



City of Nampa Stormwater Division

Quality Assurance Plan for Stormwater Monitoring

October 15, 2010





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Prepared By Cheryl Jenkins, Stormwater Program Manager

October 15, 2010

Original Quality Assurance Plan Approval:

Signature: _____

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Revision Approvals:

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Stormwater Acronyms

BMP:	Best Management Practice
CFR:	Code of Federal Regulations
CGP:	Construction General Permit
CWA:	Clean Water Act
DMR:	Discharge Monitoring Report
DQO:	Data Quality Objectives
ESC:	Erosion and Sediment Control
EPA:	Environmental Protection Agency
ESA:	Endangered Species Act
IDEQ:	Idaho Department of Environmental Quality
ITD:	Idaho Transportation Department
LBR:	Lower Boise River
MDL:	Method Detection Limit
MEP:	Maximum Extent Practicable
MS4:	Municipal Separate Storm Sewer System
NPDES:	National Pollution Discharge Elimination System
NWWTP:	Nampa Wastewater Treatment Plant
SHPO:	State Historical Preservation Office
SM:	Standard Methods
SOP:	Standard Operating Procedure
SWAG:	Stormwater Advisory Group
SWMP:	Storm Water Management Plan
SWPPP:	Storm Water Pollution Prevention Plan
TMDL:	Total Maximum Daily Load
QA/QC:	Quality Assurance/Quality Control
QAP:	Quality Assurance Plan

INTRODUCTION

This document represents a modification of the Nampa Wastewater Treatment Plant (NWWTP) Quality Assurance Plan (QAP) in order to meet the Municipal Separate Storm Sewer System (MS4) stormwater monitoring requirements as set forth in the City of Nampa's National Pollutant Discharge Elimination System (NPDES) permit number IDS-028126. The original QAP was created in April of 2005 to meet monitoring requirements of the City of Nampa's Wastewater NPDES permit number ID-002206-3.

Nampa's Stormwater Division intends to utilize this QAP with minor modifications and additions. The Stormwater QAP is designed to assist in the planning and implementation of stormwater discharge sample collection and the NWWTP QAP will cover the sample analysis of collected samples.

Nampa's Stormwater Division recognizes the importance of a quality assurance/quality control (QA/QC) program for proper collection and analysis of stormwater discharge samples and accurate generation of data. It is the intention of the Stormwater Division to strictly adhere to accepted QA/QC protocol in all aspects of Nampa's stormwater monitoring efforts. As a requirement of the MS4 permit a Monitoring Plan was developed concurrently with this QAP. Portions of this QAP may reference sections in the Monitoring Plan.

Project Management: Project/Task Organization

Purpose/Background

The Environmental Protection Agency (EPA) issued the City of Nampa an NPDES MS4 permit effective October 15, 2009. This Stormwater QAP was developed to meet MS4 permit requirements as outlined in Section IV of the MS4 permit. Section IV.A.6 allows any existing QAP to be modified to meet permit requirements.

Roles and Responsibilities

Nampa Stormwater Staff:

Roles and responsibilities of the Stormwater staff will include sample site selection, determination of sample collection time, collection of sample, sample preservation, field chain of custody procedures, field QA/QC sample analysis, transport of samples to laboratory, review collection of analytical results and data management.

The *Stormwater Program Manager* has the authority to make changes to the Stormwater QAP and corresponding Monitoring Plan. Data from the required analysis will be utilized by the Stormwater staff to prepare reports submitted to the EPA and the Idaho Department of Environmental Quality (IDEQ).

Nampa Wastewater Treatment Plant Laboratory Staff:

Roles and responsibilities of the NWWTP staff will include laboratory chain of custody procedures, analysis of sample; perform routine QA/QC sample analysis, check calculations and transfer resulting analytical data to Stormwater.

NWWTP Environmental Manager/Assistant Superintendent has the authority to make changes to the NWWTP QAP and corresponding Monitoring Plan. Data from the required Stormwater analysis can be utilized by NWWTP staff as needed.

Stormwater Division Personnel and Qualifications

The Stormwater Division operates under the Department of Public Works. Creation of the Stormwater Division in October 2009 encompassed the following City of Nampa personnel to carry out the objectives and goals of Nampa's Stormwater Program.

- ❖ *Cheryl Jenkins*, Stormwater Program Manager
 - Stormwater Division Superintendent
 - BS Biology, Certified WW Laboratory II, WW Operator I, Responsible Person Erosion and Sediment Control Certification
 - 15 years Wastewater Laboratory and 4 years Stormwater experience
 - Direct supervision of Stormwater Division personnel.

- ❖ *Ray Rice*, Stormwater Inspector
 - Water Distribution I certification
 - Responsible Person Erosion and Sediment Control Certification
 - 10 years Water, 10 years Engineering Inspector and 2 years Stormwater experience
 - Performs field inspections relating to stormwater issues.

- ❖ *Jim Critz*, Erosion Control Coordinator
 - 4+ years Civil Engineering curriculum
 - Responsible Person and Plan Designer Erosion and Sediment Control certifications
 - 3.5 years Erosion and Sediment Control/Stormwater experience
 - Coordinates the Erosion and Sediment Control Program and assists in Stormwater activities.

City staff sought the technical assistance and support of several contracted consultants to aid in the development of this Stormwater QAP and associated Monitoring Plan. Continued support from these consultants remains a valuable tool to evaluate and update these documents.

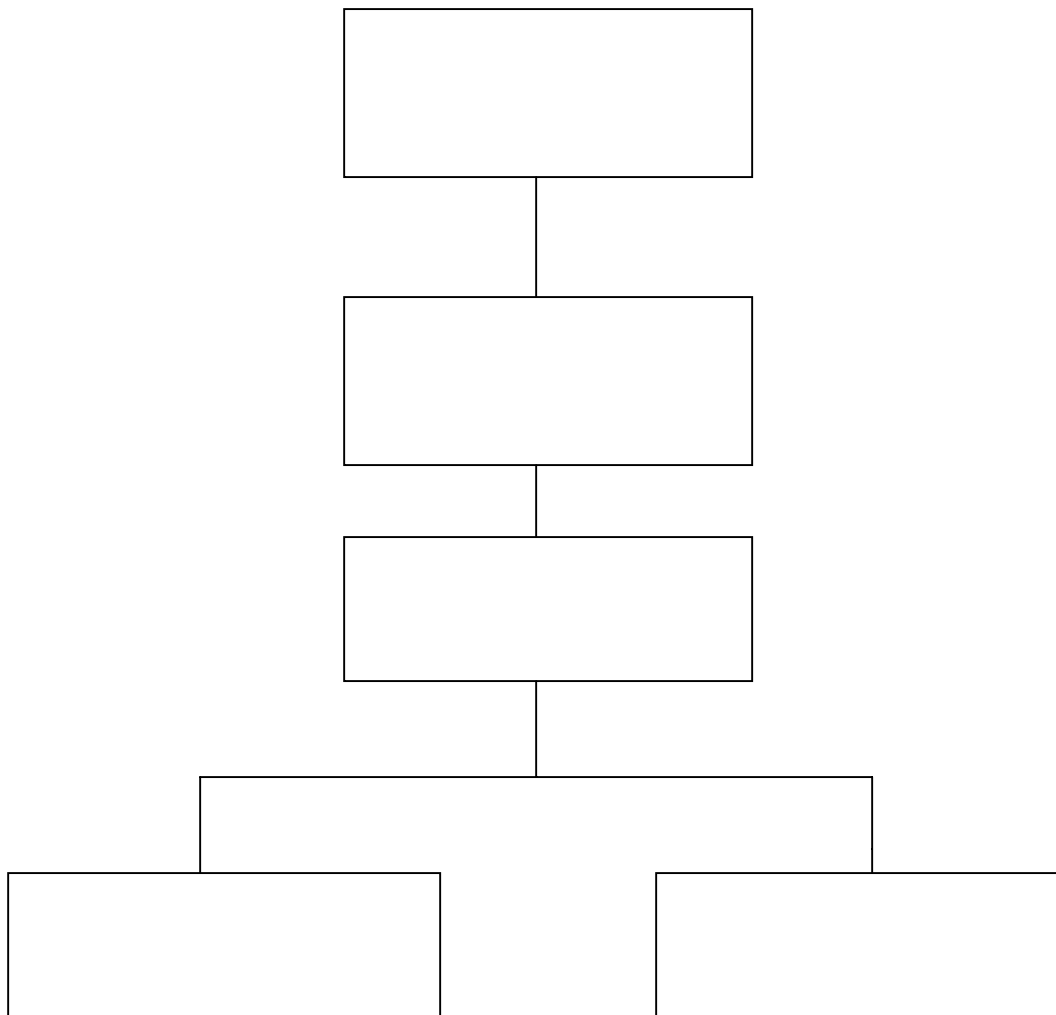
The Stormwater Division may seek the assistance of additional Public Works employees and or contract temporary personnel to aid in the implementation of the Monitoring Plan which could include duties described in this Stormwater QAP. Any additional personnel will be trained in the proper methods described in the approved documents and kept under close supervision. A training log will be kept for all Stormwater Division personnel or temporary

personnel performing duties on behalf of the Stormwater Division. Training documentation will be logged in a bound notebook and will be available for reference in the Stormwater Division Office.

The following flowcharts show the current organizational position of the Stormwater and Wastewater Divisions in relation to the City governing structure. Thorough planning and coordination between the two divisions of Public Works will help ensure confidence in a program designed to generate accurate and useable data.

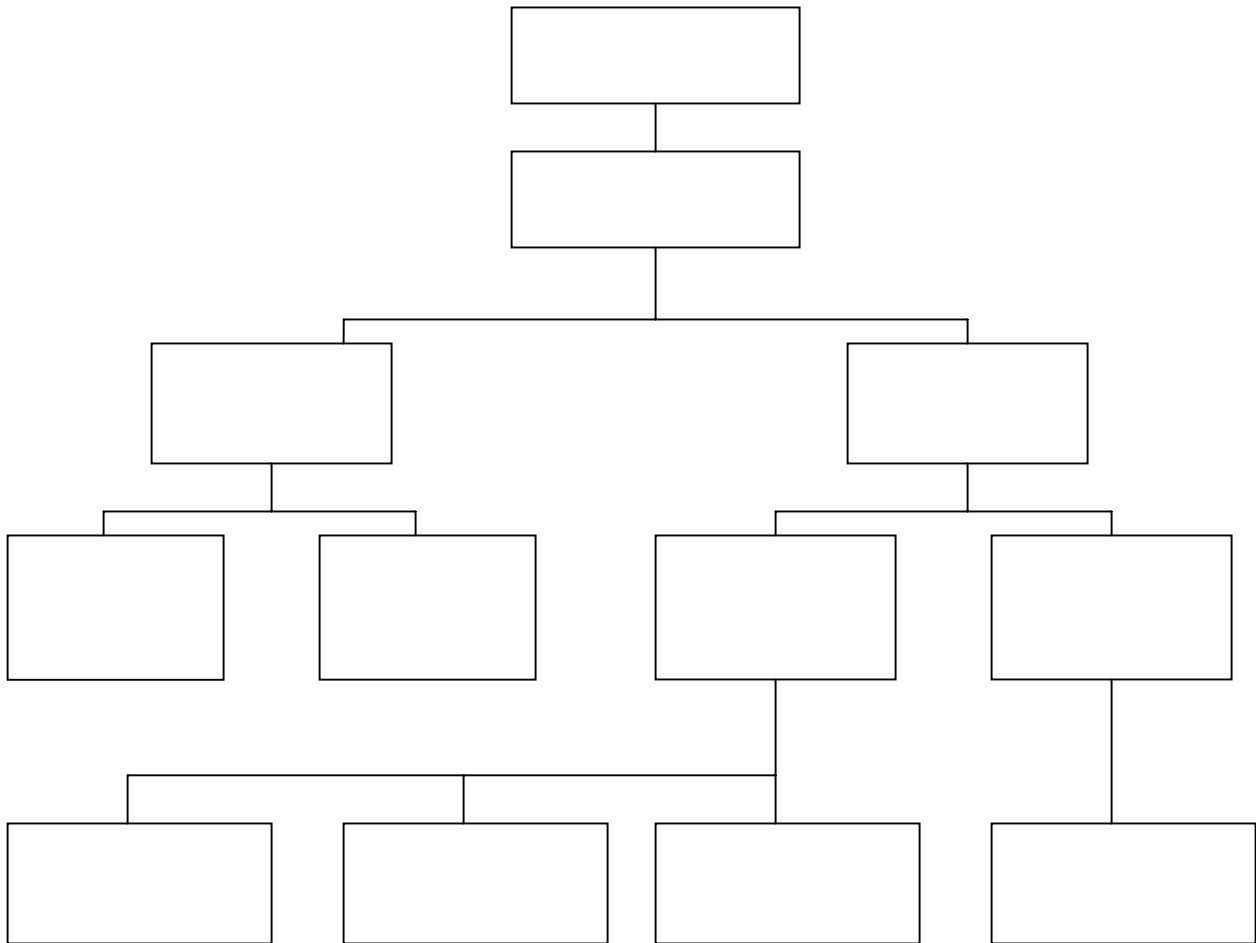


*Stormwater Division
Organization Chart
FY 2010 – 2011*





*Stormwater/Wastewater Organizational Chart
FY 2010-2011*



This organizational flowchart depicts the chain of command for facilitation of stormwater monitoring efforts in the Wastewater and Stormwater Divisions.

Contracted Services

The Stormwater Division will seek to contract commercial laboratories for test procedures that cannot be performed at the NWWTP laboratory due to lack of equipment, accepted analytical procedure or sufficient personnel or time to perform required analyses. Available upon request are copies of all QA/QC procedures of all tests performed by commercial laboratories for the purpose of meeting the requirements set forth by the NPDES MS4 Permit. If required, the Stormwater Division plans on utilizing the current commercial laboratory contracted by NWWTP. This contracted commercial laboratory is as follows:

Analytical Laboratories
1804 North 33rd
Boise, ID 83703
Phone (208) 342-5515

The Stormwater Division will purchase required supplies associated with stormwater monitoring efforts from reputable companies that routinely supply environmental monitoring equipment. Acquisition of monitoring equipment and certified QA/QC supplies may include but not limited to the following:

Fisher Scientific
2000 Park Lane Drive
Pittsburgh, PA 15275
Phone (800) 766-7000

Hach Company
P.O. Box 389
Loveland, CO 80539
Phone (800) 227-4224

North Central Laboratories
P.O. Box 8
Birnamwood, WI 54414
Phone (800) 648-7836

Stormwater Monitoring Equipment

Equipment essential to sample collection and transport to NWWTP or contract laboratory will be supplied by the Stormwater Division. Laboratory equipment relevant to sample analysis will be supplied by the NWWTP or contract laboratory. The following equipment list will include but not limited to:

Stormwater Division

- Sampling Equipment: Flow meters, automatic samplers, sample bottle holders or any other necessary equipment for sample collection

- Sample Containers: Plastic, glass or other appropriate containers as required in 40 CFR Part 136
- Sample Preservation Equipment: Coolers, ice packs, preservation chemicals
- Chain of Custody Items: Custody seals, chain of custody forms
- Vehicles to transport samples to laboratory

Wastewater Division

- Analysis Equipment: Necessary equipment for sample analysis and associated support systems

Routine maintenance, calibrations, and general upkeep of the sampling equipment will be performed by the respective parties responsible for supplying the field and laboratory equipment. Maintenance records will be kept in regards to sampling equipment upkeep. These maintenance records will be stored by the responsible party performing the maintenance procedures. The Storm water Division will make these records available for reference in the Stormwater Office and NWWTP records will be available in the laboratory.

Supplies and Consumables

The Stormwater Division will order all supplies and consumables associated with the required stormwater monitoring efforts. Supplies will be ordered in advance to avoid running out of critically needed items. When supplies arrive, the person receiving the order will inspect the received items and record the date of arrival and their initials. Acceptance criteria for supplies include the following requirements:

- Supplies must arrive undamaged and in good condition
- Items are appropriate for the project task
- Expiration dates must be suitable for supply use
- Date received and date opened must be marked on the item
- Supplies must be stored in the proper manner and as suggested by the manufacturer
- A certificate must accompany the instrument or standard which can be traceable to an approved source

A list of potential sources for acquisition of supplies and consumables is provided in the *Contracted Services* section of this QAP.

Distribution List

The following is a list of people who have a copy of the approved QAP and any revisions to the plan.

- Andy Tiller: Environmental Manager (Laboratory and Pretreatment Supervisor) at the City of Nampa Wastewater Treatment Plant 340 W. Railroad Street

- Cheryl Jenkins: Stormwater Program Manager (Stormwater Division Superintendent) at the Stormwater Office in City Hall 411 Third Street South
- Nampa Wastewater Treatment Plant Laboratory: A copy of the approved QAP will be available for review in the NWWTP Laboratory 340 W. Railroad Street
- Environmental Protection Agency: Seattle, WA
- Idaho Department of Environmental Quality: Boise, ID

The Stormwater Division will conduct an annual review and update of the Stormwater QAP in conjunction with the Stormwater Management Plan (SWMP) annual review as set forth in Part II.D of Nampa's MS4 permit. Stormwater will coordinate any changes made to the Stormwater QAP with the NWWTP Environmental Manager and incorporate any changes into the approved NWWTP QAP document. Reviews and updates to the NWWTP QAP will be conducted as scheduled by the Environmental Manager who will then coordinate with the Stormwater Program Manager to receive updates to the Stormwater QAP.

Data Handling and Management

City Ethics Policy on Waste, Fraud, and Abuse

The City of Nampa has a no tolerance policy with regard to falsification or improper manipulation of data. The City will assume that any and all data generated by Stormwater staff has been done so within the framework of this approved QA/QC plan. If it is found that a person is falsifying or manipulating data, the City reserves the right to terminate that person immediately. All current policies on waste, fraud and abuse documented in the NWWTP QAP will be recognized and enforced in all stormwater monitoring activities.

The City of Nampa recognizes the importance of the validity of the data its Stormwater staff generates. Any deviations from the established protocols set forth in the QAP will be investigated and any data determined to be invalid will be discarded. Sufficient training on the approved sample collection methods will be provided and documentation of this training will be provided upon request.

Corrective Action

Stormwater monitoring activities are governed by documented procedures, requirements, and quality assurance plans. When any activity, for any reason, does not conform to the requirements of the governing documents, the non-conforming event or situation must be properly documented, evaluated, and appropriate corrective action must be taken. It is the responsibility of the person discovering the non-conforming situation to initiate corrective action. Consultation with a supervisor and appropriate documentation is to be made citing the problem and corrective action taken.

Data Quality Objectives and Criteria for Measurement Data

Data Quality Objectives (DQO) incorporated in the NWWTP QAP include accuracy, precision, representation, completeness, comparability, and measurement range. Stormwater monitoring efforts will also include the DQO applicable to sample collection, preservation and sample transport to the laboratory for analysis.

Accuracy

At the NWWTP accuracy is measured through the analysis of known standards, spiked samples, and evaluation of unknown samples. Samples collected in conjunction with the stormwater monitoring efforts will be incorporated into the currently established QA/QC program already being utilized by NWWTP Laboratory staff. These accuracy techniques are evaluated with internally prepared or externally acquired standards. Results of these QA/QC analyses will be included with the stormwater monitoring data.

Precision

Within the laboratory, precision is measured through the duplicate analysis of the same sample. Parameters measured are the one required by Nampa's MS4 permit. Duplicate testing of stormwater discharge monitoring samples provides data to ensure accurate data for permit compliance and monitoring procedures. Results of these QA/QC analyses will be included with the stormwater monitoring data.

Representation

Representativeness is a measure of the degree to which data accurately represents the characteristics of an environmental condition. Samples will be collected through a manual grab or an automatic sampler. Stormwater staff will strive to collect a sample which reflects the true conditions of the outfall discharge during a storm event. Sample collection during a storm event will occur within the first 120 minutes to capture first flush characteristics.

Completeness

Completeness is the measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions. Nampa's MS4 permit requires that Indian Creek, Mason Creek and Wilson Drain be monitored four (4) times per year during specified time periods for the five (5) parameters listed in Table IV.A of the permit. As stated in the permit if samples cannot be collected due to lack of rainfall in these periods, samples may be collected in other months as necessary to meet the minimum of four (4) samples. If data is determined to be invalid a new sampling event will be scheduled to meet permit monitoring requirements.

Comparability

Comparability is the measure of the confidence with which one data set can be compared to another over time. Consistency in site locations, parameters measured, sample collection methods, analytical methods and units of measure all contribute to an acceptable

comparability rate. As Nampa's stormwater monitoring efforts become established and continue in a constant methodology the comparability value of the collected data is expected to be high.

Measurement Range

The laboratory at the NWWTP will perform many of the analysis required for permit compliance with monitoring requirements. Analyses that cannot be performed at the NWWTP laboratory will be subcontracted out to commercial laboratories. In either situation, the range for each measured parameter is established. If a value falls outside the measurement range, the result is reported as greater than (>) or less than (<) the upper or lower measurement range, respectively.

Data Acquisition Requirements

A majority of the data used in project implementation, decision making and required reports will be generated and compiled internally through cooperative efforts between the Stormwater Division, NWWTP and potentially additional departments and divisions within the City of Nampa. Contracted laboratories would provide analysis on stormwater discharge samples on an as needed basis. Stormwater staff may incorporate the services of contracted consultants to provide technical support in various projects, reports and decision making opportunities.

Recordkeeping

The Stormwater Division will retain records and copies of all information for a period of at least five (5) years from the date of sample collection, analytical measurement and report generation. Monitoring information retained will include but not be limited to: calibration and maintenance records, all original strip chart recordings for any continuous monitoring instrumentation, chain of custody forms, laboratory bench sheets, and any information associated with the collection and generation of data. This information will be retained at an accessible location and made available to the public if requested to do so in writing. If requested or required, information pertaining to Nampa's Stormwater Monitoring Program will be provided to EPA and IDEQ.

Reports to Management

The following is a list of reports that are produced using data generated from the stormwater monitoring efforts within the City of Nampa:

- Stormwater Discharge Monitoring Report: Within three (3) years (January 15, 2012) from the effective date of the MS4 permit and once per year thereafter, all available stormwater discharge monitoring data will be submitted as part of the Annual Report.

- **Annual Report:** No later than January 15 of each year beginning in 2011 an Annual Report will be submitted to EPA and IDEQ. This report will include results of any information collected and analyzed during the previous twelve (12) month period, including stormwater discharge analytical results of samples collected, estimates of cumulative daily and monthly average pollutant loads for each pollutant at each sample location.

These reports will be posted on the City of Nampa’s Stormwater Division website and made available to the public upon request.

Monitoring Requirements

The Stormwater Division must meet the monitoring requirements established in Table IV.A of the MS4 permit. These monitoring requirements are summarized in the table below.

Table 1: City of Nampa Monitoring Requirements

City of Nampa NPDES MS4 Permit Table IV.A			
Parameter	Monitoring Requirements		
	Sample Location ¹	Sample Frequency ²	Sample Type ³
Flow (cfs)	See Below	4 times/year	Grab
Total Suspended Solids (mg/L)	See Below	4 times/year	Grab
Total Phosphorus (mg/L)	See Below	4 times/year	Grab
Total Nitrogen	See Below	4 times/year	Grab
E.coli	See Below	4 times/year	Grab

¹Outfall location to be determined by the City.

²A minimum of four samples must be collected in a calendar year. Monitoring should occur within the following periods: March – April, May – June, July- August, September – October. If samples cannot be collected due to lack of rainfall in these periods, samples may be collected in other months as necessary to meet the minimum of four samples. Sampling should occur within the first 120 minutes of a storm event.

³Grab samples may be taken manually or with an automatic water sampler.

Location of Outfall Monitoring Activities

To meet the monitoring requirements outlined in Section IV.A of the MS4 permit, the Stormwater Division must sample at least one outfall discharging into each of the following water bodies within City limits: Indian Creek, Mason Creek and the Wilson Drain. The three monitoring sites were selected to represent the following land use types: residential, commercial, and mixed land use. A detailed description of each monitoring site can be found in the *City of Nampa NPDES Monitoring Plan* found in Appendix B of this QAP. Maps depicting monitoring locations can found in Appendix C of the *Monitoring Plan*. Stormwater monitoring sites were selected to help estimate the pollutant loading of the

pollutants of concern (sediment, bacteria, and nutrients) discharging to Indian Creek, Mason Creek, and Wilson Drain.

Sampling Methods Requirements

Sample Handling

Information on the collection and handling of samples will be completely documented to allow the details of sample collection and handling to be re-created. All information will be entered in ink at the time the information is generated in a permanently bound logbook. Errors will not be erased or crossed out but corrected by putting a single line through the error and by entering, initialing, and dating the correct information. Each set of information will have an identifying printed name, signature, and date. Sample handling documentation will include the following documents:

- Field Logs: Documentation of events occurring during field sampling to identify individual field samples.
- Sample Labels: Links individual samples with the field log and the chain-of-custody record.
- Chain-of-Custody Records: Documentation of exchange and transportation of samples from the field to final analysis.
- Sample Receipt Log: Documentation of receipt of the laboratory or organization of the entire set of individual samples for analysis.

Documentation related to sample handling during sample preparation and analysis will be completed by the NWWTP laboratory personnel or the laboratory contracted to conduct the required analysis. Proper chain-of-custody and sample handling procedures will be practiced for all samples collected and transported to the laboratory performing analysis. All personnel handling samples will be responsible for maintaining sample integrity. All steps in the chain-of-custody process are well documented and records are maintained for future reference. Examples of the sample handling documents are provided in appendix D.

Stormwater Monitoring Master Test List

The following tests will be performed as per requirements set forth in Nampa’s MS4 permit:

Table 2: Master Test List

Test	Responsible Party	Method	MDL
Flow (cfs)	Stormwater Staff	Portable Flow Meter Staff Gauge	NA
Total Suspended Solids (mg/L)	NWWTP	SM 2540 D	2.5 mg/L
Total Phosphorus (mg/L)	NWWTP	Hach 3036 SM 4500-P EPA 365.4	0.05 mg/L

Total Nitrogen	Contract Lab	EPA 351.2	0.1 mg/L
E. coli	NWWTP	SM 9223 B-Colilert	1 colony/100 ml

Stormwater Sample Preservation Techniques

Table 3 lists the sampling protocol to be followed during collection of the stormwater discharge for analysis. Any deviation in the sampling protocol will be reported immediately and corrective action will be taken. A replacement sample will be taken if possible and no samples will be analyzed if they are determined to be invalid.

Table 3 Stormwater Sample Preservation Techniques

Test	Min. Sample Volume	Sample Container	Preservation Requirement	Maximum Holding Times Recommend/Regulated
Total Suspended Solids	200	Plastic or Glass	Refrigerated 4° C	7 Days
Total Phosphorus	100	Plastic or Glass	H ₂ SO ₄ ; pH <2 Refrigerate 4° C	28 Days
Total Nitrogen	500	Plastic or Glass	H ₂ SO ₄ ; pH <2 Refrigerate 4° C	7 Days/28 Days
E. coli	100	Plastic	Refrigerate 4° C Sodium Thiosulfate	24 Hours

Appendix A: Standard Operating Procedures for Stormwater Sampling

SOP A-1: Grab Sampling Procedures

SOP A-2: Chain of Custody Records

SOP A-3: Transporting Samples from Field to Lab

SOP A-1: Grab Sampling Procedures

Set up a safety zone, if appropriate (this may include the placement of traffic cones, etc.).

Then provide access to the sample collection point. Make notes in a field notebook regarding site conditions and sampling.

Grab Sampling

The grab sampling technique is described as follows:

- Place the sample bottle in the middle of the flow stream. If the sample collection location is deep, a long-handled sample collection pole or rope with bailer will be needed. One can also “zip tie” the bottle onto the pole and collect the sample in the bottle. *E. coli* samples must be collected directly into the bottle.
- Once the bottle is filled to the proper level, replace the lid on the sample bottle; fill out the bottle label (or write directly on the bottle with a sharpie pen) to identify sample location, date, and time; and place it in the cooler with ice.
- Write the sample collection time and other relevant information in the field notebook.

SOP A-2: Chain of Custody Records

A chain-of-custody record (COC) is a legal document designed to track samples and persons who are responsible for them during preparation of the sample container, sample collection, sample delivery, and sample analysis. These forms are supplied by the stormwater coordinator.

The procedures for filling out these forms are as follows:

Before Sampling

A bottle inventory check should be conducted before leaving for the field. Table 3 contains a sample bottle inventory checklist.

After bottles are inventoried, they should be labeled and placed in iced coolers, the following general information should be included on the COC form:

- Source/location
- Persons sampling
- Type of sample (composite or grab)
- Parameters desired for analysis

Place the COC in a Ziploc bag in the cooler or in another secure location.

After Sampling is Complete

After sampling has been completed, fill out remainder of the COC including:

- Time and date that sampling was conducted

At Laboratory or Upon Transfer to Another Person

Whenever custody of the samples are relinquished:

- Provide signature, date, time, and job title
- Relay special instructions, if any

SOP A-3: Transporting Samples from Field to Lab

- Keep the chain of custody record form with the samples.
- Pack samples well within ice chest to prevent breakage or leakage.
- As was stated previously, samples should be packed in ice or an ice substitute to maintain a sample temperature of four degrees Celsius during transport. Acquire more ice at a convenience store, if necessary.
- Samples must be delivered to the water quality laboratory within six hours of bacteria sample collection.
- Samples will be preserved by laboratory personnel upon arrival.

Appendix B: City of Nampa NPDES MS4 Monitoring Plan

See Appendix E of the Annual Report

Appendix E: Analytical Laboratories QA/QC Manual

Copy of Document Available Upon Request

