Phase II Monitoring and Assessment Plan

Prepared by
Ada County Highway District
Boise, Idaho
April 15, 2021
NPDES Permit #IDS028185

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List of Abbreviations

°C	degrees Celsius
ACM	alternative control measure
ACHD	Ada County Highway District
AV	area velocity
BMP	best management practice
BOD5	biological oxygen demand – 5-day
CaCO3	calcium carbonate
CCC	criterion continuous concentration
CFR	Code of Federal Regulations
CMC	criterion maximum concentration
COC	chain of custody
COD	chemical oxygen demand
CWA	Clean Water Act
DO	dissolved oxygen
DQI	data quality indicator
DQO	data quality objective
E.Coli	Escherichia coli
EPA	Environmental Protection Agency
IDAPA	Idaho Administrative Procedure Act
LDPE	low-density polyethylene
MDL	method detection limit
mg	milligram
mL	milliliter
MS4	Municipal Separate Storm Sewer System
NH3	ammonia
NO2	nitrite
NO3	nitrate
NPDES	National Pollutant Discharge Elimination System
NWS	National Weather Service
PG	procedure guidance
PRDL	project required detection limit
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan for NPDES Stormwater Monitoring
RPD	relative percent difference
SOP	Standard Operating Procedures
TDS	total dissolved solids
TMDL	total maximum daily limit
TKN	total Kjeldahl nitrogen
TSS	total suspended solids

WQL	Boise City Public Works Water Quality Laboratory

Executive Summary

Ada County Highway District (ACHD) was issued a second cycle National Pollutant Discharge Elimination System municipal separate storm sewer system (MS4) permit (Permit) for stormwater discharge from the MS4 in the areas of Meridian and Eagle, Idaho. The United States Environmental Protection Agency issued the Permit to ACHD (Permit number IDS028185) on December 9, 2020, effective February 1, 2021. The Permit requires the development and implementation of a Monitoring and Assessment Plan (Plan) throughout the 5-year term of the permit.

Field and laboratory activities will be conducted according to the *Quality Assurance Project Plan for NPDES Stormwater Monitoring (QAPP).* Quality assurance and quality control (QA/QC) plans are integral parts of the monitoring program. Field QA/QC samples will be collected and analyzed to help identify potential sources of introduced error in the monitoring process. Laboratory analyses will be performed by the Boise City Water Quality Laboratory and Analytical Laboratories, Inc. in Boise, Idaho. The QA/QC procedures are designed to ensure data collected meet data quality objectives developed specifically for Permit-required monitoring activities. The Plan documents QC sampling procedures, acceptance criteria, and data management details specific to this monitoring plan.

The Plan describes the overall approach to MS4 monitoring and provides details for both wet weather discharge monitoring and dry weather outfall screening. The Plan also provides guidance for data collection efforts, including descriptions of meteorological and hydrological data collection procedures and use, sample handling procedures, as well as analytical and qualitative data acquisition.

Section 1

Introduction

1.1 Basis for Monitoring Plan

The Monitoring and Assessment Plan (Plan) outlines the Ada County Highway District's (ACHD) approach for quantifying wet and dry weather pollutant loadings and identifying non-stormwater dry weather flows from the municipal separate storm sewer system (MS4) as required by ACHD's National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Phase II Permit (Permit) #IDS028185. Specifically, this Plan serves as an Alternative Control Measure (ACM) required by Permit Part 4 Special Conditions for Discharges to Impaired Waters and Permit Part 4.2 Monitoring/Assessment Activities.

1.2 Plan Objectives

This Plan is designed to direct data collection efforts to assist in meeting the following Permit objectives:

- **Part 4.2**: Quantify, at a minimum, the pollutant loadings for the impairment pollutants (Temperature, Total Phosphorus, *E. coli*, Sedimentation/Siltation) from the portions of the MS4 discharging into the Boise River and its tributaries
- **Part 4.3**: Quantify the estimated pollutant reduction accomplished from Pollutant Reduction Activities
- **Part 3.2.5:** Identify non-stormwater flows from MS4 outfalls during dry weather
- **Part 3.2.5**: Detect and identify illicit discharges and illegal connections, and investigate potentially problematic MS4 outfalls

This document outlines the monitoring plan approach and includes specific *Quality Assurance Project Plan for Stormwater Monitoring* (QAPP) elements recommended by the Environmental Protection Agency (EPA). EPA-recommended QAPP elements are addressed as either program elements or monitoring plan elements.

Monitoring plan elements are described in full in this document, while program elements applicable to all monitoring programs are addressed in the QAPP. Monitoring plan elements are those components that contain details specific to each individual monitoring plan. Program elements consist of the standardized monitoring components that all individual monitoring plans developed under the Permit reference. A list of program and monitoring plan elements is included in Table 1-1.

Table 1-1. QAPP Element Document Reference

EPA Recommended QAPP Elements	QAPP Element	Plan Element; Section
Group A: Project Management		
A1 – Title and Approval Sheet	X	
A2 – Table of Contents	X	X
A3 – Distribution List	X	
A4a – Project Organization	X	
A4b – Task Organization		X; 1.3
A5 – Problem Definition/Background	X	

EPA Recommended QAPP Elements	QAPP Element	Plan Element; Section
A6 – Project/Task Description		X; 1.2
A7a – Quality Objectives and Criteria for Measurement Data	X	
A7b – Method Dependent Criteria for Measurement Data		X; 5.2
A8 – Special Training Needs/Certification	X	
A9 – Documents and Records	X	
Group B: Data Generation and Acquisition		
B1 – Sampling Process and Design		X; 2
B2 – Sampling Methods		X; 3, 4
B3 – Sample Handling and Custody		X; 4.3, 4.4
B4 – Analytical Methods		X; 4.1,4.2
B5a – Quality Control	X	
B5b – QA/QC Sampling Schedule		X; 5.1
B6 – Instrument/Equipment Testing, Inspection, and Maintenance		X; 3
B7 – Instrument/Equipment Calibration and Frequency		X; 3
B8 – Inspection/Acceptance of Supplies and Consumables	X	
B9 – Non-direct Measurements	X	X; 6.1
B10 – Data Management	X	X; 6.2
Group C: Assessment and Oversight		
C1 – Assessments and Response Actions	X	
C2 – Reports to Management	X	
Group D: Data Validation and Usability		
D1 – Data Review, Verification, and Validation	X	
D2 – Verification and Validation Methods	X	
D3 – Reconciliation and User Requirements	X	

1.3 Task Organization

ACHD conducts wet weather discharge monitoring and dry weather outfall screening under the Permit. The wet weather discharge monitoring program is implemented with the assistance of a consultant team. Key roles and job functions are described in the QAPP. The monitoring program organization chart is presented in Figure 1-1.

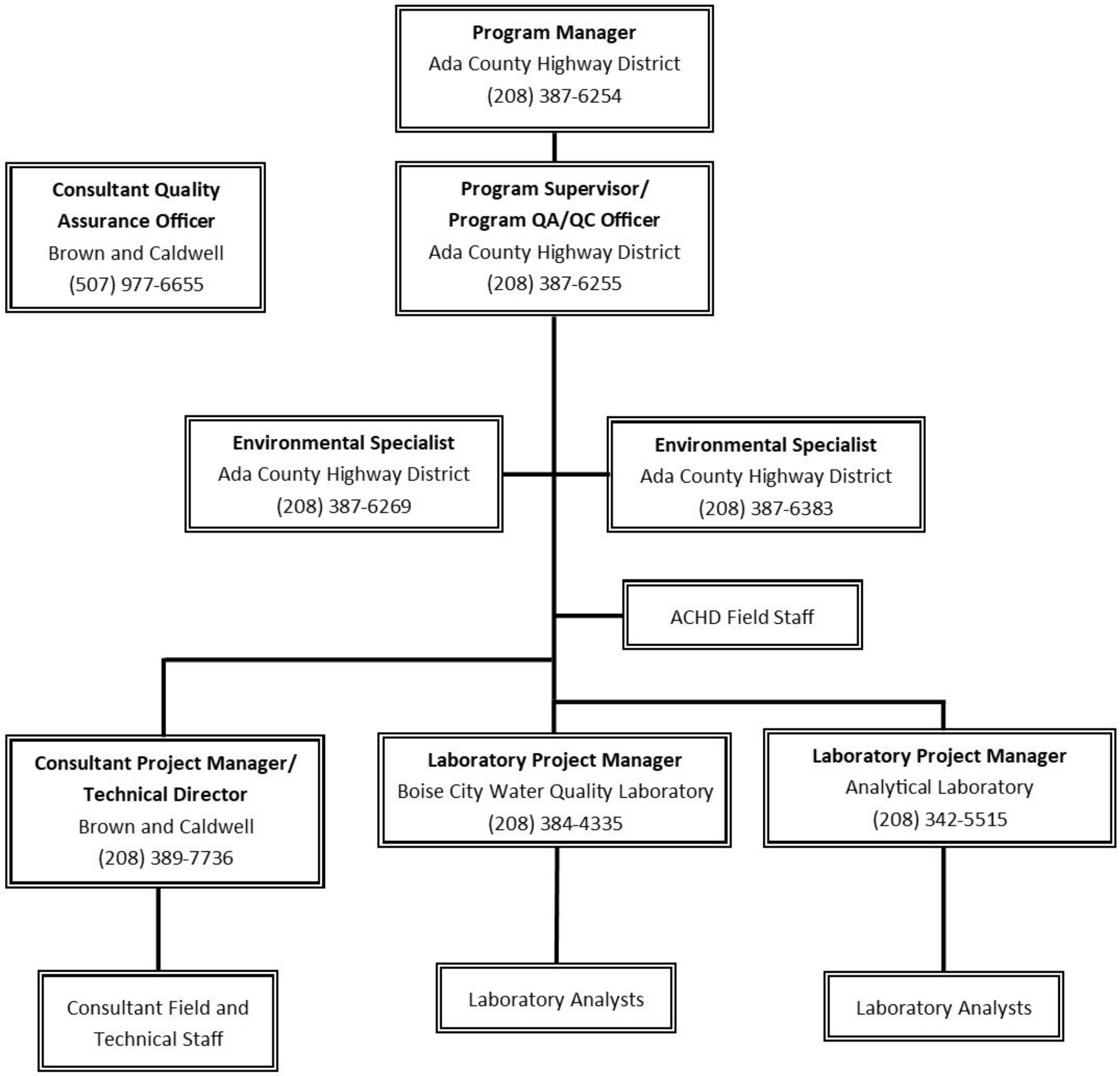

Figure 1-1. Monitoring Organization Chart

Section 2

Monitoring Process Design

The monitoring process design consists of the collection of wet weather discharge data during storm events and the screening of MS4 outfalls during periods of dry weather. Section 2.1 provides an overview of the methods used to obtain wet weather discharge data, and Section 2.2 provides an overview of the methods used in dry weather outfall screening. More detail on monitoring equipment operation and maintenance is included in Section 3. Specific descriptions of sampling procedures are provided in Section 4.

2.1 Wet Weather Discharge Monitoring

Data to be collected includes a combination of continuous rainfall data, continuous flow data, and water quality data. Information on the monitoring site is in Section 2.1.1. A detailed site description is included in Section 2.1.2.

Data collection at the monitoring station is facilitated by a combination of automated sampling and measurement equipment and manual sampling, observation, and characterization activities. Automated sampling equipment includes a flowmeter with an area velocity (AV) sensor installed in the storm drain pipe. The flowmeter records wet weather discharge, instantaneous and cumulative flow volumes, as well as background flows when present.

The flowmeter is connected via a data cable to the automatic sampler. The automatic sampler and flowmeter are programmed to collect flow-weighted composite samples. Throughout a sampling event, the flowmeter triggers the sampler to initiate pumping at a pre-programmed volume interval to collect a representative composite sample of the stormwater runoff.

The monitoring station is associated with a rain gauge to collect precipitation data to use in conjunction with sampling and flow data for analysis and quality assurance. Additionally, forecasts, weather, and hourly precipitation data for the weather station located at the Boise Airport are available from the National Weather Service (NWS) at http://www.crh.noaa.gov/data/obhistory/KBOI.html.

Water quality data collection will be accomplished through a variety of sampling and analytical methods. Discrete grab samples will be collected for laboratory analysis and analysis of field parameters. Composite samples will be split at the Boise City Public Works Water Quality Laboratory (WQL) for analysis.

2.1.1 Site Selection

Under the first-cycle Phase II Permit, wet weather discharge data was collected from two subwatersheds, Chrisfield and Edgewood, within the Phase II MS4. The data collected from each site has been used to characterize pollutants discharging from predominately residential land use areas. With the issuance of a new Permit, ACHD has decided to focus wet weather discharge monitoring on a subwatershed with differing characteristics from those subwatersheds that were previously monitored. The following criteria were considered during site selection:

- Land use
- Size of contributing drainage area
- Access: private versus ACHD right-of-way
- Pipe size
- Pipe configuration

- Water quality treatment
- ACHD roadway projects in the watershed
- Total maximum daily load waterway
- Travel time to site

Based on the criteria, a review of monitoring locations was conducted and the State monitoring site was selected. The State subwatershed discharges to Fivemile Creek, an impaired waterbody (Table 2-2), has a mixture of land uses, a relatively large contributing drainage area, and older infrastructure. Additionally, ACHD has an easement along the outfall pipe which will provide a suitable location to install sampling equipment. Further details on the State monitoring site are in the section below.

2.1.2 Site Description

The State monitoring site is located next to Fivemile Creek, near the intersection of E. State Ave. and Cathy Ln. in Meridian, Idaho. Table 2-1 provides a summary overview of the monitoring station location and associated subwatershed. The catchment area discharges through an outfall directly into Fivemile Creek. The subwatershed is approximately 34 acres and consists of both residential and commercial land uses. Commercial land use within the subwatershed contains a restaurant, office buildings, shops, and churches. Existing drainage structures include a siphon drain, sand and grease traps, and catch basins. Open irrigation ditches can be seen throughout the subwatershed, but little is known about dry weather flows from this outfall. Projects within the drainage area associated with ACHD's Five Year Work Plan include asphalt work, curb infill, curb replacement, and small storm drain improvements. A map of the subwatershed area is included in the Figures section at the end of the document.

ACHD plans to install a concrete pad and equipment box within the easement between E. State Ave and Fivemile Creek. The equipment box will house the sampling equipment. Additionally, a manhole will be installed near the concrete pad to provide access to the storm drain pipe. This manhole will be where the AV sensor and sampler tubing line are installed, as well as the location where grab samples will be collected.

Table 2-1. Monitoring Station Information

Station Information	State (Site ID: 18)
Location	639 E. State Ave, Meridian Idaho
Subwatershed Area	34.8 acres
Land Uses (percentage)	45% residential (43% low density, 2% high density) 41% right-of-way 14% commercial <1% open space
Receiving Water	Fivemile Creek
Outfall Distance from Station	TBD
Rain Gauge Location	Chrisfield
Pipe Construction	TBD
Power Source	TBD
Parking	Park in the cul-de-sac at the intersection of E. State Ave. and Cathy Ln, walk east toward Fivemile Creek.
Equipment Location	TBD
Sampling Considerations	TBD
Data Considerations	TBD

Station Information	State (Site ID: 18)
Watershed BMP Summary	Catch basins, sand and grease traps, siphon drain

2.2 Dry Weather Outfall Screening

The outfall screening process is comprised of two components: visual dry weather inspections and dry weather discharge monitoring to detect illicit discharges and illegal connections into the MS4. This process enables ACHD to inspect all outfalls during a five-year period with provisions for prioritizing and sorting outfalls.

Data collection includes qualitative characteristics of the outfalls, flow measurements, water quality data, and when flow is present, information useful in identifying the source of flow. The outfall locations are described below in Section 2.2.1. Details on the visual inspections of outfalls and dry weather discharge monitoring are provided in Sections 2.2.3 and 2.2.4, respectively.

Water quality data collection will be accomplished through a variety of sampling and analytical methods. Discrete grab samples will be collected for laboratory analysis and analysis of field parameters. The WQL and Analytical Laboratories, Inc will be used for sample analysis.

2.2.1 Outfall Screening Locations

ACHD owns 395 outfalls that discharge to 52 different waterways in the NPDES Phase II Permit area. The outfalls drain all major land uses within the Permit area and have the potential to convey illicit discharges to receiving waters. A map depicting the outfall locations within the Permit area is in the Figures section at the end of the document. A complete list of outfalls and number of outfalls discharging to specific receiving waters is provided in Appendix D. Table 2-2 lists the impaired receiving waterbodies and associated impairment pollutants identified in the Idaho Water Quality Standards (IDAPA 58.01.02.140.12).

Table 2-2 Impaired Receiving Waterbodies

Waterbody /Assessment Unit/Description	Impairment Pollutants
Tenmile Creek ID17050114SW008_03 *Tenmile Creek- 3rd order below Blacks Creek Reservoir*	Cause Unknown, nutrients suspected; Sediment/Sedimentation; *E.coli;* Chlorpyrifos
Fivemile, Eightmile, and Ninemile Creeks ID17050114SW010_02 *Fivemile, Eightmile, and Ninemile Creeks - 1st and 2nd Order*	*E.coli*
Fivemile Creek ID17050114SW010_03 *Fivemile Creek - 3rd order*	Cause Unknown, nutrients suspected; Sediment/Sedimentation; *E.coli;* Chlorpyrifos
Boise River ID17050114SW005_06 *Boise River - Veterans Memorial Parkway to Star Bridge*	Temperature; Fecal Coliform; Sedimentation/Siltation

2.2.2 Outfall Prioritization

Planned prioritization of outfalls selected for screening helps to ensure that Permit requirements are met in the outfalls screened each year. The following categories have been established for use in prioritizing outfalls each year:

- Outfalls with a scheduled visual inspection
- Outfalls with previously documented dry weather flows
- Outfalls of immediate attention

2.2.3 Visual Dry Weather Inspection Schedule

As required by Permit Part 3.2.5.2, visual dry weather inspections must be conducted on a minimum of 50 outfalls per year. Additionally, ACHD will aim to perform a visual dry weather inspection on all outfalls over the five-year Permit term. A screening schedule has been developed to ensure that these benchmarks are met each year. The schedule was created using the ‘randbetween’ function in excel to prevent any selection bias among the outfalls. The schedule for inspecting all outfalls in the Permit area is in Appendix E. The schedule will be updated at least once each year to reflect any changes in total number of outfalls and outfalls rescheduled due to prioritization needs during the year.

If, during a visual dry weather inspection, an outfall is found to contain a discharge, then the outfall will be treated the same as all documented flowing outfalls, described below.

2.2.4 Dry Weather Discharge Monitoring

Outfalls that are known to have dry weather flows will be sampled annually as specified in Permit Part 3.2.5.3. To date, ACHD has identified 23 outfalls that have flow during periods of dry weather.

Seasonal variation, typically attributable to irrigation and/or high groundwater, has been observed in dry weather flows. To further characterize the pollutants discharged during dry weather, outfalls that contain continuous substantial flows and/or high pollutant concentrations, will be sampled up to two additional times per year.

As required by Permit Part 3.2.5.3, dry weather flows will be traced to find the source. In the case that an ongoing discharge is found to be illicit, ACHD is required to take appropriate action to address and eliminate the source within 60 days of its detection, to the extent allowable under Idaho state law.

2.2.5 Outfalls of Immediate Attention

In addition to the annual scheduled outfall screenings, priority will also be allocated to outfalls that are the subject of public complaints or that ACHD personnel believe may have an increased illicit discharge potential, regardless of if they were originally scheduled for that given year. Examples of increased risk include identification of cross connections, problems with aging infrastructure, or activities and conditions in the drainage area likely to result in an illicit discharge. In these instances, the outfalls in question will be subject to an outfall screening. Any outfalls originally scheduled to be screened may be rescheduled for a later date if time constrains do not allow during the permit year.

Section 3

Monitoring Equipment

This section provides an overview of the types of monitoring equipment planned for use in the Plan. Standard Operating Procedures (SOPs) and procedure guidance (PG) documents are included in Appendix A and provide greater detail describing how equipment is used to accomplish the goals of the monitoring and assessment plan. Manufacturers' recommendations for proper use and maintenance are either included in the SOPs or the equipment manuals referenced in the SOPs.

3.1 Flowmeters

Flow data collection is achieved with a Teledyne Isco 2150 Area Velocity Flow Module and AV sensor. The AV sensor is attached to the flow module via a cable and is secured in the storm drain pipe on a metal ring. The sensor measures liquid level using a pressure transducer and average stream velocity using ultrasonic waves. Flow rate and total flow calculations are performed by the flow module using the measured parameters from the AV sensor and pipe geometry characteristics.

An Isco 2105ci Interface Module is used in conjunction with the 2150 Area Velocity Flow Module. The interface module has an internal modem, the capacity to store rainfall data, and the capability to trigger a sampler. The modem transmits data from the flow module, rain gauge, and sampler to Isco's Flowlink® software. The Flowlink® software is also used to program and download data from the Isco equipment.

Calibration and Maintenance

Routine maintenance of flowmeters, including calibration, will be performed semi-annually by ACHD and the consultant according to the procedures listed in Appendix A. More frequent maintenance or calibration will be performed as warranted by equipment performance.

Calibrating the level requires only offsetting the initial depth of water, if applicable. Typically, no field calibration of the velocity sensor is required. Additional checks on the accuracy of the velocity meter can, however, be conducted using a manual current meter to measure velocity. Depth can be checked by simple measurement and comparison to the recorded value. Readings showing deviations can be corrected using the flowmeter interface while in the field.

3.2 Automatic Samplers

Composite sample collection is accomplished using an Isco 6712 Portable Sampler. Sample aliquots are pumped by a peristaltic pump from the storm drain pipe to a 15-liter low-density polyethylene (LDPE) carboy contained in the base of the sampler. The discharge tubing of the pump is routed into the sample container, which is stored in the base of the automatic sampler and packed with ice to maintain the target sample temperature.

For each sampling event, the automatic sampler will be programmed to collect samples based upon flow-paced signals received from the flow module via a control cable. The sampler collects one sample for each signal from the flow module. Sample aliquot volumes will be programmed and calibrated to produce a flow-weighted composite sample of the storm event discharge consisting of a targeted 17 subsamples. A record of the sampler's operations (e.g., execution data and sample times) is stored on the hard drive of both the sampler and the interface module and may be accessed and downloaded through the interface module or direct connection to the sampler at any time.

Calibration and Maintenance

Routine maintenance of the automatic samplers, including cleaning and calibration, will be performed semi-annually or more frequently as warranted by equipment performance by the consultant and ACHD according to the procedures listed in Appendix A.

The sampler is calibrated by comparing the collected sample volume (measured using a beaker or graduated cylinder) with the required volume that was programmed into the sampler program. The sampler microprocessor will adjust the pump run time to either increase or decrease the sample volume. This process is repeated until the sampler delivers a volume that is within ±10 percent of the requested sample volume.

3.3 Rain Gauges

An Isco 674 rain gauge is used to collect continuous precipitation data throughout the year. The program uses tipping bucket style rain gauges that measure rainfall depths in 0.01-inch increments. The rain gauge is mounted on a pole and is connected via a cable connection to the interface module.

The data collected by the rain gauges is accessible through the interface module in the same manner as flow and sampling data. The data will be compared to the NWS rainfall data to identify geographic variations, revise estimates of runoff coefficients, and analyze and evaluate the water quality data. In addition to using rainfall totals as acceptance criteria for storm event qualification, other program data derived from rainfall records include antecedent dry periods, total rainfall across the permit term, and rainfall intensity during monitored storm events.

Calibration and Maintenance

ACHD will inspect and maintain rain gauges that are owned and operated by ACHD on a monthly basis. Troubleshooting and any non-routine maintenance will be performed by ACHD as necessary. Calibration is not typically required for the tipping bucket rain gauges. If needed, calibration procedures are outlined in the rain gauge equipment manual. Inspection, maintenance, and downloading procedures are listed in Appendix A.

3.4 Handheld Field Parameter Instruments

During grab sample collection, specific parameters will be measured directly in the field using a variety of handheld instruments to collect readings including pH, conductivity, dissolved oxygen content, and temperature. Field parameter instruments will be rinsed with distilled water between measurements. After the sampling event has ended, these instruments will be allowed to air-dry and kept indoors between sampling events.

Handheld field parameter instruments include the following:

- Horiba D-21 pH/temperature meter and Horiba D-51 pH/temperature meter
- Oakton 300 pH/dissolved oxygen (DO)/temperature meter
- YSI-85 DO/salinity/conductivity/temperature meter
- Hach 2100Q turbidity meter
- In-Situ SmarTROLL MP
- In-Situ AquaTROLL 400

Safety monitoring instruments:

- Hazardous vapor monitors including Biosystems PHD6, and GasAlert Max XT II

Calibration and Maintenance

Maintenance will be conducted per manufacturers' recommendations and the procedures listed in Appendix A, or more frequently as warranted by equipment performance. Instruments will be inspected and calibrated prior to each monitoring event. ACHD is responsible for calibration and maintenance and will keep a log in the stormwater monitoring lab for reference.

3.5 Stormwater Test Kit

ACHD utilizes the Hach Stormwater Test Kit for in-field chemical analysis of total chlorine, total copper, and total phenols. Chemical analyses are conducted according to the manufacturer's instructions (Appendix A) using colorimetric comparison of samples treated with reagents to estimate concentration of the constituents of concern. The test kit includes dissolvable, premeasured reagent packets specific to each chemical analysis, viewing tubes, and a color comparator, which holds the viewing tubes in line with a rotating color wheel. The kit also includes a long path viewing adaptor to accommodate the full range of targeted chemical analyses with an incremental accuracy of 0.1 mg/L.

Calibration and Maintenance

A check of reagent accuracy can be completed using reagent specific standard solution. Accuracy will be tested for each packet of reagents used following the test procedures outlined in Appendix A. ACHD is responsible for calibration and maintenance and will keep a spreadsheet for reference.

Color viewing tubes and containers and utensils used for mixing samples will be rinsed with deionized water immediately after sample results are recorded for each analysis. The stormwater test kit will be kept dry and reagent packets will be kept in water-resistant containers between uses.

3.6 Handheld Flow Probe

In sampling locations where a flowmeter is not installed, ACHD utilizes a Global Water FP111 Flow Probe for collecting velocity measurements used in estimating discharge volume of flowing outfalls. The flow probe uses a propeller attached to a telescoping handle. The propeller is protected by a plastic shield that extends around the outer diameter of the propeller to avoid bumping the propeller against the bottom of the pipe/channel or other obstacles.

A small computer with an LCD screen is attached to the handle opposite the propeller. The computer displays velocity as an instantaneous measurement as well as the minimum, maximum, and average velocity readings. The flow probe computer is zeroed immediately prior to collecting new readings.

Discharge flow measurement using the Global Water Flow Probe is discussed in detail in Section 4.2.3.3. If another flow probe is substituted for the Global Water Flow Probe, the substitute will be verified to have the same or higher degree of sensitivity and accuracy.

Calibration and Maintenance

Per the manufacturer's recommendations the flow probe will be allowed to dry between uses and washed with soap as needed to maintain proper operation. The flow probe does not require routine maintenance or calibration other than being kept clean.

Section 4

Sampling Procedures

4.1 Wet Weather Discharge Monitoring Procedures

4.1.1 Analytical Sample Collection Frequency

Samples, measurements and/or assessments conducted in compliance with the Permit must be representative of the nature of the monitored discharge or activity. Wet weather discharge monitoring will be conducted at a minimum frequency of three wet weather events per Permit reporting year (Feb 1 – Jan 31). One of these monitored wet weather events will occur during September-October, as required by Permit Part 6.2.5.4. Though not required, effort will be made to separate sampling events by a minimum of 30 days to better represent seasonal variability.

4.1.2 Wet Weather Discharge Parameter Analysis

The analytical methods planned for use in wet weather discharge monitoring are presented in Table 4-1 below. The Permit requires that sample collection, preservation, and analysis be conducted according to sufficiently sensitive methods/test procedures approved under 40 Code of Federal Regulations (CFR) Part 136, 40 CFR subchapters N or O, or an alternative method that has been approved by EPA. As such, the methods identified below are the selected and preferred options. However, sample, laboratory, or instrument conditions may require the substitution of an alternate Part 136 method. Field parameter measurements provide pH, temperature, conductivity, and DO data. Additional water quality data is provided by laboratory analyses of both grab and composite samples. Table 4-1 identifies the components to be collected by grab samples and as flow-weighted composite samples, along with the analytical methods to be used.

Table 4-1. Analytical Methods for Wet Weather Discharge Constituents

Constituent	Analytical Method	Sample Collection Type
Ammonia (NH3)	SM 4500 NH3-D	C
Total Kjeldahl nitrogen (TKN)	Perstorp PAI-DK01	C
Nitrite plus nitrate (NO_2+NO_3)	EPA 353.2	C
5-day biological oxygen demand (BOD_5)	SM 5210 B	C
Chemical oxygen demand (COD)	Hach 8000	C
Total dissolved solids (TDS)	SM 2540 C	C
Turbidity	EPA 180.1	C
Arsenic – total	EPA 200.7	C
Cadmium – total and dissolved	EPA 200.7	C
Copper – dissolved	EPA 200.7	C
Lead – total and dissolved	EPA 200.7	C
Mercury – total	EPA 245.2	C
Zinc – dissolved	EPA 200.7	C
Hardness (as calcium carbonate [$CaCO_3$])	SM 2340 B	C

Constituent	Analytical Method	Sample Collection Type
Total phosphorus	EPA 200.7	C
Dissolved orthophosphate	EPA 365.1	C
Total suspended solids (TSS)	SM 2540 D	C
E. coli	IDEXX Colilert	G
Conductivity	EPA 120.1	G,f
DO	SM 4500 G	G,f
Temperature	EPA 170.1	G,f*
pH	EPA 150.1	G,f
Flow/discharge volume	Non-specific	f

C = Constituent analysis will be conducted using a composite sample.

G = Constituent analysis will be conducted using a grab sample.

f = Analysis will be conducted in the field.

f= Temperature is recorded during field parameter measurement and is recorded continuously by the AV sensor.*

4.1.3 Weather Forecast and Storm Selection

The Stormwater Quality Specialist (or designee) will obtain up-to-date information on a storm's anticipated physical characteristics from the NWS. Information obtained for each forecast will include the probability of precipitation, the expected amount of precipitation, and the expected arrival time of the storm. Weather forecasts and information will ordinarily be obtained via the internet and supplemented as needed by telephone conversations with the NWS meteorologist on duty. The Stormwater Quality Specialist will review weather forecasts on a daily basis and compare them with the established storm selection criteria to determine the likelihood of initiating wet weather discharge sampling.

The EPA's definition of a representative storm event (EPA, 1983) states that the storm precipitation total must be greater than 0.10 inch and that the storm be preceded by a minimum of 72 hours from the previously measurable (greater than 0.10 inch) event.

Considering the Permit requirements and EPA guidance, ACHD will use the following criteria to assist in decision making for selecting forecasted storms to target under typical conditions:

- 70 percent or greater probability of precipitation forecasted
- Quantitative precipitation forecast predicted precipitation of greater than 0.10 inch in a 12-hour period
- Event separated by a minimum of 72 hours of dry weather from the previous measurable storm event (rainfall greater than 0.10 inch)

Criteria for snow conditions include the following:

- Forecasted precipitation in the form of snowfall will be evaluated in the context of the greater weather forecast to determine the likelihood of runoff occurring at the outfall.
- Though snowmelt is considered stormwater runoff, sampling events will not be initiated for collecting runoff from snowmelt alone when criteria for a representative storm are not forecasted to be met.
- Rain-on-snow events will be evaluated on a case-by-case basis due to the variable and sometimes unrepresentative nature of runoff resulting from these conditions.

These criteria represent the general approach to storm event targeting used for this program. Ultimately, the Stormwater Quality Specialist will use these criteria in conjunction with additional forecast information, sampling program and staffing requirements, and other factors to make the decision to target a specific storm. The Stormwater Quality Specialist will communicate the sampling status to the consultant Field Coordinator, laboratory project personnel, and ACHD field sampling staff on a daily basis by means of the

Sampling Event Communication Form (included in Appendix B). If storm selection criteria appear to be met, the Stormwater Quality Specialist will confer with the consultant Field Coordinator. If both parties agree, the consultant Field Coordinator will initiate storm event preparation by advising the sampling team of the upcoming sampling event. At this time, all necessary sample equipment and containers will be prepared.

4.1.4 Monitoring Station Setup

Prior to a sampling event, the Stormwater Quality Specialist or the consultant Field Coordinator will be responsible for readying the flow module and automatic sampler at the monitoring station following the procedures listed on the Setup/Shutdown Form (Appendix B). Whenever possible, setup will be conducted by two trained staff. The Stormwater Quality Specialist (or designee) will be responsible for verifying the operation of and calibrating the handheld field parameter equipment according to the procedures listed in Appendix A. The Stormwater Quality Specialist or designee will ensure that adequate supplies are available for sampling and notify the laboratory of the possible sampling event.

Monitoring station setup activities include the following:

- flushing the Teflon™-lined sampler intake line and silicone discharge tubing with a dilute hydrochloric acid solution
- checking the condition of sampler harness, platform (if applicable), and the sampler humidity indicator
- inspecting electrical and tubing connections for tightness
- installing recharged batteries
- freeing sampler tubing of twists, pinches, or cracks and replacing if needed
- loading bottles and ice into automatic samplers
- programming the sampler settings for flow weighted composite sample collection
- initiating the sampling program
- recording setup information on field data sheets

4.1.4.1 Interface Module Programming

Sampler Enable Condition

The interface module will be programmed to enable the sampler based on the water level in the pipe. The level condition will be programmed after a review of the previous 72 hours of level readings. Once runoff begins and water level increases, the sampler will enable and total flow will be computed toward the trigger volume. Using the sampler enable condition allows for the sampler program to be initiated without the interface module triggering sample collection until storm runoff begins.

Runoff Coefficients and Trigger Volumes

In order to collect a flow-weighted composite sample throughout a storm, estimates will be calculated for the runoff volume expected at the station. The expected runoff volume will be divided by the planned number of sample aliquots, and the resulting value is used as the trigger volume for programming the interface module. The trigger volume is the amount of flow that will be measured before the automatic sampler is triggered to collect a subsample. Therefore, the number of samples collected over the course of a storm is a result of the runoff volume expected for the total storm as forecasted at the time of station set-up.

Calculating the total estimated runoff is a function of the weighted rainfall amount expected and the site-specific runoff coefficient. Precipitation amounts are weighted by multiplying the predicted rainfall amount by the probability of precipitation as forecasted by the NWS. The site-specific runoff coefficient is derived from the percentage of impervious ground cover in the subwatershed and empirical values from observed storm data.

Several variables factor into the actual volume of runoff measured at the monitoring station. Refining the runoff coefficient to produce a reliable estimate of runoff volume is an ongoing effort. The runoff coefficient will continue to be revised as more information is gathered through monitoring, mapping, and other stormwater management efforts.

Historical data suggests that variability in the size, duration, and intensity of a storm, along with variability within the drainage area including soil moisture, temperature, snow cover, and a multitude of other smaller variables all contribute to the actual volume of runoff discharging at each monitoring station. Actual runoff volumes recorded during storms will be used to refine the runoff coefficient between events and over the course of the program to predict runoff and produce trigger volumes that will most consistently result in composite samples of adequate volume and that are representative of the storm more accurately.

4.1.5 Wet Weather Discharge Sample Collection

4.1.5.1 Sampling Team

Sampling team assignment will be decided once the decision is made to target a storm for a sampling event. The team will consist of two persons, a sample team leader and a sample technician. The sample team leader will serve as the Site Safety Officer during sampling events. When storm event runoff begins, the consultant Field Coordinator will confer with the Stormwater Quality Specialist and mobilize the sampling team. A meeting location for the team will be chosen based on sampling team proximity to the monitoring station. The sampling team will be responsible for the following:

- Collecting field parameter measurements
- Collecting laboratory analytical grab samples
- Verifying operation of the automated sampling equipment
- Collecting sample duplicates and/or preparing field blanks, as required
- Delivering grab and composite samples to Boise City Water Quality Laboratory (WQL)
- Returning grab sampling equipment to ACHD headquarters

4.1.5.2 Grab Sample Collection

Grab sample collection will be accomplished by the sample team leader. The sample team leader will fill grab sample bottles in accordance with the applicable procedures listed in Appendix A. Immediately following sample collection, the sample technician will record the collection date, time, and sample identification on the sample containers and on a Grab Sample Data Form (Appendix B). Additional sampling information recorded on the Grab Sample Data Form includes field parameter measurements and the corresponding meter used, status of the automated sampler, and other comments and observations.

Field parameters including temperature, pH, conductivity, and DO will be measured in the field using handheld instruments to avoid changes that may occur between the time when the sample is collected and the time of the analysis. Measurements from these field tests will be recorded on the Grab Sample Data Form included in Appendix B.

4.1.5.3 Composite Sample Collection

Collecting flow-weighted samples throughout a storm event is facilitated using automated sampling equipment. During station setup, the interface module is programmed for a site- and event-specific trigger volume. The automatic sampler is linked to the interface module via a data cable. When the flow module records the trigger volume amount, the interface module triggers the sampler to take a sample. The integrated peristaltic pump on the automatic sampler engages and draws a sample through the tubing installed in the invert of the storm drain pipe. The sample aliquot is pumped into the composite sample bottle secured in the base of the automatic sampler. If automatic compositing of samples is not possible due to issues with equipment or other difficulties, manual composites may be collected. Procedures for manual composite sample collection are listed in Appendix A.

The sampler program will end automatically after the last programmed subsample has been collected (typical target of 24 subsamples). Immediately following collection of the sample container, the sample team will record the collection date, time, and sample identification on the sample bottle and the Composite Sample Collection Form (Appendix B).

Variability between expected runoff amounts and measured runoff amounts are common. To increase the probability of collecting a representative sample, a conservative approach to setting up the composite sampler is used. The minimum volume required by the WQL to run the analyses identified in Table 4-1 is 8 liters. In order to collect a representative composite sample, the sampler is programmed to collect 24 aliquots at 620 milliliters (mL) per aliquot. This approach will provide a minimum of 16 subsamples with a conservative estimate of forecasted rainfall. It will also provide additional capacity to collect up to 8 more aliquots in the event the intensity and duration of the storm is more than expected.

4.1.6 Monitoring Station Shutdown

Post-sampling activities include downloading data from flowmeters, samplers, and rain gauges according to the applicable procedures listed in Appendix A, removing/replacing batteries where necessary, and reviewing the overall condition of the equipment. Equipment shutdown will be conducted by ACHD personnel and may occur as late as 2 weeks after sample collection to accommodate hydrologic data collection.

The WQL will analyze the samples for the components of concern identified in Table 4-1. Quality assurance (QA) activities, to be performed by the program QA/QC officer, will include review of field notes and COC documents, as well as validation of data packages received from the laboratory. QA/QC procedures are discussed in further detail in Section 5.

4.2 Dry Weather Outfall Screening Procedures

4.2.1 Weather Information and Field Preparation

Dry weather outfall screening requires an antecedent dry period of 72 hours or more of 0.10 inch or less of precipitation. To meet this criterion, staff will verify the antecedent dry period by accessing continuous weather observations published by the National Weather Service (NWS) for the weather monitoring station located at the Boise Airport and supplement with ACHD rain gauges as needed. While confirming the antecedent dry period, staff will also check the forecast for the area where work is planned to ensure acceptable and safe weather conditions are present during screening.

Field equipment and supplies may vary based on the location and type of terrain expected to access outfall(s) scheduled for investigation. If accessibility to an outfall is restricted, arrangements to gain access through traffic control measures or property site ownership will be put in place. Prior to initiating investigation activities, field staff will perform a cursory check of all equipment to be used to verify proper function and safe operation. Necessary supplies including field investigation forms and sampling and testing supplies will be restocked as necessary and kept in a clean and secure location between investigations.

4.2.2 Visual Dry Weather Inspections

The information obtained during dry weather visual inspections sets the foundation for outfall investigation activities. These inspections are the main methods for discovery of illicit discharges to the MS4. A visual dry weather inspection consists of verification of the pipe size, material, and configuration that ACHD has in their records for the outfall and its conveyance, as well as qualitative descriptions of the conditions present at the time of the inspection. Inspections also include a review of records from past visits to identify persistent or new conditions.

Upon arrival at the outfall, ACHD personnel will conduct physical observations in the order listed on the digital Outfall Investigation Form (Appendix B). Information to be collected for each outfall includes:

- Location, in terms of a description of the nearby streets, receiving water, and other landmarks useful in identifying and locating the outfall.
- Description of major land uses in the outfall drainage area
- The configuration, construction, dimensions, material, and condition of the outfall
- Visual observations of the outfall and surrounding area including the staining, sedimentation, scour, and vegetation condition
- Observed flow characteristics (clarity, odor, color, floatables, intensity and volume of flow)
- Presence of trash in or from the outfall
- Photographs of the outfall, surrounding area, flows, if present, and any other features or conditions useful or pertinent to the outfall inventory, screening activities, or reporting

Any other information useful in source tracing will also be recorded on the Outfall Investigation Form (Appendix B). Sample collection will be scheduled for a later date (not to exceed 15 days from discovery) due to advance notice requirements at the WQL. Sample collection and flow measurement methods are described in the discharge monitoring section below.

4.2.3 Dry Weather Discharge Monitoring

4.2.3.1 Analytical Sample Collection Frequency

Samples, measurements, and/or assessments conducted in compliance with the Permit must be representative of the nature of the monitored discharge. As such, dry weather discharge monitoring will be conducted on all flowing outfalls on an annual basis. Outfalls with unknown sources or have exceedances above established trigger threshold levels may be sampled up to two additional times per year. Table 4-2 below illustrates the trigger threshold levels used for this program. The source tracing flow chart in Appendix F will be used in conjunction with analytical results, field observations, and drainage area analysis to identify likely source(s) of illicit discharges or illegal connections.

If an *E.coli* result exceeds 406 MPN/100mL, then four additional *E.coli* samples will be collected within a 30-day timeframe. All five results will be used to calculate a geometric mean which will then be compared to the trigger threshold listed below.

Table 4-2. Thresholds for Water Quality Parameters

Constituent	Threshold	Basis	Source
pH	6.5 – 9.0	Idaho Aquatic Life	IDAPA 58.01.02.250.01.a
Temperature	22^0C 19^0C	Salmonid Spawning – Peak Salmonid Spawning – Max. daily average	IDAPA 58.01.02.250.02b
Turbidity	Not to exceed 50 NTU above background - instantaneous	Idaho Aquatic Life	IDAPA 58.01.02
Dissolved Oxygen	6.0 mg/L	Salmonid Spawning	IDAPA 58.01.02.250.02a
Conductivity	>50 uS and <1500 uS	Typical US River Observations	EPA
Total Chlorine	0.019 mg/L CMC[1] 0.011 mg/L CCC[2]	Idaho Aquatic Life	IDAPA 58.01.02

Constituent	Threshold	Basis	Source
Total Copper	1.0 mg/L 1.3 mg/L	National Primary Drinking Water National Secondary Drinking Water	IDAPA 58.01.02
Total Phenols	21 mg/L	Idaho Human Health Consumption (Water/Organism)	IDAPA 58.01.02
E.coli	406 MPN/100 mL	Idaho Criterion for Primary Contact Recreational; single sample	IDAPA 58.01.02.251.01.c
Total Suspended Solids	80 mg/L (14 day)	Idaho Aquatic Life; Lower Boise River TMDL 14-day target	Lower Boise River TMDL (1999)
Total Phosphorus	0.07 mg/L	Eutrophication	Boise River TMDL
Dissolved Orthophosphate	0.07 mg/L	Guideline threshold – no specific criteria	
Detergents as Surfactants	Presence	Indicative of illicit connection – should not be present in dry weather flows	

[1]Criterion Maximum Concentration (CMC) - maximum instantaneous concentration or one hour average concentration of a toxic substance

[2] Criterion Continuous Concentration (CCC) – the four-day average concentration of a toxic substance.

4.2.3.2 Dry Weather Discharge Parameter Analysis

The analytical methods planned for use in discharge monitoring when flows are present are included in Table 4-3. The Permit requires that sample collection, preservation, and analysis be conducted according to sufficiently sensitive methods/test procedures approved under 40 CFR Part 136, 40 CFR subchapters N or O, or an alternative method that has been approved by EPA. As such, the identified methods are the selected and preferred options. Sample, laboratory, or instrument conditions, however, may require the substitution of an alternate Part 136 method.

The analytical requirements for dry weather discharge samples are listed in Permit Part 3.2.5.3. Water quality data will be collected using a combination of field parameter measurements using handheld meters, field analysis conducted by field screening staff, and laboratory analysis. Table 4-3 identifies the constituents to be identified, analytical method, and type of analysis.

Table 4-3. Analytical Methods for Dry Weather Discharge Constituents

Constituent	Analytical Method	Sample Analysis Type
pH	EPA 150.1	Field Parameter
Temperature	EPA 170.1	
Turbidity	EPA 180.1	
Dissolved oxygen (DO)	SM 4500 G	
Conductivity	EPA 120.1	
Total chlorine	DPD[1]	Field Analytical Test
Total copper	bicinchoninate hydrosulfide reduction	
Total phenols	4-aminoantipyrine	

Constituent	Analytical Method	Sample Analysis Type
E. coli	IDEXX Colilert	Laboratory Analytical Test
Total suspended solids	SM 2540 D	
Total phosphorus	EPA 200.7	
Dissolved orthophosphate	EPA 200.7	
Surfactants (detergents)	SM 5540 C	

[1]DPD = N,N Diethyl-1,4 Phenylenediamine Sulfate

4.2.3.3 Dry Weather Discharge Sample Collection

Samples will be collected using grab sampling methodologies from a point near the center of the flow at the outfall. If access to the outfall is restricted due to safety hazards, fencing, etc., samples may be collected from the nearest point to the outfall via a storm drain manhole or sand/grease trap. Traffic control and a sampling team are used if the collection site is within the right-of-way or could cause a hazard to pedestrians. The SOPs for grab sample collection are included in Appendix A. Samples will be collected for each constituent or suite of constituents in the containers listed in Table 4-4. Immediately following sample collection, the field personnel will record the collection date, time, and sample identification on the sample containers and on the digital Outfall Investigation Form (Appendix B).

Field Analytical Samples

Field analyses including total chlorine, total copper, and total phenols will be conducted using the Hach Stormwater Test Kit. Analysis will be completed within 30 minutes of sample collection. Each analysis will be conducted following the procedures outlined in the Hach Stormwater Test Kit manual. The specific test procedures from the manual have been incorporated into Appendix A. Results of field analyses will be recorded on the digital Outfall Investigation Form. If field analyses testing yields a positive result, a duplicate test is conducted to confirm the result.

Field Parameters

Field parameters including temperature, pH, conductivity, DO, and turbidity will be measured in the field using handheld instruments to avoid changes that may occur between the time when the sample is collected and the time of analysis at the laboratory. The following parameters: pH, conductivity, DO, and temperature will be measured by placing the handheld instrument in either a glass sample container or, if site conditions allow, directly in the stream of flow. Measurements from these field tests will be recorded on the digital Outfall Investigation Form.

4.2.3.4 Discharge Flow Measurement

Flow measurements will be collected when discharges are present to properly document flows and to aid in pollutant loading estimates. Anticipated flow measurement methodologies include use of pipe dimensions in conjunction with velocity probe measurements, bucket testing, or visual qualitative assessment. A full description of each flow measurement method is included in the flow measurement SOPs found in Appendix A.

For relatively small discharges, a bucket flow test may be used in which either a 1 L or 4.3 L container is placed under the outfall to capture all flow from the outfall for a measured amount of time. This information is then used to calculate flow in cubic feet per second.

For higher flows, the velocity probe is used to obtain an average velocity measurement for the flow. The average velocity is combined with measurements of the area of the flow profile to calculate discharge in cubic feet per second. The SOP includes the measurement and calculation approach for circular pipes, elliptical pipes, and natural or irregular channels.

In situations where flow is present and the outfall is not physically accessible, a qualitative assessment of flow will be recorded and accompanied by a comment stating that the outfall was inaccessible for flow measurement. Qualitative flow assessment will be described using three descriptive categories: trickle, moderate, or substantial. Guidance in the flow measurement section of Appendix A defines each of the qualitative flow measurement terms that will be used and provides guidance for selecting the most appropriate descriptive term.

4.2.4 Dry Weather Flow Source Tracing

After completing the dry weather discharge sampling, discharges from flowing outfalls will be traced to the source of the flow. Finding the source of the discharge often provides important information to help determine whether the discharge is allowable under Permit Part 2.4.5.1. Allowable non-stormwater discharges include the following:

- Discharges covered under a separate NPDES permit
- Discharges resulting from a spill or from unusual and severe weather or an emergency
- Discharges consisting of uncontaminated water and not sources of pollution to waters of the U.S

Sources will be traced by following the network of drop inlets and manholes upstream of the outfall using field maps showing the drainage system. Smoke testing, dye testing, and closed-circuit TV will be used as appropriate to determine the source of the discharge.

4.3 Sample Handling Procedures

The required types of containers and holding times for the monitoring constituents are dependent upon the constituents to be analyzed. Table 4-3 lists container types and holding times for each parameter group.

Preservation techniques in the field are limited to cooling samples to a target sample temperature of less than 6 degrees Celsius (°C) but above freezing. Five to ten pounds of food-grade ice will be placed in the bases of the automatic samplers during station setup. Sufficient ice will also be placed in coolers used for grab and composite sample transport to maintain the samples at a maximum temperature of 6°C.

No chemical preservation measures are required in the sample collection process. The WQL will add chemical preservatives after the composite samples are split as necessary for analysis. In the 15-liter carboy, composite samples have a holding time of 48 hours. Analysis of composite samples will include the parameters listed in Table 4-1.

The EPA standard method for measurement of dissolved metals, including dissolved orthophosphate, requires samples to be filtered within 15 minutes of sample collection. Grab sample collection for dissolved orthophosphate will be filtered in the field using a peristaltic pump and laboratory-prepared filters and tubing. Sample filtration will be performed following the procedures outlined in the field filtering SOP in Appendix A. The WQL has committed to splitting composites and filtering dissolved metals samples at the time of submission to the laboratory when they are submitted during normal business hours, and within 24 hours when samples are submitted after hours. Samples filtered within the 24-hour timeframe will not be qualified as estimates in the context of the program-established data quality objectives discussed in Section 5.2. If filtration is not accomplished within 24 hours of collection, results will be rejected.

The WQL has committed to providing *E.coli* analysis within the holding time for samples submitted during normal business hours (Monday–Friday), and within 12-16 hours if samples are submitted after hours. Due to the variable nature of storm event timing, *E.coli* grab samples are sometimes analyzed outside of sample holding times required by the standard method (8 hours). *E. coli* samples analyzed within the 8–6-hour timeframe will be qualified as estimated in the context of the program-established data quality objectives discussed in Section 5.2. If analysis is not initiated within 16 hours of collection, results will be rejected.

Table 4-4. Sample Handling Requirements

Constituent	Container	Holding Time
Composite Samples		
Ammonia Total Kjeldahl nitrogen (TKN) Nitrite plus nitrate (NO_2+NO_3) 5-day Biological oxygen demand (BOD_5) Chemical oxygen demand (COD) Arsenic – total Cadmium – total and dissolved Copper – dissolved Lead – total and dissolved Mercury – total Zinc – dissolved Turbidity Hardness (as $CaCO_3$) Total phosphorous Dissolved orthophosphate Total suspended solids	15-liter LDPE carboy	48 hours (in carboy)
Grab Samples		
E. coli	500 mL sterilized high-density polyethylene	8 hours
Total suspended solids	4.3 L plastic	7 days
Total phosphorus	500 mL plastic	28 days
Dissolved orthophosphate	250 mL plastic	48 hours
Surfactants (detergents)	1 L plastic	48 hours
Field Parameters		
Dissolved oxygen Temperature pH Conductivity	2 L clear glass	Field analysis

4.4 Chain-of-Custody Procedures

Standard chain of custody (COC) forms, shown in Appendix B, will be completed prior to submitting samples to the laboratory. Information recorded on the COC includes the following:

- Sample collection team member names
- Sample identification
- Sample type (grab or composite)
- Analyses requested
- Start and stop times
- Sample start and end date

A sample is "in custody" if it is either in actual physical possession of authorized personnel or in a secured area that is restricted to authorized personnel. Such areas include laboratory refrigerators, the ACHD stormwater monitoring lab, ACHD office space, consultant office space, ACHD vehicles, and consultant vehicles. Automatic samplers at monitoring stations are installed in locking enclosures. All transfers of custody will be recorded by signature, date, and time by both the individual relinquishing custody and the one receiving custody. This information is placed in the designated area on the bottom of standard COC forms.

Samples may be stored overnight (in coolers with ice) at the ACHD stormwater monitoring lab while awaiting submittal to the laboratory. The COC forms must be reviewed and signed by at least one of the persons who collected the samples listed on the COC form. The COC forms will be delivered to the laboratory with the samples.

If samples are submitted to the laboratory during business hours, samples are relinquished to laboratory personnel in person for immediate receipt with signature, date, and time. ACHD has after-hour access to the laboratory to accommodate sample submittal. When sample delivery occurs after hours, grab samples are placed in a locked refrigerator and composite samples are stored in coolers or sample bases and packed with ice. The team delivering the samples will notify a laboratory representative that the samples have been dropped off and the time the earliest samples were collected. A signed COC form is left in the locked laboratory for morning receipt by laboratory personnel.

Wet weather analytical samples will be named using the date of the event, followed by the station number, followed by WG or WC for “Wet Grab” or “Wet Composite,” respectively. For example, a composite sample collected at State on November 30, 2021, would be labeled 211130-18-WC.

Dry weather analytical samples will be named by the outfall identification number from which the sample was collected. For example, 3n1e17_006.

Sample collection times for quality control (QC) samples will be recorded as 12:00 on the COC form to maintain duplicates as laboratory blind samples. The actual collection time will be recorded on the field form. The QAPP includes more detail on the approach to data validation as it pertains to holding times and laboratory qualifiers for QC samples.

Section 5

Quality Assurance/Quality Control

5.1 QC Sampling Schedule

The QC sampling schedule developed for the Plan consists of a combination of field QC samples and laboratory QC samples. Field QC sample types are described in the QAPP. Field QC sampling intervals will follow the schedule detailed in Table 5-1. Laboratory QC sample results are included in each analytical report.

Table 5-1. QC Sample Collection Frequency

QC Sample Method[1]	Sampling Frequency	Percent of Total Data Represented
E.coli duplicate and field blank	1 set per year	33%
Composite sample duplicate[2]	1 composite per year	33%
Composite sample field blank	1 composite per year	33%
Composite sample equipment blank[3]	1 composite per year	100%
Composite sample rinsate blank[3]	1 composite per year	100%
Dry Grab sample duplicate and field blank[4]	1 set per 20 samples[5]	5%

[1]Grab QC samples will be analyzed for grab sample constituents. Composite QC samples will be analyzed for composite sample constituents.

[2]The composite sample duplicate will be collected at the earliest opportunity and is contingent upon sample volumes.

[3]Composite blanks will be collected during monitoring station maintenance events and will be analyzed for composite sampling constituents.

[4]Dry grab QC sample analysis will be performed on laboratory analytical samples only. Analyses conducted by ACHD in the field rely on calibration and accuracy check methods described in Section 3.

[5]Dry grab QC frequency is determined by the number of screening program samples collected, regardless of result.

Random number generation is used to develop a QC sample schedule for the permit term. The schedule will be used to establish the targeted event in which to collect the QC samples. Each targeted storm event is assigned a number and a random number generator equation is run for each year. The full QC schedule along with an explanation of the randomization method is included in Appendix C.

ACHD may choose to conduct additional QA/QC to address data discrepancies, potential sample contamination, or other QA/QC issues. These events will be handled on an as-needed basis, depending on the issue(s) involved.

5.2 Data Quality Objectives (DQO)

The DQO for ACHD monitoring can be summarized by the following statement:

Monitoring efforts will provide data of sufficient quality and quantity in accordance with permit requirements to accurately estimate pollutant concentrations and loading trends, detect and eliminate illicit discharges and illegal connections, and support watershed and land use management initiatives.

5.2.1 Data Quality Indicators (DQIs)

DQIs have been established to set measurable qualitative and quantitative goals for data acceptance that meet the program DQO described above. Each DQI is described below. DQIs are the basis for addressing field and laboratory analytical instrument performance, as well as sample collection and handling procedures. QA/QC samples provide input for several of the DQIs. QA/QC sample collection procedures are included in Section 2.1 of the QAPP.

DQIs are described fully in Section 1.8.1 of the QAPP. A brief description of each DQI is included in the list below.

- **Project Required Detection Limits (PRDL):** Achieving appropriate reported constituent concentration results at values that allow for comparison to baseline data and water quality standards.
- **Accuracy:** The accuracy of the data is a measure of the extent to which a measured value represents the true value.
- **Precision:** Precision is a measurement of the reproducibility of the analytical data.
- **Bias:** Bias is minimized by using standard data collection and analytical methods and protocols, as well as standard sample preservation, transport, and storage procedures.
- **Representativeness:** Representativeness is a measure of the degree to which data accurately and precisely indicate environmental conditions.
- **Comparability:** The comparability of a dataset is the extent to which data accurately and precisely indicate environmental conditions.
- **Completeness:** Completeness is a comparison between the amount of usable data collected versus the total amount of data collected.
- **Sufficiency:** Dataset sufficiency is the amount of data required to perform the level or type of analysis necessary for each monitoring element.

Analysis-specific data quality indicators include PRDLs and precision evaluated as relative percent difference (RPD). The target values for these indicators are listed in Table 5-2 below.

Table 5-2. Data Quality Indicator Targets

Constituent	Analytical Method	PRDL[1,2]	Units	Precision[3,4] (RPD)
Temperature	EPA 170.1	0.01	ºC	NA
pH	EPA 150.1	0.01	S.U.	NA
Dissolved Oxygen	SM 4500 G	0.01	mg/L	NA
Conductivity	EPA 120.1	0.1	μS/cm	NA
Ammonia (NH_3)	SM 4500 NH3-N	0.045	mg/L	20%
Total Kjeldahl Nitrogen (TKN)	Perstorp PAI-DK01	0.3	mg/L	20%
Nitrite plus Nitrate (NO_2+NO_3)	EPA 353.2	0.04	mg/L	20%
Total Phosphorus	EPA 200.7	0.04	mg/L	20%
Dissolved Orthophosphate	EPA 365.1 or SM 4500-P E	0.084	mg/L	20%
E. coli	IDEXX Colilert	1.8	MPN/100mL	40%[5]
5-Day Biological Oxygen Demand (BOD_5)	SM 5210 B	2.2	mg/L	20%
Chemical Oxygen Demand (COD)	Hach 8000	6	mg/L	20%
Total Suspended Solids (TSS)	SM 2540 D	1.0	mg/L	20%
Total Dissolved Solids (TDS)	SM 2540 C	25	mg/L	20%
Turbidity	EPA 180.1	0.2	NTU	20%
Arsenic – Total	EPA 200.7	0.05	mg/L	20%
Cadmium – Total	EPA 200.7	0.02	mg/L	20%
Cadmium – Dissolved	EPA 200.7	0.2	mg/L	20%
Copper – Dissolved	EPA 200.7	0.2	mg/L	20%
Lead – Total	EPA 200.7	0.02	mg/L	20%
Lead – Dissolved	EPA 200.7	0.2	mg/L	20%
Mercury – Total	EPA 245.2	0.02	mg/L	20%
Zinc – Dissolved	EPA 200.7	0.2	mg/L	20%
Hardness (as $CaCO_3$)	SM 2340 B	1	mg/L	20%
Turbidity	EPA 180.1	0.1	NTU	20%
Total chlorine	DPD[6]	0.1	mg/L	NA
Total copper	bicinchninate hydrosulfide reduction	0.1	mg/L	NA
Total phenols	4-aminoantipyrine	0.1	mg/L	NA
Surfactants (detergents)	SM5540C	1.0	mg/L	20%
Flow/Discharge Volume	Non Specific	0.001	CFS	NA
Precipitation	Non Specific	0.01	in	NA

[1]*Field instrument resolution values are listed in lieu of a PRDL for field parameter measurements.*

[2]*PRDL is defined as the effective method detection limit (MDL) as reported by the analytical laboratory.*

[3]*Precision calculations based on field duplicate samples.*

[4]*In cases where one value is reported at the MDL and the other value is less than five times the MDL, the samples will be considered within acceptable precision limits.*

[5]*E. coli is evaluated using the RPD of logarithmic parent and duplicate values. The acceptable RPD between the two values is also higher than other constituents. These changes are in place to accommodate the inherent variability in E.Coli samples.*

[6]*N,N Diethyl-1,4 Phenylenediamine Sulfate*

Anticipated issues with optimal performance for DQIs include high potential for holding time exceedances with *E. coli* as well as meeting the method-required filtration holding-time for dissolved orthophosphate in composite samples. These issues will be monitored closely from the outset of the wet weather discharge monitoring program to track and understand the impact these deviations may have on DQIs.

5.2.2 Storm Event Acceptance Criteria

Acceptance criteria for a representative storm are derived from Permit requirements for representative sampling as stated is Permit Part 6.2.3 and target volume and duration goals established for this program. Storm data used to evaluate acceptance, including antecedent dry period, precipitation amount, and flow volumes will be measured based on data records at the site-specific rain gauges and flowmeters.

Additional acceptance criteria for composite samples are based on the total amount of runoff represented by the composite sample. Ideally, upon completion of the sampler program, a flow-weighted composite sample is collected that represents the entire duration of the storm, or at minimum, the first six hours of the storm. However, in some cases, high rainfall amounts result in the automatic sampler program completing early before the storm duration requirement is met. When this situation occurs, the full composite bottle is removed from the sampler, a second bottle is installed, and the sampler program is restarted. All sample bottles filled at a particular station will be composited at the WQL. This composite sample is flow-weighted for the portion of the storm event that was sampled.

In some instances, there will be an unavoidable gap in collection time of the flow-weighted composite sample because of logistical constraints in reaching the monitoring station at the exact time the first sample bottle is full. The portion of the storm event that is represented by the composite sample can be determined from a review of the storm hydrograph at each location. The sample will be considered valid and unqualified when at least 75 percent of the total hydrograph is represented by the composite sample and the first hour of runoff is included. If the composite sample is not representative of at least 75 percent of the measured flow associated with that storm and does not cover the minimum duration described above, the sample will be qualified, and data will be considered an estimate based on the DQOs outlined earlier in this section. Another storm may be targeted to replace it if possible.

On a limited number of historic occasions, an automatic sampler has triggered before the beginning of storm event runoff. In the event of this occurrence, the extraneous aliquots will be considered not to have compromised the entire composite sample if it represents less than 10 percent of the total composite sample volume (typically one to two subsamples). If the composite sample is determined to be comprised of 10 percent or more non-stormwater sample, the entire composite sample will be rejected.

Section 6

Data Management and Reporting

All data collected as part of the Plan will be stored in electronic format for secure storage and timely and accurate retrieval for data interpretation, graphing, and reporting. Data collected as part of the monitoring program will include rainfall data, runoff volumes, runoff coefficients, field analytical data, laboratory analytical data, QA/QC results, and qualitative observations. All data will be formatted according to preset standards to interface with the developed database storage and parameter evaluation procedures. Specific reporting procedures are provided below.

6.1 Data Acquisition Requirements (Non-Direct Measurements)

Weather forecasts and hourly precipitation totals will typically be obtained from the NWS Boise airport station website at https://forecast.weather.gov/MapClick.php?lat=43.60764000000006&lon=-116.19339999999994#.YFtOxK9KhPY. Additional forecasts or weather reports may be obtained from local media, community, commercial weather services, or ACHD-owned rain gauges. When obtaining weather forecasts for storm events, the Stormwater Quality Specialist will typically call the NWS Boise airport station for additional details if it appears that an approaching storm may meet the sampling criteria. Pertinent details of these conversations will be relayed to the sampling team and laboratory personnel.

6.2 Data Management Systems

6.2.1 Wet Weather Discharge Monitoring Data Organization

ACHD uses Seveno DataSight (DataSight) data management software for handling data. The intent of using this program to manage and store data is to provide a safe and secure platform for storing, viewing, validating, and analyzing data. Program data will be imported into the database according to established procedures listed in Appendix A, and in the database guidance document discussed below. ACHD will utilize the database to assist with implementation of the QAPP and this Plan.

The DataSight database is configured in four tiers or “levels” under which data is stored and related. The database structure and level dependencies for the wet weather discharge monitoring program are illustrated in Figure 6-1 below.

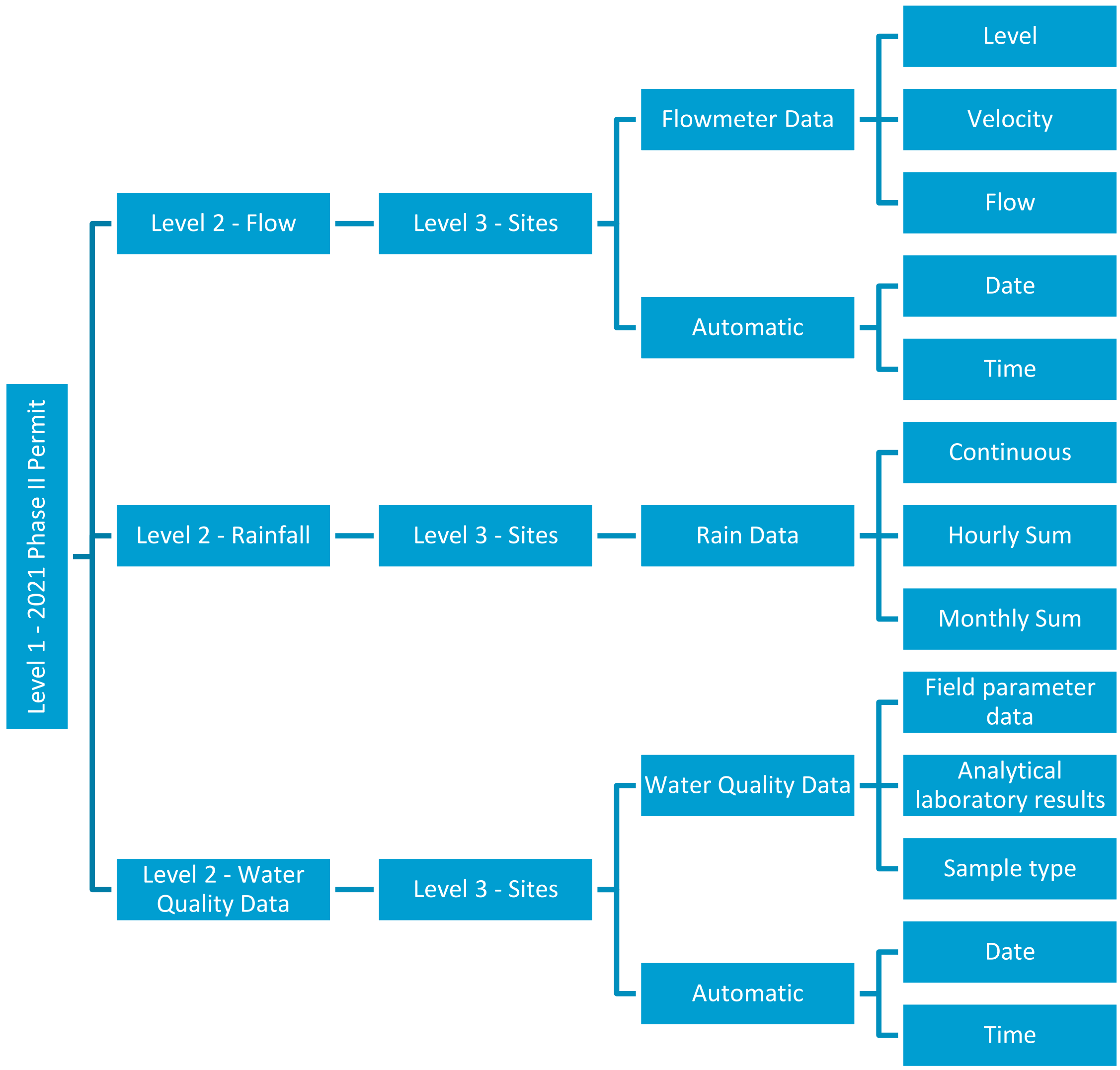

Figure 6-1. Database Levels Setup

The *ACHD Database Guidance Document* (BC, 2014) was created to provide an overview of the organization of the database. The guidance document further describes data and program relationships as well as the various functions and capabilities available within the DataSight software. Specific features discussed in the guidance document include the following:

- Organization of data within the levels of the database
- Organization and grouping of variables into data types
- Conversions and calculations ACHD will carry out in the database
- Approach to tying information to individual sites and specific events
- The use of control documents and site properties menus for storing program documents and other important records
- Data import functions to be utilized
- Data analysis, reporting, and export functions that will be utilized for retrieving data for subsequent use
- Quality Assurance/Quality Control (QA/QC) measures and validation

- Data security including information about the ACHD secure servers, access restrictions, and automatic audit logs

6.2.2 Dry Weather Screening Data Organization

ACHD uses a combination of ArcGIS®, Survey123 for ArcGIS®, and Microsoft Excel to manage the outfall inventory including locations, screening records, and sampling results. Data associated with the dry weather outfall screening program is stored in the ArcGIS Cloud and saved in separate Excel spreadsheets on the secure ACHD network. The data is stored as an Outfall Database which provides folders that include, but are not limited to, the following elements:

- Date of most recent precipitation event greater than 0.1 inches of rain
- Quantity of most recent rain event greater than 0.1 inches of rain
- Site description (conveyance type, dominant watershed land uses)
- Flow estimation (width of water surface, depth of water, approximate flow velocity, approximate flow rate)
- Visual qualitative observations (odor, color, clarity, floatables, deposits/staining, biology, condition of vegetation, structural condition of outfall, qualitative flow)
- Sample results: field parameter, field analytical, and laboratory analytical
- QA/QC records and results
- Outfall photographs
- Changes to the outfall inventory such as new outfalls, removed/abandoned outfalls, and change of ownership
- Narrative description of flow tracing, determination of discharge authorization (allowable or illicit), and documentation of any corrective measures including stopping the discharge, disconnecting illegal connections or other enforcement and escalation activities
- Maintenance activities related to outfalls

In addition to the outfall inventory, a GIS map of the MS4 will be maintained on a continuous basis. This includes the location of all inlets, catch basins, outfalls (including a unique identifier for each outfall), pipes, open channel conveyances, flood control devices, waterbodies, permanent stormwater controls, and ACHD-owned storage facilities and maintenance yards.

6.3 Data Reporting

As required by Permit Part 6.4, ACHD must submit reports on both an annual basis and after the 5-year Permit term. The reports summarizing the monitoring efforts and findings over the entire Permit term are to be submitted as an attachment to the Permit Renewal Application.

6.3.1 Permit Renewal Application

6.3.1.1 Monitoring/Assessment Report

As required by Part 6.4.3 of the Permit, a final report summarizing any/all monitoring/assessment data collected during the permit term will be submitted as an attachment to the Permit Renewal Application. The final report will summarize and evaluate the information collected and include the following:

- The date, exact place, and time of sampling or measurements
- The name(s) of the individual(s) who performed the sampling or measurements
- The date(s) analyses were performed
- The names of the individual(s) who performed the analyses

- The analytical techniques or methods used
- The results of such analyses, including both visual and narrative summary interpretation of the data collected, a discussion of any quality assurance issues, and a narrative discussion comparing data collected to any previously collected or historical information, as appropriate

6.3.1.2 Outfall Inventory

As stated in Permit Part 3.2.6.2, a complete list of Permittee-identified MS4 outfall locations with ongoing dry weather flows associated with irrigation return flows and/or groundwater seepage will be included as part of the Permit Renewal Application. Additionally, an electronic GIS version of the MS4 map will be submitted.

6.3.2 Annual Reporting

As required by Permit Part 6.2.4, an annual report reflecting the status of the wet weather discharge monitoring and dry weather outfall screening programs will be submitted. This report will include the following components:

- Summary of the Permittee's efforts to date that address the MS4 discharges contributing to the original water quality excursion, including the results of any monitoring, assessment, or evaluation efforts conducted during the reporting period
- Total number of MS4 outfalls in ACHD's jurisdiction of the Permit area
- Confirmation that at least 50 outfalls received a visual dry weather inspection
- Number of outfalls that:
  - discharge during dry weather
  - were sampled or otherwise investigated to determine the discharge source
  - resulted in action to address and eliminate the discharge source
  - identified to have flows caused by irrigation return or ground water seepage
- List of all receiving waters for the MS4 discharges

6.3.3 Storm Event Reporting

Ongoing summaries of each storm event will be used as support for the annual report and the final monitoring/assessment report. Following each sampling event, a storm event report capturing the results of all sampling conducted will be prepared by the consultant. The report will also provide a specific summary of the storm characteristics and monitoring activities and will include the following data and control documents:

- Storm Event Information
  - storm event specific ID number
  - date and time span of the storm
  - antecedent dry period
  - total rainfall
  - flow summary and statistics for the site
  - a qualitative description of the forecast and storm
  - composite sample volume
  - trigger volume used
- Water Quality Data

  - field parameter measurements
  - laboratory analytical data
  - QC sample results
  - storm event pollutant loading estimate (described below)
- Flow Data
  - storm event flow total
- Rain Data
  - storm event precipitation total
- Control Documents
  - laboratory analytical report
  - data validation checklist

Additionally, each storm event report will include the following report elements:

- Project status summary table
- Discussion of QA/QC analysis
  - storm acceptance criteria
  - results of the data validation review for the event
- Discussion of stormwater management activities in the drainage area
- Narrative summary of notes from the current event and recommendations for the next event
- Event hydrograph for the monitoring station

Storm Event Pollutant Loading Estimates

Pollutant loading estimates for each event will be calculated using the following formula when complete runoff volume measurements are available.

$$L = 6.24E^{-5} * F * C$$

Where:

L = Event Load (pounds)

F = Event Runoff (cubic feet)

C = Pollutant Concentration (mg/L)

6.24 E^{-5} = Unit conversion factor

When runoff volume must be estimated due to incomplete flow measurements, the Simple Method approved by the EPA for simple pollutant loading estimations for urban stormwater will be used. The following is the equation that will be used to estimate the event pollutant loads if measured flow volumes are not available or are incomplete.

Simple Method

$$L = 0.226 * R * C * A$$

Where:

L = Event Load

R = Event Runoff (inches)

C = Pollutant Concentration (mg/L)

A = Area (acres)

0.226 = Unit conversion factor

Runoff Calculation

$$R = P * Pj * Rv$$

Where:

R = Event Runoff (inches)

P = Event Rainfall (inches)

Pj = Fraction of annual rainfall events that produce runoff (0.9)

Rv = Runoff Coefficient

The site-specific runoff coefficient (Rv), as presented in the EPA formula, is equal to the percent of impervious surface in the drainage area represented as a decimal. However, this does not account for impervious areas in areas without curb and gutter, canopy cover and interception, or stormwater controls in the drainage area. Therefore, the runoff coefficient variable in the equation will be refined as understanding of the drainage area is expanded.

6.3.4 Evaluation and Assessment

Evaluation and assessment of the wet weather discharge and dry weather outfall monitoring data will be in compliance with the general guidance identified in the Plan and the QAPP. Pollutant loads will be estimated based on measured flow and concentrations throughout the system. Data will be compiled with the objective to obtain sufficient data points for statistical and trend analyses to evaluate the effectiveness of stormwater management efforts at reducing pollutant loads from the MS4.

Section 7

References

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——, Quality Assurance Program Plan for NPDES Storm Water Permit Monitoring Boise and Garden City, Idaho, 2014.

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——, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act, Analysis and Sampling Procedures; Final Rule, Federal Register Vol. 77 No. 97. 40 CFR Parts 136, 260, et al., 2012.

——, Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, EPA 540 R 08 01, Office of Superfund Remediation and Technology Innovation (OSRTI), 2008.

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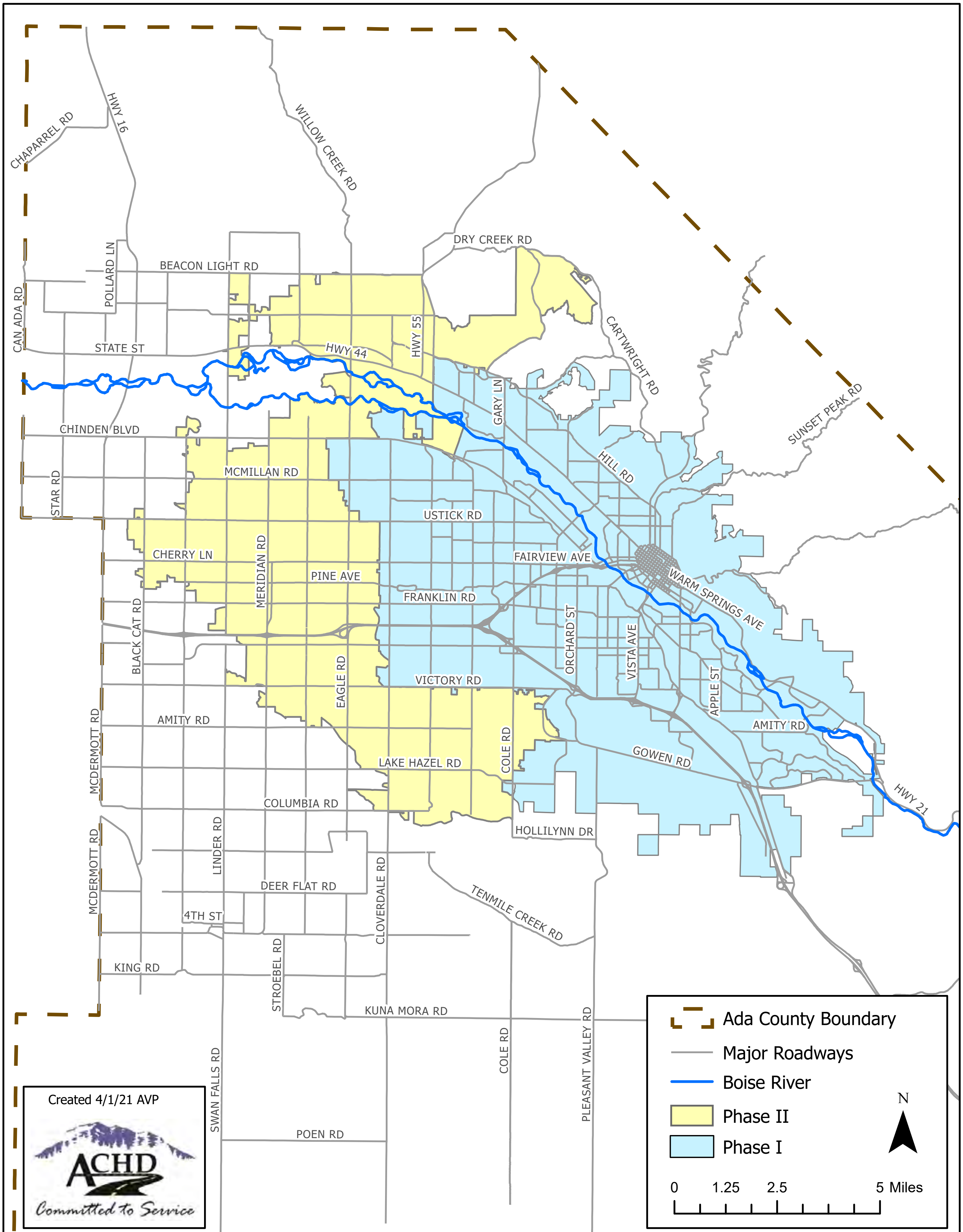
Figures

NPDES Permit Area

State Monitoring Site Subwatershed

Outfall Map

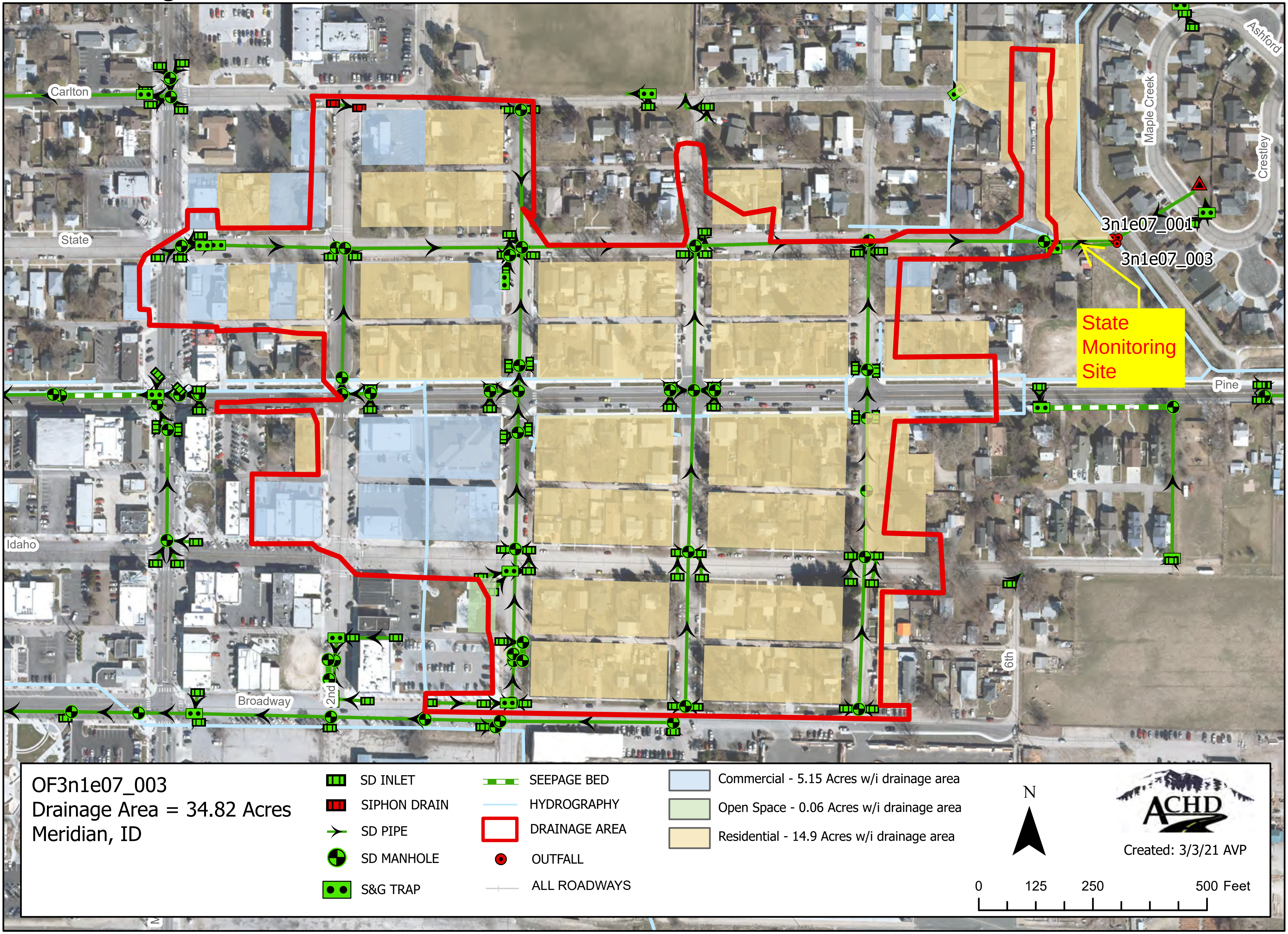
NPDES Permit Areas Map



File Location: \\APPWSUS\ACHDFiles\Groups\DVS\STORMWATER\Maps\Permit Areas Map\Permit Areas Map 04 01 21.aprx

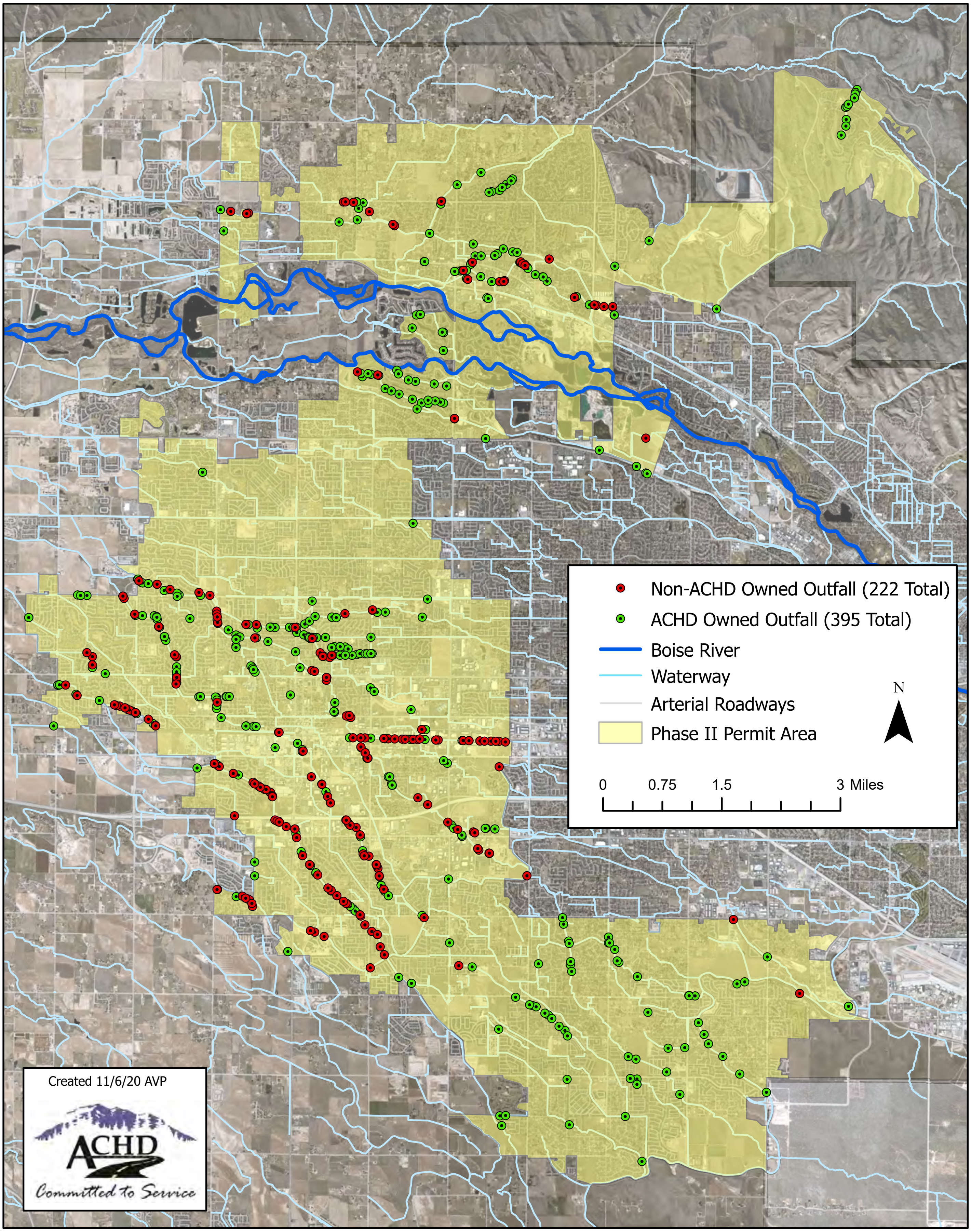
This Map is a representation of features on the ground and is not survey-grade accurate. ACHD will not be liable for any inaccuracies thereon.

State Monitoring Site Subwatershed



This Map is a representation of features on the ground and is not survey-grade accurate. ACHD will not be liable for any inaccuracies thereon.

Phase II Outfall Map



Appendix A: Standard Operating Procedures and Procedure Guidance

The following Standard Operating Procedure (SOP) and Procedure Guidance (PG) documents will be referenced as needed to assist with implementation of the Phase II Monitoring and Assessment Plan. The SOPs and PGs listed below are readily assessable by ACHD and consultant personnel for use in the field or in the office to complete tasks associated with the acquisition and management of data under the ACHD Monitoring Program.

SOP 110: Discrete grab sample collection

SOP 111: Low flow grab sample collection

SOP 112: Large volume grab sample

SOP 113: Manual composite sample collection

SOP 114: Field Filtering Procedures

SOP 116: Flow Estimate – Bucket Method

SOP 212: Flow Meter Data Access and Downloads Using Flowlink Software and ISCO Equipment

SOP 312: YSI Model 85 Dissolved Oxygen and Conductivity Meter

SOP 313: pH meter operation, calibration and maintenance

SOP 314: Gas Detector Operation and Calibration

SOP 318: Flow Probe Operation

SOP 321: Hach Stormwater Kit Operation

PG 116: Visual Flow Qualification

PG 211: Downloading data in the field using HOBOware Software

PG 319: Rain gauge inspection and maintenance

PG 512: Exporting data from Flowlink Pro

PG 530: Exporting data from HOBOware software

PG 532: Transferring ISCO data from Flowlink LE to Flowlink Pro

PG 533: Importing data into DataSight

PG 534: QA/QC Process in DataSight

Appendix B: Communication and Field Forms

Set-Up/Shut-Down Form

Grab Sample Data Form

Composite Sample Collection

Sampling Event Communication Form

Chain of Custody Form – Boise Water Quality Laboratory

Chain of Custody Form – Analytical Laboratory

Outfall Investigation Form

Set Up/ Shut Down Form – ISCO

STATION: ________________________________

SET UP

Personnel: ______________________________ **Date/Time On-Site: ____________________________**

Date	Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
Downloaded to:						
Trigger Condition:						
Flow Pulse Interval:						

On-Site
- ☐ Replace FM battery, install Sampler battery
- ☐ Perform Decon. Cycle
- ☐ Place 15L sample bottle in cooler, with ice
- ☐ Remove jar lid and put in clean re-sealable plastic bag
- ☐ Set Sampler program parameters (refer Table 103)
- ☐ Verify all cable and tubing connections
- ☐ Verify Sampler Program is running

Flowlink (Refer to Flowlink Instructions, if needed)
- ☐ Direct or Remote; Date/time ____________________
- ☐ Retrieve data and review recent flow history
- ☐ Change Wireless Power Control to Storm Event
- ☐ Change Data Storage Rates to 1 minute for Level, Velocity, and Flow
- ☐ Enable Sampler: On Trigger, and set velocity equation
- ☐ Set Latch
- ☐ Set Sampler Pacing to Flow Paced, and set trigger volume

Comments:

SHUT DOWN

Personnel: ______________________________ **Date/Time On-Site: ____________________________**

Date	Time	Level (in)	Flow (cfs)	Velocity (fps)	Total (cf)	Battery (V)
Downloaded to:						

On-Site
- ☐ Replace FM battery if v<11.9
- ☐ Remove battery from Sampler

Flowlink (Refer to Flowlink Instructions, if needed)
- ☐ Direct or Remote; Date/time ____________________
- ☐ Retrieve data
- ☐ Change Wireless Power Control to Dry Weather
- ☐ Change Data Storage Rates to 15 minutes for Level, Velocity, and Flow
- ☐ Enable Sampler: Never

Comments:

Grab Sample Data Form – PI and PII

STATION: ___________________________________

Personnel: _____________________________ **Date/Time On-Site:** ____________________________

Flow Meter Current Status						
Level (in)	Flow (cfs)	Total Flow (cf)	Velocity (fps)	Battery (V)	Flow Start (date/time)	Rainfall (in)

Grab Information				
	Site ID	Date	Time	Labeled?
Site *E.Coli*	-WG			☐
Field Duplicate *E.Coli*	-101			☐
Field Blank *E.Coli*	-001			☐

Field Parameters						
Meter number	Date	Time	Temp (C)	D.O. (mg/L)	pH (S.U.)	Cond (uS/cm)

Sampler Current Status	
First Subsample Date/Time	
Last Subsample Date/Time	
# of Subsamples taken	

Comments:

Date/Time Off-Site: ________________________________

Revised 200924 TL

Composite Sample Collection

STATION: ______________________________ **Bottle _____ of ______**

Personnel: ________________________________ **Date/Time On-Site: ___________________________**

☐ Halt Sampler program	
☐ Put lid on sample bottle; label sample bottle	
Sample ID:	-WC
Approx Sample Volume (mL):	
Clarity (ex. Clear, Cloudy, Silty):	
Color (ex. Clear, Gray, Tan, Brown, Black):	
QA/QC Sample ID:	-103 (Time: 1200)

Subsample Information

Trigger #	Date/Time	Sampler Message/ Subsample Result	Trigger #	Date/Time	Sampler Message/ Subsample Result
1			13		
2			14		
3			15		
4			16		
5			17		
6			18		
7			19		
8			20		
9			21		
10			22		
11			23		
12			24		

Comments:

If Sampling is Complete:

- ☐ Power off Samplers
- ☐ Disable Flow Meter pacing
- ☐ Resume Flow Meter program
- ☐ Verify Flow Meter is running
- ☐ Add ice to sample transport cooler
- ☐ Complete COC form; arrange transport to lab
- ☐ Current **Velocity Cutoff (fps):** ___________

If Continuing Sampling (sample bottle change-out):

- ☐ Keep Flow Meter running
- ☐ Install new 15L bottle; add ice
- ☐ Restart program from beginning;

Date/Time Restarted: ________________

- ☐ Verify running

Liquid Height vs. Approximate Sample Volume Conversion Chart

Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume	Liquid Height	Sample Volume
0.5”	400 mL	**3.0”**	3500 mL	**5.5”**	7250 mL	**8.0”**	11000 mL	**10.5”**	14750 mL
1.0”	800 mL	**3.5”**	4250 mL	**6.0”**	8000 mL	**8.5”**	11750 mL	**11.0”**	15500 mL
1.5”	1400 mL	**4.0”**	5000 mL	**6.5”**	8750 mL	**9.0”**	12500 mL	**11.5”**	16250 mL
2.0”	2000 mL	**4.5”**	5750 mL	**7.0”**	9500 mL	**9.5”**	13250 mL	**After 12”**	1” = 1500 mL
2.5”	2750 mL	**5.0”**	6500 mL	**7.5”**	10250 mL	**10.0”**	14000 mL	**Lab min**	8,000 mL

SAMPLING EVENT COMMUNICATION FORM

Date: 12 Nov 2020 **Time:** 8:13 AM **Initials:** TL

Sampling Event Determination

Is there a targeted sampling event expected during the next 36 hours?
(Or, if it is Friday, is a targeted event expected before 5:00 PM on Monday?)

(●) Yes ( ) Maybe ( ) No

If YES or MAYBE, then call BC. Include discussion of reasons for "Maybe" below.

- [x] Date and Time of Expected Event — 11/13/2020 12:00
- [x] Expected Amount of Precipitation
- [x] Percent Chance of Precipitation — 95% chance of 0.24" followed by 70% chance of 0.12"

Targeted Stations & Samples

Americana	Main	Lucky	AS-6	Whitewater
[x] Grab	[x] Grab	[x] Grab	[x] Grab	[x] Grab
[x] Composite	[x] Composite	[x] Composite	[x] Composite	[x] Composite

Phase II

Chrisfield	Edgewood
[x] Grab	[x] Grab
[x] Composite	[x] Composite

Type of Forecasted Precipitation

- [ ] Light Rain
- [x] Rain
- [ ] Scattered Showers
- [ ] Thunder Showers
- [ ] Snow Melt
- [x] Rain on Snow
- [ ] Other (Describe below)

Reasons for Not Targeting a Forecasted Storm or Targeting Selected Stations/Samples

- [ ] Equipment Concerns (Describe below)
- [ ] Holiday
- [ ] Other (Describe below)
- [x] Waiting on Antecedent Dry Period. Expires:

Comments

Past 72 hr precip: 0.04" Rain/Snow Mix. I talked with Dave at NWS. The early morning precip will be light and possibly snow. The heavier precip is predicted to start around 10am-noon and this will be rain. 0.25" during the day, then tapering off around 5pm-8pm. Models are in fairly good agreement and there is high confidence in this forecast. It is a W/NW system, so not much chance of rainshadowing.

NWS Forecast for: Boise ID
Issued by: National Weather Service Boise, ID
Last Update: 3:27 am MST Nov 12, 2020

Today: Increasing clouds, with a high near 43. Southeast wind around 8 mph.
Tonight: Mostly cloudy, with a low around 31. Southeast wind 5 to 7 mph.
Friday: Snow likely before 11am, then rain. High near 42. Southeast wind 5 to 10 mph increasing to 12 to 17 mph in the morning. Chance of precipitation is 100%. New snow accumulation of less than a half inch possible.
Friday Night: Rain likely, mainly before 11pm. Mostly cloudy, with a low around 34. Southeast wind around 14 mph becoming west northwest after midnight. Chance of precipitation is 70%. New precipitation amounts between a tenth and quarter of an inch possible.
Saturday: A chance of snow before 11am, then a slight chance of rain and snow. Partly sunny, with a high near 43. Light west southwest wind becoming west northwest 8 to 13 mph in the afternoon. Chance of precipitation is 30%. Little or no snow accumulation expected.
Saturday Night: A chance of rain and snow. Mostly cloudy, with a low around 35. Chance of precipitation is 50%. Little or no snow accumulation expected.
Sunday: A chance of rain and snow before 11am, then a chance of rain. Cloudy, with a high near 44. Chance of precipitation is 40%. Little or no snow accumulation expected.
Sunday Night: A 20 percent chance of rain. Mostly cloudy, with a low around 37.
Monday: Mostly cloudy, with a high near 51.
Monday Night: Mostly cloudy, with a low around 39.
Tuesday: Mostly cloudy, with a high near 53.
Tuesday Night: A 30 percent chance of rain. Mostly cloudy, with a low around 39.
Wednesday: A 30 percent chance of rain. Mostly cloudy, with a high near 52.
Area Forecast Discussion
National Weather Service Boise ID
309 AM MST Thu Nov 12 2020

.SHORT TERM...Today through Saturday night...An upper ridge moving in from the northwest will be accompanied by dry conditions today. Mostly clear skies and light winds this morning resulted in patchy fog in Baker, with patchy fog also possible this morning in other northern valleys - including McCall. Clouds will increase this afternoon ahead of a moist Pacific storm system. **The system is still expected to bring impressive precipitation totals to the mountains starting late tonight and continuing through Friday night. The heaviest period of precip is now expected from Friday afternoon through Friday evening, with central Idaho the main target area**. Snow levels will start off at valley floors Friday morning before rising to 4000-5000 feet Friday evening. **Snow accumulations of up to an inch are expected in the valleys Friday morning, including the Treasure Valley, before mixing with and changing to rain during the afternoon**. The Winter Storm Watch is still on track for the West Central Mountains and Boise Mountains where 1 to 2 feet are possible, mainly above 6000 feet, through early Saturday. It will also become windy on Friday, especially across southern portions of Harney/Malhuer Counties and Owyhee County Friday afternoon and evening. Breezy conditions may also create areas of blowing and drifting snow in mountains of central Idaho. Precipitation will diminish on Saturday while another disturbance arrives Saturday night for more (but light) precipitation. Temperatures will remain 5 to 10 degrees below normal.

.LONG TERM...Sunday through Thursday...No change in expected weather pattern through the extended period. As the moist system from earlier in the weekend continues eastward, all the models bring in warm air advection Sunday associated with a warm front from the next trough approaching the coast. Snow levels remain near the valley floors across the mountains regions, but 3500-5500 ft west of a line from Baker, Oregon to Twin Falls Idaho Sunday morning. Snow levels continue to rise Monday to 5500-7500 feet as an upper ridge amplifies over the Great Basin region. Only expecting lingering showers generally north of Baker and McCall Monday. Dry and warm conditions Tuesday as a southwest flow spreads over the region before the next trough pushes into the area Wednesday and Thursday. Snow levels expected to be around 5500-6500 feet across the forecast region. Depending on cloud cover, we could finally see temperatures warming to above normal by midweek.

Ada County Highway District

Attn: Monica Lowe
3775 Adams Street
Garden City, Idaho 83714–6418
Tel. (208) 387–6255
Fax (208) 387–6391

Purchase Order: ______________________
Project: ______________________
Sampler(s): ______________________
____
____

							Matrix	Type																	
Lab#	**Begin Date**	**End Date**	**Begin Time**	**End Time**	**Sample Identification**	**Sampler Initials**	Water	Grab	Composite	BOD_5 - SM 5210 B	COD - Hach 8000	TSS - SM 2540 D	TDS - SM 2540 C	TKN - Perstorp PAI-DK01	TP - EPA 200.7	Orthophosphate - EPA 365.1	Total As, Cd, Pb - EPA 200.7	Diss. Cd Cu, Pb, Zn - EPA 200.7	Total Hg - EPA 245.2	E. Coli - IDEXX Collilert	Turbidity - EPA 180.1	Hardness - SM2340 B	NO_3+NO_2 - EPA 353.2	NH_3 - SM 4500 NH_3 - D	Total Containers

Relinquished by (sign)	**Date & Time Transferred**	**Received by (sign)**	**Comments/Special Instructions:**

CLIENT CODE=

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION:		PROJECT INFORMATION:
Project Manager:		**Project Name:**
Company:		**PWS Number:**
Address:		**Purchase Order Number:**
		Required Due Date:
Phone:	**Fax:**	**E-mail Address:**
Sampled by: *(Please print)*	**Transported by:** *(Please print)*	

ANALYTICAL LABS, INC.

1804 N. 33rd Street • Boise, ID 83703
(208) 342-5515 • Fax: (208) 342-5591 • 1-800-574-5773
Website: www.analyticallaboratories.com
E-mail: ali@analyticallaboratories.com

TESTS REQUESTED

Lab ID	Date Sampled	Time Sampled	Sample Description (Source)	Sample Matrix										Remarks:

Invoice to: *(If different than above address)*	**Special Instructions:**

ALLOCATIONS OF RISK: Analytical Laboratories, Inc. will perform preparation and testing services, obtain findings and prepare reports in accordance with Good Laboratory Practices (GLP). If, for any reason, Analytical Laboratories, Inc. errors in the conduct of a test or procedure their liability shall be limited to the cost of the test or procedure completed in error. Under no circumstance will Analytical Laboratories, Inc. be liable for any other cost associated with obtaining a sample or use of data.

Note: Samples are discarded 21 days after results are reported. Hazardous samples will be returned to client or disposed of at client expense.

Relinquished By: *(Signature)*	**Print Name:**	**Company:**	**Date:**	**Time:**
Received By: *(Signature)*	**Print Name:**	**Company:**	**Date:**	**Time:**
Relinquished By: *(Signature)*	**Print Name:**	**Company:**	**Date:**	**Time:**
Received at Laboratory By: *(Signature)*	**Print Name:**	**Company:** Analytical Laboratories	**Date:**	**Time:**
SAMPLE RECEIPT **Total # of Containers:**	**Chains of Custody Seals Y / N / NA**	**Intact: Y / N / NA Temperature Received:**	**Condition:**	

REV. 2/19/10 WHITE: STAYS WITH SAMPLE(S) YELLOW: LAB PINK: SAMPLER

Outfall Investigation Form

Outfall ID

[ ]

Personnel

JA

Onsite Date/Time*

m/d/yyyy | hh:mm

Purpose of the Visit?*

- [ ] Outfall Inspection
- [ ] Previous Flow Investigation
- [ ] Geomean
- [ ] Other

Antecedent Dry Condition Met?

- ○ Yes
- ○ No

Pipe Type

Pipe Size

123

Structural Condition

- Good
- Fair
- Poor

Sedimentation

- None
- Yes

Staining

-Please Select-

S

Odor

-Please Select-

Vegetation

Vegetation surrounding pipe/restricting access/altering flow.

-Please Select-

Floatables (Not Trash)

-Please Select-

Trash Observed

- None
- Yes

Trash Rank

- [ ] Business
- [ ] Cigarette Butts
- [ ] Construction
- [ ] Household
- [ ] Yard Waste
- [ ] Choice 5

Trash Source

- [ ] Household
- [ ] Construction
- [ ] Commercial
- [ ] Industrial
- [ ] School
- [ ] Transient
- [ ] Unable to Determine

Flow Present*

- ○ None
- ○ Yes

Color

-Please Select- ▾

Clarity

-Please Select-

Samples Taken?*

- No
- Yes

Sample Collection Times

TSS Time

4.3 L Plastic Bottle

hh:mm

TP Time

500 mL Plastic Bottle

hh:mm

Detergents Time

1 L Plastic Bottle

hh:mm

E. Coli Time

250 mL Sterile Plastic

hh:mm

Ortho-P Time

1 L Sterile Plastic Bottle

hh:mm

Field Quantitative Results

Ortho-P Filtering Time

250 mL Plastic Bottle

hh:mm

Temperature - DO Meter (C)

Degrees C

123

Dissolved Oxygen (DO Concen)

mg/L

123

pH (S.U.)

S.U.

123

Conductivity (uS)

uS

123

Total Chlorine (mg/L)

mg/L

123

Phenols (mg/L)

mg/L

Total Copper (mg/L)

mg/L

Turbidity (NTU)

NTU

E. Coli (MPN)

MPN/100 mL

Total Suspended Solids (mg/L)

mg/L

Orthophosphate, as P (mg/L)

mg/L

Total Phosphorus (mg/L)

mg/L

Detergents (mg/L)

mg/L

Illicit Discharge?

- Unlikely
- Potential
- Obvious

Compliance Status?

- In Compliance
- Not in Compliance

Inspection Comments

255

Offsite Date/Time

m/d/yyyy

hh:mm

Photo

Select image file

Submit

Appendix C: Full QA/QC Sampling Schedule

Wet Weather QC Full Sampling Schedule

The QC schedule for E.coli (duplicate and field blank) is in the table below. This QC schedule covers the duration of the Phase II Permit, which expires Jan 31, 2026. Each targeted storm event was assigned a number and a random number generator equation was run for each year.

Permit Year[1]	Event 1	Event 2	Event 3
Feb 1, 2021 – Jan 31, 2022			Dup + Field Blank
Feb 1, 2022 – Jan 31, 2023		Dup + Field Blank	
Feb 1, 2023 – Jan 31, 2024			Dup + Field Blank
Feb 1, 2024 – Jan 31, 2025	Dup + Field Blank		
Feb 1, 2025 – Jan 31, 2026		Dup + Field Blank	

[1] The QC schedule will be implemented when wet weather monitoring begins.

Random number generation was completed using the random sequence generator available on the free site: https://www.random.org/. Information about the random number generator used can be found at https://www.random.org/randomness/.

In addition to the E.coli duplicate and field blank, the following QC samples will be collected on an annual basis:

Sample Type	Timing
Composite sample duplicate	Earliest opportunity (first event with sufficient sample volume)
Composite sample field blank	After three composite samples have been collected
Composite sample equipment blank	Fall maintenance
Composite sample rinsate blank	Fall maintenance

Appendix D: List of Receiving Waters

List of Receiving Waters and Outfall Count

Receiving Water	ACHD Owned	Non-ACHD Owned	Total
Ballentine Canal	3	1	4
Boise River	1	0	1
Boller Lateral	4	0	4
Bresheres Lateral	3	0	3
Creason Lateral	6	3	9
Cunningham Lateral	1	0	1
Downey Sublateral	4	0	4
Dry Creek	6	1	7
Dry Creek Canal	6	7	13
Dry Creek Lateral	9	0	9
Eagle Drain	21	14	35
Eightmile Creek	15	8	23
Eightmile Lateral	0	1	1
Evans Drain	2	11	13
Farmers Union Canal	2	0	2
Finch Lateral	3	0	3
Fivemile Creek	41	32	73
Fivemile Creek Lateral	2	0	2
Graham Gilbert Canal	4	0	4
Gruber Lateral	4	12	16
Hardin Drain	2	0	2
Hon Lateral	1	0	1
Jackson Drain	12	7	19
Jackson Drain Waste Ditch	1	0	1
Jackson Stub Drain	20	0	20
Kennedy Lateral	0	1	1
Lateral 10A	2	4	6
Lateral 16	8	1	9
Mason-Catlin Canal	7	0	7
Milk Lateral	1	0	1
New York Canal	8	1	9
Ninemile Creek	59	33	92
North Slough	1	0	1
Onweiler Lateral	1	0	1
Paris Lateral	1	0	1
Purdam Gulch Drain	1	0	1
Ridenbaugh Canal	2	15	17
Rutledge Lateral	4	2	6
Safford Sublateral	1	3	4
Settler's Canal	6	0	6
Sky Pilot Drain	2	0	2
Snider Lateral	2	0	2
South Slough	7	3	10
Spoils Bank Canal	3	0	3
Tenmile Creek	28	45	73
Tenmile Feeder Canal	13	0	13
Tenmile Sub Drain	4	12	16
Thurman Drain	1	0	1
Thurman Mill Canal	21	4	25
Thurman Mill Drain	0	1	1
Unnamed	37	0	37
Wood Lateral	2	0	2
Total 52	**395**	**222**	**617**

Appendix E: Dry Weather Outfall Screening Schedule

Outfall Screening Schedule 2021-2022

#	Outfall ID	Ownership	Receiving Water
1	2n1e02_001	ACHD	Cunningham Lateral
2	2n1e02_006	ACHD	Boller Lateral
3	3n1e06_004	ACHD	Fivemile Creek
4	3n1e06_007	ACHD	Jackson Drain
5	3n1e06_016	ACHD	Jackson Drain
6	3n1e06_023	ACHD	South Slough
7	3n1e06_025	ACHD	Jackson Stub Drain
8	3n1e06_027	ACHD	Jackson Stub Drain
9	3n1e06_036	ACHD	Finch Lateral
10	3n1e06_043	ACHD	Jackson Stub Drain
11	3n1e06_045	ACHD	Jackson Stub Drain
12	3n1e07_026	ACHD	Ninemile Creek
13	3n1e08_008	ACHD	Gruber Lateral
14	3n1e16_015	ACHD	Fivemile Creek
15	3n1e17_008	ACHD	Fivemile Creek
16	3n1e17_010	ACHD	Snider Lateral
17	3n1e18_003	ACHD	Tenmile Creek
18	3n1e18_005	ACHD	Fivemile Creek
19	3n1e19_017	ACHD	Tenmile Creek
20	3n1e19_028	ACHD	Ninemile Creek
21	3n1e20_017	ACHD	Ridenbaugh Canal
22	3n1e21_012	ACHD	Eightmile Creek
23	3n1e25_004	ACHD	Tenmile Feeder Canal
24	3n1e27_005	ACHD	Eightmile Creek
25	3n1e28_002	ACHD	Ninemile Creek
26	3n1e33_007	ACHD	Unnamed
27	3n1e34_002	ACHD	Ninemile Creek
28	3n1e35_003	ACHD	Wood Lateral
29	3n1e36_003	ACHD	New York Canal
30	3n1w01_026	ACHD	Fivemile Creek
31	3n1w01_027	ACHD	Settler's Canal
32	3n1w01_029	ACHD	Settler's Canal
33	3n1w01_035	ACHD	Unnamed
34	3n1w02_001	ACHD	Ninemile Creek
35	3n1w02_011	ACHD	Ninemile Creek
36	3n1w02_016	ACHD	Ninemile Creek
37	3n1w03_006	ACHD	Ninemile Creek
38	3n1w03_014	ACHD	Settler's Canal
39	3n1w03_017	ACHD	Rutledge Lateral
40	3n1w04_011	ACHD	Sky Pilot Drain
41	3n1w10_017	ACHD	Tenmile Creek
42	3n1w10_019	ACHD	Tenmile Creek
43	3n1w10_020	ACHD	Tenmile Sub Drain

Outfall Screening Schedule 2022-2023

#	Outfall ID	Ownership	Receiving Water
1	2n1e01_001	ACHD	New York Canal
2	2n1e02_003	ACHD	Boller Lateral
3	2n1e03_002	ACHD	Paris Lateral
4	3n1e05_004	ACHD	South Slough
5	3n1e05_007	ACHD	Milk Lateral
6	3n1e06_013	ACHD	Jackson Drain
7	3n1e06_015	ACHD	Jackson Drain
8	3n1e06_019	ACHD	Jackson Drain
9	3n1e06_024	ACHD	Settler's Canal
10	3n1e06_030	ACHD	Jackson Stub Drain
11	3n1e06_034	ACHD	Downey Sublateral
12	3n1e07_007	ACHD	Fivemile Creek
13	3n1e07_027	ACHD	Ninemile Creek
14	3n1e16_006	ACHD	Fivemile Creek
15	3n1e16_011	ACHD	Fivemile Creek
16	3n1e19_019	ACHD	Tenmile Creek
17	3n1e19_022	ACHD	Tenmile Creek
18	3n1e19_030	ACHD	Ninemile Creek
19	3n1e20_001	ACHD	Ninemile Creek
20	3n1e20_002	ACHD	Ninemile Creek
21	3n1e20_004	ACHD	Ninemile Creek
22	3n1e20_011	ACHD	Ninemile Creek
23	3n1e25_001	ACHD	Tenmile Feeder Canal
24	3n1e25_003	ACHD	Tenmile Feeder Canal
25	3n1e26_002	ACHD	Tenmile Feeder Canal
26	3n1e26_003	ACHD	Tenmile Feeder Canal
27	3n1e26_004	ACHD	Tenmile Feeder Canal
28	3n1e26_005	ACHD	Tenmile Feeder Canal
29	3n1e28_003	ACHD	Ninemile Creek
30	3n1e33_001	ACHD	Ninemile Creek
31	3n1e34_011	ACHD	Ninemile Creek
32	3n1e35_005	ACHD	Eightmile Creek
33	3n1w01_006	ACHD	Fivemile Creek
34	3n1w01_013	ACHD	Fivemile Creek
35	3n1w01_017	ACHD	Creason Lateral
36	3n1w01_021	ACHD	Creason Lateral
37	3n1w01_033	ACHD	Unnamed
38	3n1w02_005	ACHD	Ninemile Creek

Outfall Screening Schedule 2023-2024

#	Outfall ID	Ownership	Receiving Water
1	2n1e02_002	ACHD	Eightmile Creek
2	2n1e02_004	ACHD	Boller Lateral
3	2n1e04_003	ACHD	Unnamed

4	3n1e05_001	ACHD	South Slough
5	3n1e05_002	ACHD	South Slough
6	3n1e06_003	ACHD	Fivemile Creek
7	3n1e06_020	ACHD	South Slough
8	3n1e06_021	ACHD	South Slough
9	3n1e06_026	ACHD	Jackson Stub Drain
10	3n1e06_032	ACHD	Downey Sublateral
11	3n1e06_035	ACHD	Finch Lateral
12	3n1e06_037	ACHD	Finch Lateral
13	3n1e06_039	ACHD	Unnamed
14	3n1e06_041	ACHD	Jackson Stub Drain
15	3n1e06_042	ACHD	Jackson Stub Drain
16	3n1e06_046	ACHD	Jackson Stub Drain
17	3n1e06_047	ACHD	Jackson Stub Drain
18	3n1e07_005	ACHD	Fivemile Creek
19	3n1e08_017	ACHD	Jackson Drain
20	3n1e08_020	ACHD	Gruber Lateral
21	3n1e16_010	ACHD	Eightmile Creek
22	3n1e17_011	ACHD	Snider Lateral
23	3n1e25_002	ACHD	Tenmile Feeder Canal
24	3n1e25_007	ACHD	New York Canal
25	3n1e25_008	ACHD	New York Canal
26	3n1e26_006	ACHD	Tenmile Feeder Canal
27	3n1e27_001	ACHD	Eightmile Creek
28	3n1e27_002	ACHD	Eightmile Creek
29	3n1e27_003	ACHD	Eightmile Creek
30	3n1e27_007	ACHD	Eightmile Creek
31	3n1e27_008	ACHD	Tenmile Feeder Canal
32	3n1e27_009	ACHD	Unnamed
33	3n1e29_012	ACHD	Unnamed
34	3n1e34_004	ACHD	Ninemile Creek
35	3n1e34_006	ACHD	Ninemile Creek
36	3n1e34_007	ACHD	Ninemile Creek
37	3n1e35_002	ACHD	Eightmile Creek
38	3n1e35_004	ACHD	Wood Lateral
39	3n1e35_006	ACHD	Unnamed
40	3n1w01_015	ACHD	Fivemile Creek

Outfall Screening Schedule 2024-2025

#	Outfall ID	Ownership	Receiving Water
1	3n1e05_003	ACHD	South Slough
2	3n1e06_014	ACHD	Jackson Drain
3	3n1e06_028	ACHD	Jackson Stub Drain
4	3n1e06_029	ACHD	Jackson Stub Drain
5	3n1e06_031	ACHD	Jackson Stub Drain
6	3n1e06_038	ACHD	Onweiler Lateral

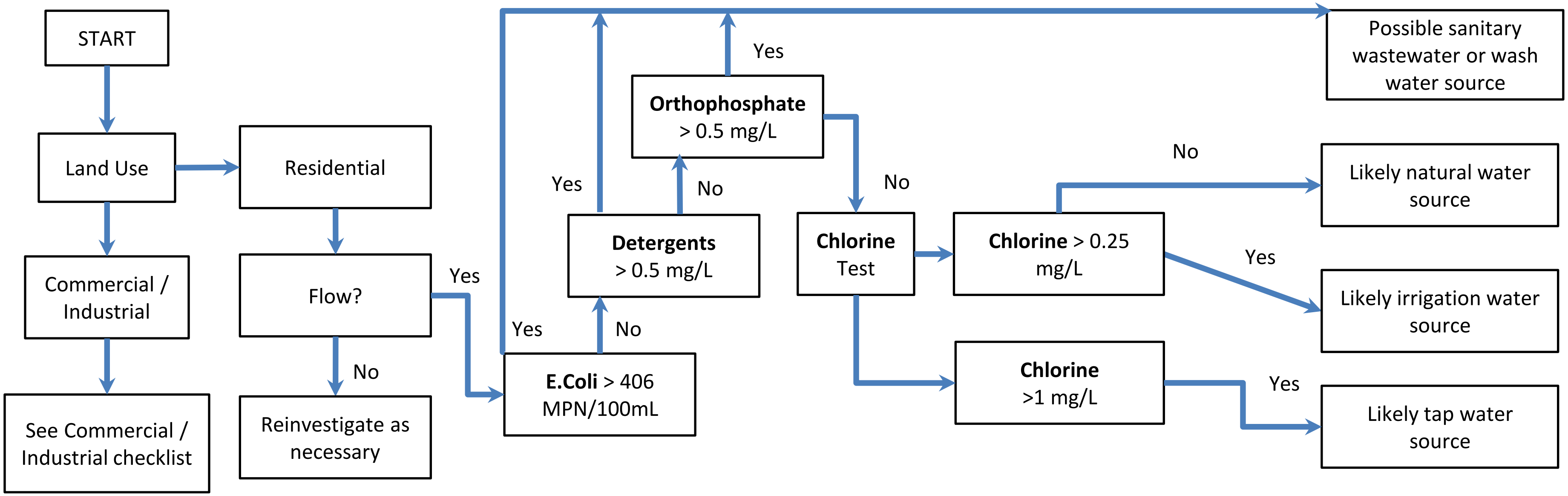
7	3n1e06_040	ACHD	Downey Sublateral
8	3n1e06_044	ACHD	Jackson Stub Drain
9	3n1e06_049	ACHD	Jackson Stub Drain
10	3n1e07_009	ACHD	Jackson Drain
11	3n1e08_003	ACHD	Gruber Lateral
12	3n1e08_019	ACHD	Evans Drain
13	3n1e09_011	ACHD	Evans Drain
14	3n1e16_014	ACHD	Fivemile Creek
15	3n1e17_004	ACHD	Fivemile Creek
16	3n1e17_006	ACHD	Fivemile Creek
17	3n1e17_009	ACHD	Fivemile Creek
18	3n1e18_018	ACHD	Ninemile Creek
19	3n1e19_002	ACHD	Tenmile Creek
20	3n1e19_003	ACHD	Tenmile Creek
21	3n1e19_004	ACHD	Tenmile Creek
22	3n1e19_011	ACHD	Tenmile Creek
23	3n1e20_005	ACHD	Ninemile Creek
24	3n1e20_007	ACHD	Ninemile Creek
25	3n1e25_005	ACHD	Tenmile Feeder Canal
26	3n1e25_006	ACHD	Tenmile Feeder Canal
27	3n1e25_009	ACHD	Fivemile Creek
28	3n1e26_001	ACHD	Tenmile Feeder Canal
29	3n1e27_004	ACHD	Eightmile Creek
30	3n1e27_006	ACHD	Eightmile Creek
31	3n1e29_011	ACHD	Tenmile Creek
32	3n1e34_008	ACHD	Ninemile Creek
33	3n1e34_010	ACHD	Ninemile Creek
34	3n1e36_002	ACHD	New York Canal
35	3n1w01_004	ACHD	Fivemile Creek
36	3n1w01_020	ACHD	Creason Lateral
37	3n1w01_036	ACHD	Unnamed
38	3n1w02_003	ACHD	Ninemile Creek
39	3n1w02_013	ACHD	Ninemile Creek
40	3n1w10_016	ACHD	Tenmile Creek

Outfall Screening Schedule 2025-2026

#	Outfall ID	Ownership	Receiving Water
1	2n1e02_005	ACHD	Boller Lateral
2	2n1e03_003	ACHD	Unnamed
3	2n1e11_001	ACHD	Hon Lateral
4	3n1e05_008	ACHD	Jackson Stub Drain
5	3n1e05_009	ACHD	Jackson Stub Drain
6	3n1e06_017	ACHD	Jackson Drain
7	3n1e06_018	ACHD	Jackson Drain
8	3n1e06_033	ACHD	Downey Sublateral
9	3n1e06_048	ACHD	Jackson Stub Drain

10	3n1e06_050	ACHD	Jackson Stub Drain
11	3n1e06_051	ACHD	Jackson Stub Drain
12	3n1e07_004	ACHD	Fivemile Creek
13	3n1e08_015	ACHD	Jackson Drain
14	3n1e08_021	ACHD	Jackson Drain Waste Ditch
15	3n1e16_002	ACHD	Fivemile Creek
16	3n1e17_005	ACHD	Fivemile Creek
17	3n1e19_018	ACHD	Tenmile Creek
18	3n1e20_020	ACHD	Unnamed
19	3n1e34_005	ACHD	Ninemile Creek
20	3n1e34_009	ACHD	Ninemile Creek
21	3n1e35_001	ACHD	Eightmile Creek
22	3n1e36_001	ACHD	New York Canal
23	3n1e36_004	ACHD	New York Canal
24	3n1e36_005	ACHD	New York Canal
25	3n1w01_012	ACHD	Fivemile Creek
26	3n1w01_018	ACHD	Creason Lateral
27	3n1w01_019	ACHD	Creason Lateral
28	3n1w01_025	ACHD	Creason Lateral
29	3n1w01_031	ACHD	Unnamed
30	3n1w01_034	ACHD	Unnamed
31	3n1w02_002	ACHD	Ninemile Creek
32	3n1w03_002	ACHD	Ninemile Creek
33	3n1w03_013	ACHD	Rutledge Lateral
34	3n1w03_016	ACHD	Rutledge Lateral
35	3n1w09_009	ACHD	Purdam Gulch Drain
36	3n1w10_014	ACHD	Tenmile Creek
37	3n1w11_007	ACHD	Ninemile Creek
38	3n1w11_017	ACHD	Ninemile Creek

Appendix F: Source Tracing Flow Chart



Action Level Flow Chart: Residential

Action Level Flow Chart: Commercial / Industrial