Quality Assurance Project Plan

NPDES Wastewater Monitoring for:

Smallville STP

February 2020

Version 1.0

This Quality Assurance Project Plan was prepared by:

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Approval Sheet

Prepared By: _____ Date _____

Data McDaterton, Facility
Responsible Official

Approved By _____ Date _____

Data McDaterton, Facility
Quality Assurance Officerr

Approved By: _____ Date: _____

Tom Tonkaman, Public Works
Director

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1. Project Management

1.1. Distribution List

This QAPP must be kept on file by the Smallville STP and must be provided to Oregon DEQ upon request. Those on this distribution list should be notified of all deviations from the procedures of this QAPP, including potential modifications.

Table 1. Distribution List

Name	Phone	Email
Data McDaterton	XXX-XXX-XXXX*	DMcD@smallville.com
Tom Tonkaman,	XXX-XXX-XXXX	TTon@smallville.com*

* = Preferred contact method

1.2. Acronyms

CCV Continuing Calibration Verification
CFR Code of Federal Regulations
COC Chain of Custody
DEQ Oregon Department of Environmental Quality (Oregon DEQ)
DQO Data Quality Objective
EPA Environmental Protection Agency
HUC Hydrologic Unit Code
ICV Initial Calibration Verification
LCS Laboratory Control Sample
LIMS Laboratory Information Management System
LOQ Limit of Quantitation
LPM Laboratory Project Manager
MB Method Blank
MS Matrix Spike
NPDES National Pollutant Discharge Elimination System
PM Project Manager
QA Quality Assurance
QAO Quality Assurance Officer
QC Quality Control
QAPP Quality Assurance Project Plan
QC Quality Control
QMP Quality Management Plan
SOP Standard Operating Procedure

1.3. References

U.S. Environmental Protection Agency, 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process.* (EPA QA/G-4). EPA/240/B-06/001.

US. Environmental Protection Agency, 2007. *Solution to Analytical Chemistry Problems with Clean Water Act Methods*. EPA 821-R-07-002

Oregon Department of Environmental Quality, 2012. *Use of Significant Figures and Rounding Conventions in Water Quality Permitting.* DEQ11-WQ-050 Rev 1.3.

1.4. Definitions

Sampling Event: A group of samples collected and/or shipped under a single Chain of Custody (COC); by an individual or individual sampling team (usually a single day's sampling activity).

Reference Material: A material or substance that is sufficiently homogenous, stable, and well established to be used for calibration of an instrument or assessment of a method.

Metadata: A set of data that describes and gives information about other data (e.g. collection date or sample location)

1.5. Task Organization

Key duties and responsibilities are listed below:

Facility Responsible Official –FRO

- Responsible for the implementation of permit and certification requirements.

Facility Quality Assurance Officer - FQAO

- Responsible for QA/QC of all self-monitoring required under the permit.
- Responsible for water quality analysis, including sampling and shipping of samples to third-party laboratories
- Responsible for QA/QC of water quality analyses under federal and state certification.

Task Lead – TL

- Responsible for assuring task is completed as defined in this QAPP
- Responsbile for reporting status of task and possible delays or deviations to FRO/FQAO

Table 2. Task Responsibilities

Name	Project Title	Responsibility
Tom Tonka	Facility Responsible Official	All FRO
Data McDaterton	Facility Quality Assurance Officer	All FQAO

1.6. Background Information

The Clean Water Act requires point source surface water dischargers obtain a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES permit will describe what discharges are allowed to surface water, monitoring and data reporting requirements, and other provisions as deemed necessary to protect receiving waters. Monitoring conducted as part of permit compliance must be conducted in a manner that complies with Federal Regulations (40 CFR Part 136) and the requirements of the NPDES Permit. This QAPP ensures that data collected and analyzed under an NPDES permit are valid and verifiable and can be used to satsisfy the requirements of the permit.

The Smallville STP treats domestic sewage using an activated sludge process. Effluent is disinfected using chlorine and then dechlorinated before discharge to Tiny Trickle Creek at Outfall 001. The permit allows the facility to discharge to the creek during the wet season only. During the dry season the facility discharges recycled water to an agricultural operation where the water is used to irrigate crops.

1.7. Task Description

NPDES permit # 00000 issued to the Smallville STP requires that the facility monitor influent and effluent to ensure that the facility complies with the effluent limits and performance standards in the permit. The Table below contains a listing of the monitoring required by the Permit.

The required samples will be collected at the locations below. Detailed descriptions of the sample locations are included in Table 3, “Summary of sampling locations”.

Sample Location and Parameter	Frequency	Season	Laboratory	Sample Type
INF				
TSS	1 x week	All year	Onsite	24 Hr Composite
BOD	1 x week	All year	Onsite	24 Hr Composite
pH	1 x day	All year	Onsite	Continuous/Grab
EFF				
TSS	1 x week	All year	Onsite	24 Hr Composite
BOD	1 x week	All year	Onsite	24 Hr Composite
pH	2 x week	Winter	Onsite	Continuous/Grab
E coli	1 x week	Winter	Onsite	Grab
Temp	3 x week	Winter	Onsite	Continuous/Grab
Residual Chlorine	1 x day	Winter	Onsite	Grab
NH3 - N	1 x month	Winter	Speedypass Anal.	24 Hr Composite
Alkalinity	1 x month	Winter	Speedypass Anal.	Grab
Nutrients (TKN, NO_2+NO_3-N, NH_3, Total Phosphorus)	1 x year		Speedypass Anal.	Grab

Recycled Water				
Total Coliforms	1 x week	Summer	Onsite	Grab
Residual Chlorine	1 x day	Summer	Onsite	Grab
pH	2 x week	Summer	Onsite	Grab
BIOSOLIDS				
Nutrient and conventional parameters (% dry weight unless otherwise specified): 1) Total Kjeldahl Nitrogen (TKN) 2) Nitrate-Nitrogen (NO3-N) 3) Ammonium Nitrogen (NH4-N) 4) Total Phosphorus (P) 5) Potassium (K) 6) pH (S.U.) 7) Total Solids 8) Volatile Solids	As described in the DEQ-approved Biosolids Management Plan	Year round	Speedypass Anal.	As described in the DEQ-approved Biosolids Management Plan
As, Cd, Cu, Hg, Mo, Pb, Ni, Se, Zn, mg/kg dry weight	As described in the DEQ-approved Biosolids Management Plan	Year round	Speedypass Anal.	As described in the DEQ-approved Biosolids Management Plan
Tiny Trickle Ck.				
pH	1 x month	Year round	Onsite	Grab
Temp	1 x month	Year round	Onsite	Grab
Alkalinity	1 x month	Year round	Speedypass Anal.	Grab

Offsite laboratories specified by the permittee will perform the standard tests required by this permit. See the DMR and other sampling requirements in the permit for the parameters, sample locations, sample frequency, and sample type for all self-monitoring required by the permit.

1.8. Quality Objectives and Criteria for Measurement of Data

To be acceptable for use environmental data must meet established QC control limits. This section defines criteria for measuring or estimating the potential error of monitoring results and how to interpret the QC data as it applies to the reported environmental data.

EPA's Guidance for the Data Quality Objectives Process (QA/G-4, EPA 2006) defines two sources of error: Sampling Error (Field Variability) and Measurement Error (Measurement Variability), which each contribute to the total error.

Sampling (field) error – This error is influenced by the inherent variability of the contaminant over geographic space and time, the sample collection design, and the number of samples. It is usually impractical to measure the entire space, and limited sampling may miss some features of the natural variation of the measurement. Sampling design error occurs when the sampling design does not capture the complete variability within the environment, to the extent appropriate for making conclusions. Sampling design error can lead to random error (i.e., variability or imprecision) and systematic error (bias) in estimates of contaminant concentrations.

Measurement error – This error is the result of imperfections in the measurement and analysis system. Random and systematic measurement errors are introduced in the measurement process during sample collection, sample handling, sample preparation, sample analysis, data reduction, transmission, and storage.

Specific QA Objectives are:

Collect a sufficient number of samples, sample duplicates and field blanks to evaluate the sampling and measurement error.

Analyze a sufficient number of QC Standards, blanks and duplicate samples in the Laboratory environment to effectively evaluate results against numerical QA goals established for precision and accuracy.

Implement sampling techniques in such a manner that the analytical results are representative of the media and conditions being sampled.

Evaluate Data quality through the use of these Data Quality Indicators:

- Precision
- Accuracy/Bias
- Sensitivity
- Representativeness
- Comparability
- Completeness

Table 6 in section 2.4 lists precision and accuracy control limits for each parameter of concern.

1.8.1 Precision

Precision is estimated by measuring the variability of duplicate measurements. The best estimate of precision is the comparison of duplicate samples, both field duplicates and lab duplicates. Field duplicates help to pinpoint variability in sampling, while lab duplicates help to pinpoint analytical variability. The variability in the results obtained from duplicate samples is the sum of the sampling and analytical variability (measurement error). The variability in the results obtained from duplicate samples is the sum of the sampling and analytical variability (measurement error).

1.8.2 Accuracy/Bias

Accuracy is a measure of the error between reported test results and the true sample concentration. This error, called “bias” is made up of the two types of error, sampling error and measurement error. Accuracy is estimated by measuring the bias of measurement error, even though bias is due to both systematic error in sampling and measurement variability.

Systematic error attributable to sampling design must be minimized by following the procedures described in section 2. This will generally result in acceptable levels of bias.

To minimize bias, all instruments must be calibrated using appropriate reference materials. The accuracy of these materials must be documented and maintained by Smallville and by any third party laboratories. The instrument's response to the reference material (initial calibration) shall also be documented and must fall within method control limits. Immediately following the initial calibration a second source standard must be used to verify the accuracy of the calibration reference material. This must be done every time after the initial calibration.

Laboratory Control Samples (LCS) prepared with each batch of samples will be used to estimate accuracy. Where applicable, matrix spikes will be used in conjunction with the LCS to estimate the accuracy of measurement error.

1.8.3 Sensitivity

The analytical methods used must be sufficiently sensitive to determine compliance with permit limits. Analytical results should be reported to the Method Detection Limit (40 CFR 136, Appendix B) when possible. At minimum, the data will be reported to the specified Quantitation Limit (QL) listed in the permit. These QLs have been determined to be sufficiently sensitive by Oregon DEQ. The permit lists the parameters of interest for this facility and the target QL for each parameter.

If matrix interference or other analytical issue prevents the data from being reported to the sufficiently sensitive QL, the permittee will work with the permittee's lab and Oregon DEQ to demonstrate the matrix effects according to procedures described in EPA's "Solutions to Analytical Chemistry Problems with Clean Water Act Methods," March 2007.

Blank results must be less than the QL for each analyte listed in the permit. Laboratory Method Blanks (MB) must be prepared along with each LCS. See 40 CFR 136.7 for further guidance on establishing appropriate MB criteria. MB results will be used to assess the sensitivity of the method. If corrective action measures fail to resolve MB errors, results batched with the MB will be flagged with the appropriate data qualifier when reported.

1.8.4 Significant Figures and Rounding

Calculations must be made following Oregon DEQ's guidance documents for significant figures and for rounding, (https://www.oregon.gov/deq/wq/wqpermits/Pages/NPDES-Individual-Permit-Templates.aspx, see document "Use of Significant Figures and Rounding Conventions in Water Quality Permitting"), unless directed otherwise by Oregon DEQ.

1.8.5 Representativeness

Representativeness is a qualitative term used to determine whether measurements are made and physical samples are collected in such a manner that the resulting data appropriately reflects the media and phenomenon measured or studied.

Representativeness is controlled by using well defined sampling and sample handling SOPs. Standard sampling procedures must be designed so that results are representative of the matrix being sampled. Sample handling protocols for storage, preservation, and transportation must be developed to preserve the representativeness of the collected samples. Proper documentation will establish that protocols have been followed and sample identification and sample integrity assured. If it is determined that sample integrity has been compromised, data must be flagged with the appropriate data qualifier.

Sample locationswill be referenced to latitude and longitude using a GPS device. In-stream samples should be collected at or near the center of the stream channel where the water is well mixed and

representative of the ambient conditions. For every sample, the date and time at which measurements are made will be recorded, as well as the physical samples collected and method of collection (e.g. grab, 24-Hr composite). All efforts will be made to confirm the accuracy of this sample metadata. In-stream samples will be collected at a location that is free of the influence of the confluence of tributaries or point source discharges.

Quality analytical measurements with poor field duplicate precision may point to sampling problems or heterogeneous samples and thus not representative of ambient conditions. To ensure the representative data quality indicator is correct, field duplicates must be collected within 15 minutes and 15 meters of each other, where the sample matrix is assumed to be homogeneous. Evaluation of field duplicate, lab duplicate, and accuracy data will provide information if there is error in the hypothesis that the sample is homogeneous. If field duplicate data exceeds precision limits but lab duplicate and accuracy data is acceptable, the sampling design may be in error and the data may not represent the environmental conditions for which it was collected. If field duplicate data indicates representativeness is acceptable, data users may assume other project data meet representativeness objectives.

1.8.6 Comparability

To ensure data will be comparable to similar environmental data collected at other facilities, procedures for sampling, sample handling, and sample analysis will be documented and written to comply with 40 CFR 136. Smallville and any third party laboratories used should follow the analytical methods cited in Table 5, which are promulgated methods in 40 CFR Part 136 and the sampling procedures described in section 2.

1.8.7 Completeness

It is expected that samples will be collected from all sites described in this QAPP unless seasonal-related events or safety issues prevent sampling. Oregon DEQ may require re-sampling to obtain more information of qualified data.

1.9. Special Training and Certification

Facility laboratory personnel will be trained in sampling methods, sample handling, chain-of-custody, sample transport, and field and laboratory measurements. The FRO and/or the FQAO are responsible for the training of staff who perform sampling, sample handling, and analysis activities. Records will be kept on file of these training activities and may be reviewed by Oregon DEQ.

1.10. Records

Field logbooks, notebooks and/or data sheets will be filled out using waterproof or weather resistant ink and should not be erased. Changes must be made by crossing out errors and adding correct information. Logbooks should be bound with numbered pages.

Laboratory data results must be recorded on laboratory data sheets, bench sheets and/or in laboratory logbooks for each sampling event. These records as well as control charts, logbook records of equipment maintenance records, calibration and quality control checks, such as preparation and use of standard solutions, inventory of supplies and consumables, check in of equipment, equipment parts, and chemicals should be kept on file at the laboratory.

Any procedural or equipment problems must be recorded along with data results. Any deviation from this Quality Assurance Project Plan must be noted. Additional sampling and analyses should be performed

when results fall outside the specified range and when DQO's are not met. Data results submitted to Oregon DEQ will include information on field and/or laboratory QA/QC problems and corrective actions.

Chain-of-Custody or Transmission forms will be kept with the sample transport, and will accompany data results sent to Oregon DEQ when requested.

Training records and data review records will be kept on file in the facility's laboratory and will be available on request by Oregon DEQ.

All records and documents must be kept at the Smallville STP laboratory according to the schedule specified in the permit and are available to EPA and Oregon DEQ for inspection at any time. Records may be kept either in hard-copy or in electronic format, or both.

1.10.1 Analytical Reports

Data will be submitted to Oregon DEQ as required by the facility permit.

Electronic versions of the final laboratory analytical data will be e-mailed to the distribution list specified in Section 1.1 in a Portable Document Format (PDF).

Analytical results generated by Smallville STP's lab will be documented on laboratory bench sheets and in the laboratory logbook. Analytical records must contain sufficient information to unambiguously link sample collection information to analytical parameters.

Analytical reports from external laboratories must contain sufficient information to unambiguously link sample collection information to the group of analytical parameters. The following elements should be addressed in the report (when applicable):

- COC Documentation
- Holding Times
- Method Detection Limits
- Blank Analysis
    - Field (Trip and Equipment)
    - Method
- Quality Control
    - Spike Recovery
    - Field Duplicates
    - Laboratory Duplicates
- Data Use and Limitations

NOTE: Include tables or narratives that clearly identify all data where DQOs were not met and a discussion of the significance of each case. Data flags must be used to qualify data that does not meet quality requirements to indicate potential bias. Qualifying flags must be clearly defined in the laboratory report.

1.10.2 Field Documentation

Personnel collecting samples will use COC/field data sheets to document significant events, observations, and measurements during field investigations. This record may include water level data, field measurements, significant weather observations, and unusual physical conditions should they exist. All entries in the COC/field data sheets should be signed and dated. The COC/field data sheets will be kept as a permanent record.

2. Data Generation and Acquisition

2.1. Sampling Process Design

All samples must be collected in the appropriate sample containers, preserved as identified in the appropriate reference methods. Samples must also arrive at the analytical laboratory within the appropriate sample holding times, with the appropriate documentation, and under the appropriate sample transport conditions. In cases where an external analytical laboratory analyzes samples for the permittee, the external lab assumes no responsibility for the quality of data resulting from samples that were collected, shipped or stored under inappropriate conditions.

The locations and media to be sampled are summarized in Table 3

Table 4. Summary of sampling locations

Name	Description	Lat/Long (deg)	Sample media
EFF Effluent Grab and Composite	EFF is located at the quelling chamber ahead of the v notch weir and downstream from the dechlorination vault. Composite sample to be taken from the middle third of the channel and the middle third of the channel depth, in the middle third of the length of the quelling chamber. Grab sample to be taken from the middle third of the channel, in the middle third of the length of the quelling chamber. Sample to be collected below the surface.	45.531381 -122.658239	Effuent water
INF Influent Composite	In the influent channel approximately 4 feet downstream from the self cleaning screen, from the middle third of the channel and the middle third of the channel depth.	45.531305 -122.658001	Sewage/water
RW Recycled Water	Collect at the sample port at the discharge line from the Recycled Water Pump Station	45.531031 -122.658121	Effuent water
Biosolids	As described in the DEQ-approved Biosolids Management Plan	N/A	Waste soil
Tiny Trickle Creek	Near the oak tree about 50 feet upstream from outfall 001. Mid depth at about mid stream.	45.530651 -122.657685	Ambient water

2.2. Sampling Methods

Samples and measurements taken as required by the permit must be representative of the volume and nature of the monitored discharge. When a sample is collected using a sample line, a volume of water equal to at least ten times the volume of the sample line will first be discharged through the line to clear it of standing water and possible contamination. If there is no discharge line port, the sampler may take the sample from the final effluent chamber at the designated sample location, taking all safety and contamination-prevention precautions.

Where site locations safely allow, receiving water samples should be collected from the center of the main channel, at a depth of one meter. This ensures a sample representative of environmental conditions.

Samples will be identified as "composite," "grab," or "24-hr sample" on COC forms/field data sheets.

Grab Samples

Grab samples are discrete samples taken at one location and time. Depending on the analyte of interest there may be volume, sample collection, or sample preservation requirements (see Table 4). Consult the analytical method (see Table 5) or third-party laboratory for proper collection and preservation requirements for each analyte.

24-hour Composite Sample

A 24-hour sample must consist of a minimum of four grab samples over the course of 24 hours. Samples may be a series of discrete grabs or composited via autosampler. Sample aliquots can either be of equal volume or flow proportional (typically specified in permit).

The sample collection time listed on the COC and sample bottle will be the time of the final sample composite portion.

Cleaning

All sampling equipment and sample containers must be cleaned prior to use, according to the equipment specifications or the analytical method.

All glassware and plasticware cleaned in the facility's laboratory will use the following procedure unless otherwise noted.

1. Wash glassware and plasticware with phosphate-free detergent and rinse with tap water.
2. Rinse with 10% hydrochloric acid (HCl) one time per month.
3. Rinse four times with deionized water."

2.3. Sample Handling and Custody Procedures

Sample handling, preservation, and holding times will follow those approved by EPA in 40 CFR 136.3. Sample container, minimum sample volume, preservation, and maximum storage requirements for each parameter are listed in Table 4 below. When samples are transferred to an outside contracted laboratory, Chain of Custody (COC) forms must be filled out and must accompany the samples. When samples are transferred between personnel, such transfer will be indicated on the form with signature, date and time of transfer. The COC must remain with the samples, sealed inside the cooler, until receipt by the contracted laboratory. Samples and sample containers must be maintained in a secure environment, from the time the

bottles leave the facility until the time the samples are received at thelaboratory. Contracted laboratories will maintain custody of bottles and samples using their normal custody procedures.

A summary of the sampling containers, preservation requirements, and holding times is presented below:

Table 5. Summary of sampling parameters

Sample Type	Method	Container	Preservation	Holding Time
Temperature	SM 2550 B	N/A	N/A	15 minutes
Escherichia Coli (E.Coli)	180.1/SM 2130 B	IDEXX 120ml	NaS_2O_3 Cool 4°	8 hrs
Bacteria - Total Coliform only	SM 9222 D	IDEXX 120ml	NaS_2O_3 Cool 4°	8 hrs
Total Suspended Solids	SM 9222 D	Poly 1000ml	Cool 4°	7 days
pH	SM 2540 D		N/A	15 minutes
Ammonia	150.2/SM 4500-pH B	Poly 500ml	<2 pH, H_2SO_4 Cool 4°	28 days
Nitrate/Nitrite	EPA 350.1	Poly 500ml	<2 pH, H_2SO_4 Cool 4°	28 days
Total Kjeldahl Nitrogen	353.2/4500 NO3F	Poly 500ml	<2 pH, H_2SO_4 Cool 4°	28 days
Biochemical Oxygen Demand, 5 Day	4500NorgD	Poly 1000ml	Cool 4°	48 hrs
Chlorine, Total Residual	5210 B	Poly or glass	N/A	15 minutes

2.4. Analytical Methods

Contaminants of concern for this project are listed in the permit. All laboratories involved with compliance monitoring for this facility must make analytical SOPs available upon request. The laboratories' analytical SOPs must cite EPA-approved methods as found in 40 CFR Part 136.3 or its updates.

A summary of the analytical parameters, the analytical methods used, and their precision and accuracy values is provided in the table below.

Table 6. Summary of analytical parameters and methods

Sample Type	Analytical Parameters	Reference Method	Precision (RPD)	Accuracy			
				MS	LCS	CCV	ICV
Effluent & Influent	Flow	N/A	N/A	N/A	N/A	N/A	N/A
Effluent & Influent	Temperature	2550 B	±0.5	N/A	N/A	N/A	≤±0.5
Effluent	Turbidity	SM 2130 B	±20%	N/A	N/A	±10%	±10%
Effluent	Escherichia Coli (E.Coli)	SM 9223B	0.6 (log)	N/A	Positive Confirmation	N/A	N/A

Effluent	Enterococcus	SM 9222 D	0.6 (log)	N/A	Positive Confirmation	N/A	N/A
Effluent	Bacteria - Total Coliform only	SM 9222 D	0.6 (log)	N/A	Positive Confirmation	N/A	N/A
Effluent	Total Suspended Solids	2540 D	±20%	N/A	± 20%	N/A	N/A
Effluent	Turbidity	180.1/2130 B	±20%	N/A	± 10%	±10%	±10%
Effluent & Influent	pH	150.2/4500-pH B	±0.2 pH	N/A	± 0.1 pH	±0.2pH	±0.1 pH
Effluent	Ammonia	EPA 350.1	±20%	±20%	±10%	±10%	±10%
Effluent	Nitrate/Nitrite	353.2/4500NO_3F	±10%	±20%	± 10%	±10%	±10%
Effluent	Total Kjeldahl Nitrogen	4500N_{org}D	±20%	± 20%	±20%	±10%	±10%
Effluent	Biochemical Oxygen Demand,5 Day	5210 B	±10%	N/A	±15%	N/A	N/A
Effluent	Chlorine, Total Residual	4500CL G	±20%	NA	±10%	NA	±10%

2.5. Quality Control

The Facility Quality Assurance officer (FQAO) will ensure that Quality Assurance sample analyses are performed in accordance with the table below. Samples taken during the current month will be considered a batch for QC evaluation. Variation of duplicate values for each parameter must not exceed the range of precision and accuracy discussed in Table 5 above. Any problems found with data collected must be noted on the data sheets, results, and in laboratory logbooks. The FQAO initials any changes to data.

With the knowledge of an unacceptable error in the QC measurement (as defined in Table 6 above), environmental samples within the QC batch must either be reprocessed (if possible) after improvements are made to minimize the observed error, or the data must be flagged as not meeting the quality control standard. If more than one of the same QC is performed in the batch only the environmental data preceding the failed QC must be qualified (flagged). Batch QC control limits are summarized in Table 6.

Table 6. Summary of Quality Assurance sampling frequencies

Sample Type	Field Duplicate	Laboratory Duplicate	Equipment Blank	Laboratory Control Sample	Matrix Spike	Other QA
Temperature	N/A	N/A	N/A	N/A	N/A	Annual calibration with NIST Certified Thermometer
Escherichia Coli (E.Coli)	1/mo	N/A	N/A	N/A	N/A	1/year Proficiency test
Bacteria - Total Coliform only	1/mo	N/A	N/A	N/A	N/A	1/year Proficiency test
Total Suspended Solids	N/A	1/mo	N/A	N/A	N/A	1/year Proficiency test
Biochemical Oxygen Demand, 5 Day	N/A	1/mo	N/A	N/A	N/A	1/year Proficiency test
pH	1/wk	N/A	N/A	N/A	N/A	Daily calibration
Ammonia	1/year	Offsite lab	Offsite lab	Offsite lab	Offsite lab	Offsite lab
Nitrate/Nitrite	1/year	Offsite lab	Offsite lab	Offsite lab	Offsite lab	Offsite lab
Alkalinity	1/year	Offsite lab	Offsite lab	Offsite lab	Offsite lab	Offsite lab
Chlorine, Total Residual	1/wk	N/A	N/A	N/A	N/A	Daily calibration

All Quality Assurance monitoring results are required monitoring records and must be maintained at the facility and made available for review by Oregon DEQ upon request.

2.5.1 Location:

Environmental data generated from samples collected at a station may be flagged based on observations made by the sampling team and supporting data. The sampling station should appear to be indicative of normal homogeneous ambient conditions. Access to the sample location within the stream should not be impaired. The sampling team will note on their field sheet if an obstacle prevents collecting the sample at the specified location and time.

2.6. Instrument/Equipment Testing, Inspection, and Maintenance

All analytical equipment must be maintained and inspected in accordance with the analytical method's SOPs, and/or the manufacturer's recommendations.

The laboratories will keep maintenance logs on all analytical equipment. Laboratories are expected to conduct routine maintenance procedures and follow the manufacturer's recommendations. Personnel conducting peer review will find it helpful to use maintenance logs during corrective action procedures.

2.7. Instrument Calibration and Frequency

All analytical and field equipment will be calibrated in accordance with the procedures in the test method and manufacturers Standard Operating Procedures.

If instruments can not be calibrated as required for use, the analyst will note this condition in the field notes or bench sheets and flag data.

2.8. Inspection/Acceptance of Supplies and Consumables

The FQAO will be responsible for maintaining records of traceability for all reagents and standards. The FQAO must validate the usability of standards and reagents upon receipt and when expiration dates are exceeded.

2.9. Data Management

Data will be entered onto field data sheets, bench sheets, and into laboratory logbooks. The FQAO or appointed designee will submit data to DEQ based on requirements in the permit. The following is a list of data information records that are kept available at the facility's laboratory for Oregon DEQ review upon request:

- Training Records
- Field equipment and chemicals maintenance, cleaning and calibration records
- Field logbooks and/or field data sheets
- COC forms
- Laboratory equipment and reagents maintenance, cleaning and calibration records
- Laboratory bench sheets, control charts
- Laboratory SOPs
- Records of QA/QC problems and corrective actions (field and/or laboratory)
- Laboratory data QC records
- Duplicate, split sample, performance evaluation records and other QA/QC control records (field and laboratory)
- Assessment records, such as Proficiency Test results
- Data review, verification and validation records

Whenever possible data results will be entered into electronic form and transferred electronically to avoid transcription errors.

3. Assessment and Oversight

3.1. Assessment and Response Actions

The FQAO will ensure that the field and laboratory forms are complete. Approximately 10% of the data sheets or logbook entries with the DMR entries should be inspected for inaccuracies. If any errors are found the FQAO will verify correct entry by comparing another 10% of the data sheets.

Should the sampling staff, laboratory personnel or FQAO find errors in sampling or analysis, the FQAO will notify the FRO and the party responsible for the error or deficiency, and will recommend methods of correcting the deficiency. The responsible party will then take action to correct the problem and will report corrections to the FQAO and FRO. See above for how this information is recorded and reported.

The FQAO will monitor the duplicate sampling and analysis activities and will review these results. The FQAO will keep these assessment records available for review by Oregon DEQ.

3.2. Reports

The data reporting schedule is specified in the NPDES permit. Monitoring results are summarized on the Discharge Monitoring Report (DMR's), described in the permit and are submitted to Oregon DEQ each month. Refer to the permit for the reporting schedule for Tier I/Tier II monitoring and Copper BLM/Aluminum BLM monitoring (if applicable), other reporting requirements.

Any improvements to QA and/or QC procedures will be implemented as necessary. Records of changes will be available for Oregon DEQ review.

4. Data Validation and Usability

The FQAO will perform at least quarterly quality checks of data to detect correctable problems. Any problems noted will be immediately brought to the attention of the FRO. Items to be checked include data sheets, logbooks, data entry, Discharge Monitoring Reports (DMR's), calibration logs and custody/transmission forms.

Questions to be considered during these quality checks include:

- Were correct methods used?
- Were holding times met?
- Were accuracy and precision within data quality objectives?
- Were reporting limits correct?
- Were lab qualifiers provided and explanations and corrective actions taken if there were anomalies in the data?
- Were records for each sampling event complete?

4.1. Data Review, Verification and Validation

The FQAO will check the accuracy and precision of data to ensure that data quality objectives are being met and that the program conforms to CFR 136.7 and the conditions outlined in the permit

Data sheets and/or logbooks must be completely filled out and signed at the time of sampling and analysis. The FQAO will review data sheets and/or logbooks for accuracy, precision, missing or illegible information, errors in calculation and values outside the expected range. Any questionable data will be brought to the attention of the field and/or laboratory personnel for resolution. The FQAO will initial any changes made to the data, and any action taken as a result of the data review will be specifically recorded on the data sheet.

When data quality indicators do not meet specifications (see Table 6) the cause of the failure will be evaluated. If the cause is equipment failure, calibration and maintenance procedures will be reassessed and improved. If the problem is procedural error, the FQAO will review methods used. If accuracy and precision goals are frequently not being met, QC procedures will be reviewed and revised.

The FQAO or appointed designee will review and initial equipment maintenance logs, sample custody forms and equipment/supply inventory and inspection forms on a quarterly basis.

Verification of data accuracy will be made by the FQAO during quarterly quality control checks, replicate analysis and split sampling checks. The FQAO during the quarterly review process will make calculations and determinations for precision and completeness. Results of accuracy, precision, and completeness calculations will be kept on file at the laboratory.

4.2. Reconciliation with User Requirements

Problems with quality sampling and analysis will be discussed with Oregon DEQ to ensure that permit requirements and QAPP data quality objectives are met. Modifications to monitoring required by permit will require modifications to the approved QAPP.

5. Revision History

Table 7. Revision History

Revision	Date	Changes	Editor

Appendices

List of Appendices

Equipment Manufacturer Calibration and Maintenance SOPS

Blank Forms

- BOD Field collection log and Bench Sheet
- TSS field collection log and Bench Sheet
- pH field collection log
- Residual Chlorine field collection log
- E coli field collection log and Bench Sheet
- Chain of Custody form for offsite lab