</u>	<u>5.82</u>	<u>34.9</u>	
FIELD REPLICATE	<u>3.5</u>	<u>43.8</u>	<u>14.43</u>	<u>108.6</u>	<u>6.13</u>	<u>37.4</u>	
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>08</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>08</u> -03 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KG, KK</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>no color</u>						
CLARITY	<u>clear</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>Bubbles down stream</u>						
DEBRIS	<u>leaves</u>		<u>bike DS</u>				
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>raining, leaves ↓</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>09</u>		DATE: <u>09/24/2021</u>		SAMPLE TIME: <u>17:55</u>			
OUTFALL/NODE ID: <u>499-1</u>		PHYSICAL LOCATION: <u>Ben Boeke W.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>(1) 2.5 (Visual)</u>			
Flow Meter	Flow Speed (ft/s): <u>0.5</u>	Water Depth (in): <u>1.25</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>ITT Rental Pro Plus</u>		Turbidimeter: <u>2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>5.3</u>	<u>15.3</u>	<u>13.6</u>	<u>107.2</u>	<u>6.42</u>	<u>4.95</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>09</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KG</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>none</u>						
COLOR	<u>none</u>						
CLARITY	<u>clear</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>none</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>leaves everywhere</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Outfall totally full of leaves, cleaned out channel to channel + entrance sample</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>10</u>		DATE: <u>09/24/2021</u>		SAMPLE TIME: <u>8:15</u>			
OUTFALL/NODE ID: <u>585-2</u>		PHYSICAL LOCATION: <u>Ben Boeke E.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket <u>Flow Meter</u> TTT Rentals, FH950					
Flow Meter	Flow Speed (ft/s): <u>4.00</u>	Water Depth (in): <u>2</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)	
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: TTT Rentals, ProPlus		Turbidimeter: <u>2</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)	
MEASUREMENT	<u>7.9</u>	<u>280.5</u>	<u>13.57</u>	<u>116.7</u>	<u>6.25</u>	<u>12.2</u>	
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>10</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KG</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>Ammonia/iron smell</u>						
COLOR	<u>none</u>						
CLARITY	<u>clear</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>yes</u>		<u>orange stain on rock, + Culvert</u>				
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>leaves ↓</u>							
Photos <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

STATION ID: SWM <u>11</u>	DATE: <u>09/24/2021</u>	SAMPLE TIME: <u>9:10</u>
OUTFALL/NODE ID: <u>348-1</u>	PHYSICAL LOCATION: <u>Johns Rd and Botanical Cir</u>	

OUTFALL FLOW MEASUREMENTS

Flow Method (circle)	Bucket	<u>Flow Meter</u>	<u>TTT Rental, FH950</u>			
Flow Meter	Flow Speed (ft/s): <u>0.40</u>	Water Depth (in): <u>8.0</u>	Pipe Diam (in): <u>36</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal						

IN SITU WATER QUALITY MEASUREMENTS

INSTRUMENT/SERIAL #	YSI: <u>TTT Rental, ProPlus</u>			Turbidimeter: <u>#2</u>		
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT	<u>3.9</u>	<u>75.2</u>	<u>14.35</u>	<u>109.1</u>	<u>9.1</u>	<u>34.1</u>
FIELD REPLICATE						

DISCRETE WATER QUALITY SAMPLES

SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>11</u> -03	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u> </u> -03 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							

Description of QC Samples:

Sampler's Initials: YK

STANDARD OBSERVATIONS

PARAMETER	TYPE/SOURCE	EXTENT - COMMENTS
ODOR	<u>none</u>	
COLOR	<u>clear none</u>	
CLARITY	<u>clear</u>	
FLOATABLES	<u>veg.</u>	<u>birch seeds, pine needles</u>
DEPOSITS OR STAINS	<u>none</u>	
SHEEN	<u>none</u>	
SURFACE SCUM	<u>none</u>	
DEBRIS	<u>none</u>	

WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:

Show on the ground.

Photos: Yes No

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 3

Prim Dup MS/MSD

STATION ID: SWM <u>12</u>		DATE: <u>9/24/2021</u>		SAMPLE TIME: <u>10:10/10:15/10:20</u>			
OUTFALL/NODE ID: <u>1454-1</u>		PHYSICAL LOCATION: <u>Cynwood Detention Pond</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		<u>Flow Meter</u> <u>TT rental, FH950</u>			
Flow Meter		Flow Speed (ft/s): <u>4.39</u> <u>4.72</u> <u>dup</u>		Water Depth (in): <u>5.0</u>		Pipe Diam (in): <u>24</u>	
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>TT Ketch Probes</u>			Turbidimeter: <u>#2</u>		
		Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT		<u>24</u>	<u>128.7</u>	<u>106.7</u> <u>↔</u>	<u>14.60</u>	<u>7.15</u>	<u>290</u>
FIELD REPLICATE		<u>24</u>	<u>125.9</u>	<u>14.45</u>	<u>105.6</u>	<u>7.17</u>	<u>309</u>
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>12</u> -03	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
SWM <u>12</u> -03 Dup	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>	<u>✓</u>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)	<u>1</u>	<u>2</u> <u>↔</u> <u>✓</u>	<u>4</u>	<u>6</u>	<u>2</u>	<u>2</u>	
Description of QC Samples:		<u>3 trip blanks</u>			Sampler's Initials: <u>KK</u>		
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>none</u>						
COLOR	<u>brown, gray</u>						
CLARITY	<u>very cloudy / muddy</u>						
FLOATABLES	<u>none</u>						
DEPOSITS OR STAINS	<u>iron on culvert</u>						
SHEEN	<u>none</u>						
SURFACE SCUM	<u>none</u>						
DEBRIS	<u>none</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Snowy rain. snow + leaves on ground.</u>							
Photos <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>03</u>		DATE: <u>10/18/2021</u>		SAMPLE TIME: <u>11:00</u>			
OUTFALL/NODE ID: <u>1224-1</u>		PHYSICAL LOCATION: <u>Old Seward / Sylvan W.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>TT, FH 950</u>			
Flow Meter	Flow Speed (ft/s): <u>0.96</u>		Water Depth (in): <u>1.5"</u>		Pipe Diam (in): <u>3.6"</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>Pro Plus, TT Rental</u>		Turbidimeter: <u>2 A</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>7.5</u>	<u>419.9</u>	<u>8.43</u>	<u>70.1</u>	<u>7.44</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>03</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR							
COLOR	<u>Clear</u>						
CLARITY	<u>Clear</u>						
FLOATABLES	<u>Leaves</u>						
DEPOSITS OR STAINS	<u>Some dirt</u>						
SHEEN	<u>None</u>						
SURFACE SCUM	<u>None</u>						
DEBRIS	<u>None</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Moved leaves, were back watering slightly. Not raining</u>							
<u>out of collar, they</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>04</u>		DATE: <u>10/8/2021</u>		SAMPLE TIME: <u>11:05</u>				
OUTFALL/NODE ID: <u>1224-2</u>		PHYSICAL LOCATION: <u>Old Seward/Sylvan E.</u>						
OUTFALL FLOW MEASUREMENTS								
Flow Method (circle)		Bucket		Flow Meter <u>TT, FH950</u>				
Flow Meter		Flow Speed (ft/s): <u>0.41</u>		Water Depth (in): <u>1.5</u>				
Pipe Diam (in): <u>20"</u>		Bucket Measurements		Time 1 (s)				
Time 2 (s)		Time 3 (s)		Time 4 (s)				
Total Time		Rate (gal/s)		Bucket: 1-gal 5-gal				
IN SITU WATER QUALITY MEASUREMENTS								
INSTRUMENT/SERIAL #		YSI: <u>ProPlus, TT Rental</u>		Turbidimeter: # <u>2</u> <u>Dup</u>				
Temp (°C)		SpC (µS/cm)		DO (mg/L)				
DO (% sat)		pH		Turb (NTU)				
MEASUREMENT		<u>8.8</u>		<u>754</u>				
FIELD REPLICATE		<u>9.71</u>		<u>83.8</u>				
<u>7.53</u>		<u>7.21</u>						
DISCRETE WATER QUALITY SAMPLES								
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)						
		FECAL		BOD		TSS		
SWM <u>04</u> -04		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
SWM _____ -04 Dup		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
MS/MSD or Lab Dup Samples		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
FIELD QC (Trip/Equip)		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
Description of QC Samples:						Sampler's Initials: <u>KG</u>		
STANDARD OBSERVATIONS								
PARAMETER		TYPE/SOURCE		EXTENT - COMMENTS				
ODOR		<u>None - Musty</u>						
COLOR		<u>None</u>						
CLARITY		<u>None</u>						
FLOATABLES		<u>leaves</u>						
DEPOSITS OR STAINS		<u>None</u>						
SHEEN		<u>None</u>						
SURFACE SCUM		<u>None</u>						
DEBRIS		<u>None</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:								
<u>Cleared leaves from collar, cloudy</u>								
Photos: <input checked="" type="radio"/> Yes <input type="radio"/> No								

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>05</u>		DATE: <u>10/8</u> /2021		SAMPLE TIME: <u>12:15</u>			
OUTFALL/NODE ID: <u>207-1</u>		PHYSICAL LOCATION: <u>SAVE High School</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>III, FH950</u>			
Flow Meter		Flow Speed (ft/s): <u>0.77</u>		Water Depth (in): <u>0.5</u>			
Pipe Diam (in): <u>32</u>		Bucket Measurements		Time 1 (s)			
Time 2 (s)		Time 3 (s)		Time 4 (s)			
Total Time		Rate (gal/s)		Bucket: 1-gal 5-gal			
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>Pro Plus, III Rental</u>		Turbidimeter: <u>#2 A</u>			
Temp (°C)		SpC (µS/cm)		DO (mg/L)			
DO (% sat)		pH		Turb (NTU)			
MEASUREMENT		<u>9.8</u>		<u>335.2</u>			
FIELD REPLICATE		<u>11.40</u>		<u>96.9</u>			
<u>7.67</u>		<u>49.2</u>					
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)					
		FECAL		BOD		TSS	
TAqH		TAH		Dissolved Cu		Hardness	
SWM <u>05</u> -04		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
SWM <u> </u> -04 Dup		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
MS/MSD or Lab Dup Samples		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
FIELD QC (Trip/Equip)		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER		TYPE/SOURCE		EXTENT - COMMENTS			
ODOR		<u>Musty</u>					
COLOR		<u>Brown/Orange</u>					
CLARITY		<u>Slightly</u>					
FLOATABLES		<u>Leaves</u>					
DEPOSITS OR STAINS		<u>Dirt</u>					
SHEEN		<u>None</u>					
SURFACE SCUM		<u>Some scums downstream</u>					
DEBRIS		<u>None</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Collas Crooked. Some algae, not raining</u>							
Photos <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>06</u>		DATE: <u>10/8/2021</u>		SAMPLE TIME: <u>10:05</u>			
OUTFALL/NODE ID: <u>314-22</u>		PHYSICAL LOCATION: <u>Maplewood Street</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>TT, FH950</u>			
Flow Meter		Flow Speed (ft/s): <u>0.2</u>		Water Depth (in): <u>0.75"</u> Pipe Diam (in): <u>24"</u>			
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>Pro Plus, TT Rental</u>		Turbidimeter: <u>2 cell A</u>			
		Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT		<u>6.5</u>	<u>146.6</u>	<u>11.43</u>	<u>93.9</u>	<u>6.92</u>	<u>30.0</u>
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>06</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:			Sampler's Initials: <u>KG</u>				
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE		EXTENT - COMMENTS				
ODOR	<u>None</u>						
COLOR	<u>Orange/Brown/slightly yellow</u>						
CLARITY	<u>Clear</u>						
FLOATABLES	<u>leaves down</u>						
DEPOSITS OR STAINS	<u>Rust</u>						
SHEEN	<u>None</u>						
SURFACE SCUM	<u>None</u>						
DEBRIS	<u>None</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Cloudy</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>07</u>		DATE: <u>10/6/2021</u>		SAMPLE TIME: <u>8:45</u>			
OUTFALL/NODE ID: <u>484-1</u>		PHYSICAL LOCATION: <u>Seward Highway N.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle) <u>Bucket</u>		Flow Meter					
Flow Meter	Flow Speed (ft/s):	Water Depth (in): <u>3/4"</u>		Pipe Diam (in): <u>24</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: <u>1-gal</u> <u>5-gal</u>	<u>2.20</u>	<u>2.02</u>	<u>2.01</u>	<u>2.05</u>	<u>2.07</u>		
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>Pro Plus, TTT Rental</u>			Turbidimeter: <u>2 cell A</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>7.4</u>	<u>143.6</u>	<u>13.68</u>	<u>114.0</u>	<u>5.81</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>07</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM _____ -04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>Slightly musty</u>						
COLOR	<u>Slightly grey</u>						
CLARITY	<u>Cloudy</u>						
FLOATABLES	<u>leaves</u>						
DEPOSITS OR STAINS	<u>None</u>						
SHEEN	<u>None</u>						
SURFACE SCUM	<u>Naturally occurring suds</u>						
DEBRIS	<u>None</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>YSI calibrated by TTT. DO calibration in field</u>							
<u>leaves ↓, cloudy just stopped raining</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>08</u>		DATE: <u>10/8/2021</u>		SAMPLE TIME: <u>8:55 / 9:00</u>			
OUTFALL/NODE ID: <u>86-1</u>		PHYSICAL LOCATION: <u>Seward Highway S.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)	Bucket	<u>3.89</u>		<u>Flow Meter</u>			
				<u>TTI, FH950</u>			
Flow Meter	Flow Speed (ft/s):	<u>4.50</u>	Water Depth (in):	<u>3.5"</u>			
				Pipe Diam (in): <u>42"</u>			
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #	YSI: <u>PT, Pro Plus</u>			Turbidimeter: <u># 2, cell B/Dup</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH		
MEASUREMENT	<u>7.9</u>	<u>327.9</u>	<u>11.61</u>	<u>97.8</u>	<u>6.67</u>		
FIELD REPLICATE	<u>7.9</u>	<u>336.7</u>	<u>11.80</u>	<u>98.1</u>	<u>6.77</u>		
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>08</u> -04	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>08</u> -04 Dup	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>Hydrocarbons / exhaust</u>						
COLOR	<u>Brown / orange</u>						
CLARITY	<u>Slightly cloudy</u>						
FLOATABLES	<u>leaves</u>						
DEPOSITS OR STAINS	<u>rust on collar</u>						
SHEEN	<u>None</u>						
SURFACE SCUM	<u>Natural suds DS</u>						
DEBRIS	<u>None</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>leaves ↓, very light sprinkle.</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>09</u>		DATE: <u>10/8/2021</u>		SAMPLE TIME: <u>9:25</u>			
OUTFALL/NODE ID: <u>499-1</u>		PHYSICAL LOCATION: <u>Ben Boeke W.</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle) Bucket <u>Visual Estimate</u> Flow Meter							
Flow Meter	Flow Speed (ft/s) <u>0.2</u>		Water Depth (in): <u>1/4"</u>		Pipe Diam (in): <u>24"</u>		
Bucket Measurements	Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time Rate (gal/s)		
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>Pro Plus, TIT Rental</u>		Turbidimeter: <u>2, cell A</u>			
	Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH Turb (NTU)		
MEASUREMENT	<u>6.5</u>	<u>98.2</u>	<u>8.13</u>	<u>66.4</u>	<u>7.11</u> <u>18</u>		
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER	SAMPLES COLLECTED (CHECK BOX)						
	FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu	Hardness
SWM <u>09</u> -04	x	x	x	x	x	x	x
SWM _____ -04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials:			
STANDARD OBSERVATIONS							
PARAMETER	TYPE/SOURCE			EXTENT - COMMENTS			
ODOR	<u>None</u>						
COLOR	<u>None</u>						
CLARITY	<u>Pretty clear</u>			<u>Bit of sediment</u>			
FLOATABLES	<u>None</u>						
DEPOSITS OR STAINS	<u>None</u>						
SHEEN	<u>Natural sheen</u>						
SURFACE SCUM	<u>None</u>						
DEBRIS	<u>leaves in channel</u>						
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Barely flowing. YSI in bottle, insitu reading from sample, not enough water in channel. cloudy</u>							
Photos: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		<u>Accompanied by MOA.</u>					

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>10</u>		DATE: <u>10 / 8 / 2021</u>		SAMPLE TIME: <u>9:45</u>				
OUTFALL/NODE ID: <u>525-2</u>		PHYSICAL LOCATION: <u>Ben Boeke E</u>						
OUTFALL FLOW MEASUREMENTS								
Flow Method (circle)		Bucket		Flow Meter <u>TTT, FH950</u>				
Flow Meter		Flow Speed (ft/s): <u>2.74</u>		Water Depth (in): <u>1.5</u> Pipe Diam (in): <u>24</u>				
Bucket Measurements		Time 1 (s)		Time 2 (s)				
Bucket: 1-gal 5-gal								
IN SITU WATER QUALITY MEASUREMENTS								
INSTRUMENT/SERIAL #		YSI: <u>TTT Rental, Applus</u>		Turbidimeter: <u>#2</u>				
MEASUREMENT		Temp (°C)		SpC (µS/cm)				
FIELD REPLICATE		DO (mg/L)		DO (% sat)				
		pH		Turb (NTU)				
		<u>9.3</u>		<u>404.5</u>				
		<u>12.08</u>		<u>105.3</u>				
		<u>6.82</u>		<u>26.1</u>				
DISCRETE WATER QUALITY SAMPLES								
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)						
		FECAL		BOD		TSS		
SWM <u>10</u> -04		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
SWM _____ -04 Dup								
MS/MSD or Lab Dup Samples								
FIELD QC (Trip/Equip)								
Description of QC Samples:						Sampler's Initials: <u>WN</u>		
STANDARD OBSERVATIONS								
PARAMETER			TYPE/SOURCE			EXTENT - COMMENTS		
ODOR			<u>none, metallic</u>					
COLOR			<u>none</u>					
CLARITY			<u>clear</u>					
FLOATABLES			<u>none</u>					
DEPOSITS OR STAINS			<u>iron / rust on culvert</u>					
SHEEN			<u>none</u>					
SURFACE SCUM			<u>natural suds</u>					
DEBRIS			<u>none</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:								
<u>leaved, cloudy</u>								
<u>Accompanied by MOA.</u>								
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No								

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

STORM # 4

STATION ID: SWM <u>11</u>		DATE: <u>10/8/2021</u>		SAMPLE TIME: <u>10:35</u>			
OUTFALL/NODE ID: <u>348-1</u>		PHYSICAL LOCATION: <u>John's Rd. and Botanical</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter <u>TT Rental, FH950</u>			
Flow Meter		Flow Speed (ft/s): <u>0.14</u>		Water Depth (in): <u>4</u>			
				Pipe Diam (in): <u>36</u>			
Bucket Measurements		Time 1 (s)		Time 2 (s)			
		Time 3 (s)		Time 4 (s)			
Bucket: 1-gal 5-gal				Total Time			
				Rate (gal/s)			
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>Pro Plus, TT Rental</u>		Turbidimeter: <u>2 A</u>			
		Temp (°C)		SpC (µS/cm)			
		DO (mg/L)		DO (% sat)			
MEASUREMENT		pH		Turb (NTU)			
FIELD REPLICATE							
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)					
		FECAL		BOD		TSS	
		TAqH		TAH		Dissolved Cu	
		Hardness					
SWM <u>11</u> -04		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
SWM <u> </u> -04 Dup							
MS/MSD or Lab Dup Samples							
FIELD QC (Trip/Equip)							
Description of QC Samples:				Sampler's Initials: <u>KG</u>			
STANDARD OBSERVATIONS							
PARAMETER		TYPE/SOURCE		EXTENT - COMMENTS			
ODOR		<u>Musty</u>					
COLOR		<u>Brown (light)</u>					
CLARITY		<u>Clear</u>					
FLOATABLES		<u>leaves</u>					
DEPOSITS OR STAINS		<u>None</u>					
SHEEN		<u>None</u>					
SURFACE SCUM		<u>Some natural suds</u>					
DEBRIS		<u>None</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>light rain, some sediment build up</u>							
Photos: <u>Yes</u> No							

MOA Stormwater Management Program
 WATER QUALITY STORM SAMPLING FIELD LOG

PRM STORM # 4
 TB Dup MS/MSD

STATION ID: SWM <u>1 2</u>		DATE: <u>10/8/2021</u>		SAMPLE TIME: <u>11:30, 11:35, 11:40</u>			
OUTFALL/NODE ID: <u>1454-1</u>		PHYSICAL LOCATION: <u>Lynwood Detention Pond</u>					
OUTFALL FLOW MEASUREMENTS							
Flow Method (circle)		Bucket		Flow Meter		1.36 Dup <u>TT, FH950</u>	
Flow Meter		Flow Speed (ft/s): <u>1.43</u>		Water Depth (in): <u>1</u>		Pipe Diam (in): <u>24</u>	
Bucket Measurements		Time 1 (s)	Time 2 (s)	Time 3 (s)	Time 4 (s)	Total Time	Rate (gal/s)
Bucket: 1-gal 5-gal							
IN SITU WATER QUALITY MEASUREMENTS							
INSTRUMENT/SERIAL #		YSI: <u>Pro Plus, TT Rental</u>			Turbidimeter: <u>2 B, Dup</u>		
		Temp (°C)	SpC (µS/cm)	DO (mg/L)	DO (% sat)	pH	Turb (NTU)
MEASUREMENT		<u>7.9</u>	<u>665.5</u>	<u>11.60</u>	<u>97.6</u>	<u>7.60</u>	<u>108</u>
FIELD REPLICATE		<u>7.9</u>	<u>666.6</u>	<u>10.95</u>	<u>92.4</u>	<u>7.61</u>	<u>104</u>
DISCRETE WATER QUALITY SAMPLES							
SAMPLE NUMBER		SAMPLES COLLECTED (CHECK BOX)					
		FECAL	BOD	TSS	TAqH	TAH	Dissolved Cu
SWM <u>1 2</u> -04		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
SWM <u>1 2</u> -04 Dup		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MS/MSD or Lab Dup Samples		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
FIELD QC (Trip/Equip)					<input checked="" type="checkbox"/>		
Description of QC Samples:			<u>Trip blanks x3</u>			Sampler's Initials: <u>KG</u>	
STANDARD OBSERVATIONS							
PARAMETER		TYPE/SOURCE			EXTENT - COMMENTS		
ODOR		<u>None</u>					
COLOR		<u>Light Brown</u>					
CLARITY		<u>Slightly</u>					
FLOATABLES		<u>Some leaves</u>					
DEPOSITS OR STAINS		<u>Rust</u>					
SHEEN		<u>None</u>					
SURFACE SCUM		<u>None/Natural sub</u>					
DEBRIS		<u>None</u>					
WEATHER - VEGETATION - OTHER UNUSUAL CONDITIONS - COMMENTS:							
<u>Not Raining</u>							
Photos: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No							