



January 2025
Marine Carbon Dioxide Removal Pilot Study



Sampling and Quality Assurance Plan

Prepared for Project Macoma, LLC

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FIGURE

Proposed Water Quality Sampling Locations

APPENDICES

Appendix A	Field Forms
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ABBREVIATIONS

COC	chain of custody
DGPS	differential global positioning system
DQO	Data Quality Objective
Ecology	Washington State Department of Ecology
ESM	Ecological Safety Methodology
GC	gas chromatography
HDPE	high-density polyethylene
L	liter
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
mCDR	marine carbon dioxide removal
µg/L	microgram per liter
mg/L	milligrams per liter
mL	milliliters
MS	matrix spike
MSD	matrix spike duplicate
NFG	National Functional Guidelines
NPDES	National Pollutant Discharge Elimination System
OPR	ongoing precision and recovery sample
Permit	NPDES Waste Discharge Permit
Port	Port of Port Angeles
Project Macoma, LLC	Project Macoma
PSS	practical salinity scale
PSU	practical salinity units
QA	quality assurance
QC	quality control
R	recovery
RPD	relative percent difference
SM	Standard Method
SQAP	Sampling and Quality Assurance Plan
USEPA	U.S. Environmental Protection Agency

1 Introduction and Background Information

This receiving-water characterization Sampling and Quality Assurance Plan (SQAP) has been prepared in accordance with Special Condition S9 of the Washington State Department of Ecology (Ecology)-issued National Pollutant Discharge Elimination System Waste Discharge Permit (NPDES, Permit) No. WA099105 (Ecology 2024). Project Macoma, LLC (Project Macoma), a wholly owned subsidiary of Ebb Carbon, is conducting a temporary small-scale pilot project of Ebb Carbon's marine carbon dioxide removal (mCDR) technology at Terminal 7 of the Port of Port Angeles (Port) in Port Angeles, Washington. Ebb Carbon's mCDR technology has been developed to remove carbon dioxide from the atmosphere and address coastal acidification. The Permit was issued on October 30, 2024, and will expire on November 30, 2028. This SQAP has been prepared in consultation with Ecology and is being submitted with the common understanding that Project Macoma will be operating under the conditions of the NPDES Permit. In the future, the Permit may be revised or terminated.

The SQAP has been developed to outline the procedures and standards for conducting water quality sampling and analysis in compliance with Special Condition S9 of the Permit. The plan ensures that all data collected during Project Macoma, meets rigorous scientific, regulatory, and quality standards. By following this SQAP, Project Macoma aims to provide accurate, reproducible, and high-quality data to support the evaluation of potential environmental impacts, facilitate compliance with regulatory requirements, and inform adaptive management strategies for this innovative mCDR technology. The SQAP also reflects the collaborative understanding between Project Macoma and the Washington State Department of Ecology regarding operational and data submission requirements under the NPDES Permit. As part of the Permit, Project Macoma Produced an Ecological Safety Methodology (ESM) to detail the approach to biological monitoring to meet resource agency permit requirements. The biological assessments are detailed further within the ESM, including Voluntary Supplemental Monitoring and Scientific Studies such as the Ex Situ Salmon Testing, and are not detailed further in this SQAP.

1.1 Site Description and History

Project Macoma will occupy both onshore and in-water portions of Terminal 7 of the Port. The onshore facility, located on Port-owned property currently used as a log yard, will host modular treatment equipment housed in shipping containers and tanks. This area will require minimal site preparation, leveraging existing infrastructure for access and parking. Adjacent aquatic lands, leased by the Port under a Port Management Agreement, will support the in-water operations including a barge equipped with intake and outfall systems, water pumps, and monitoring equipment.

Terminal 7, located along the Port Angeles Harbor and adjacent to the Strait of Juan de Fuca, has a long history of industrial and maritime use. Historically, the surrounding harbor area served as a hub

for log transportation, milling, and maritime trade throughout the twentieth century. Today, the Port continues to support industrial activities related to timber and marine services.

The onshore facilities will include 10 shipping containers and six tanks to support water treatment and acid-neutralization processes. Modular components such as shipping containers (up to 11.5 feet in total height), utility sheds, and an office trailer will be installed on the graded site, with additional gravel fill used to provide stable foundations and access paths. The project will use existing Port stormwater systems to manage runoff effectively. To ensure compliance with environmental and safety regulations, secondary containment measures will be implemented for any hazardous materials stored on site.

The barge, a 30-by-80-foot platform moored at Terminal 7, will house the intake and outfall systems for seawater processing. The intake pipe will feature state and federally compliant fish screening, whereas the outfall system will discharge alkaline-enhanced seawater back into the harbor through a perforated pipe submerged approximately 2 meters below the surface. Monitoring equipment installed on the barge and existing piers will collect water quality data to support adaptive management and scientific research throughout the pilot project.

1.2 Project Objectives

The project goal is to prepare receiving-water data for Ecology's future use in reasonable potential evaluations. In accordance with the Permit's requirements, at least 10 receiving-water samples will be collected per mobilization outside the zone of influence of the outfall discharge effluent.

2 Organization and Schedule

2.1 Report Organization

The remainder of this document is organized as follows:

- **Section 3—Water Quality Sampling:** This section summarizes the sampling methods and sample handling requirements for water quality sampling.
- **Section 4—Laboratory Analytical Methods:** This section summarizes methods used by the laboratory, including holding times and reporting limits.
- **Section 5—Quality Assurance and Quality Control:** This section summarizes quality assurance and control requirements for field and laboratory staff.
- **Section 6—Documentation and Records:** This section summarizes the documentation and recording procedures for all field activities, as well laboratory and data verification.
- **Section 7—Data Validation and Usability:** This section will summarize the processes and requirements for data validation and usability.
- **Section 8—Reporting:** This section summarizes reporting requirements for data collected during water quality sampling.

2.2 Project Personnel and Responsibilities

Table 1 identifies the project-specific personnel and a summary of associated responsibilities.

Table 1
Organization of Project Staff

Staff	Title
Todd Pelman(Ebb Carbon) Jeremy Loretz (Ebb Carbon)	NPDES Signatory
Tyson Mink (Ebb Carbon)	Consultant Project Manager/Field Lead
Ecology-accredited laboratories	Laboratory Director

2.3 Proposed Project Schedule

Key activities and deadlines are as follows:

- Submit SQAP for Ecology review by February 3, 2025
- Conduct all sampling and analysis in accordance with the approved Quality Assurance Project Plan, during March and April 2025
- Collect baseline data for water quality prior to the beginning of the operation during March and April 2025
- Submit the baseline study report to Ecology by May 5, 2025

3 Water Quality Sampling

This section describes the methods to be used for the collection of water quality samples. A total of 10 water quality samples will be collected at five locations, shown in Figure 1, per mobilization. Two mobilizations are planned, with one occurring in winter 2025 prior to initial operations (wet season), and another will occur in summer 2025 (dry season), when the facility is not operating. Sample locations are located approximately 750 feet from the diffuser site. Two samples will be collected from each station: samples will be collected from 1 meter below the water surface and 1 meter above the mudline. These depths were selected to capture the mixing zone associated with potential effluent discharge.

Samples will be analyzed for chemical contaminants, including total suspended solids, temperature, pH, salinity, and for the following total metals: arsenic, cadmium, chromium, lead, mercury, nickel, selenium, and zinc.

3.1 Station and Sample Identifiers

Each sample will be assigned a unique alphanumeric identifier. The identifier will be in the format of "Project Identifier-Station ID-Media Code-Sample Interval-Date" and samples will be identified as follows:

- The project designator "PM" will denote Project Macoma.
- The media code "SW" will denote surface water samples collected 1 meter below the water surface.
- The media code "BW" will denote water samples collected 1 meter above the bottom surface.
- The station identification will correspond to the station location (Figure 1).
- The date of collection will be presented in "MMDDYY" format.
 - Example: a surface water sample collected on March 20, 2025, from Station 04 will have an identification number of **PM-SW-04-032025**.
- Field duplicates will be identified by adding 100 to the location ID.
 - Example: **PM-SW-104-032025** is the field duplicate of sample "PM-SW-04-032025."

Each sample will have an adhesive plastic or waterproof paper label affixed to the container and will be labeled at the time of collection. The following information will be recorded on the container label at the time of collection:

- Project name
- Sample identifier
- Date and time of sample collection
- Analysis to be performed

3.2 Station Positioning

Station locations are listed in Table 2 and shown in Figure 1. Horizontal positioning will be determined in the field by a differential global positioning system (DGPS) based on target coordinates. Target coordinates are provided in Table 2. The horizontal datum will be the Washington State Plane North American Datum of 1983 in U.S. survey feet. Measured geographical coordinates for station positions will be recorded and reported to the nearest 0.01 second. In addition, state plane coordinates will be reported to the nearest foot. The DGPS accuracy is less than 1 meter and generally less than 30 centimeters, depending on the satellite coverage and the number of data points collected.

Table 2
Target Sample Locations

Location ID	Station Coordinates		Collection Method	Sample ID
	Longitude	Latitude		
PM-SW-01	-123.45866	48.13119	Grab	PM-SW-01-MMDDYY
PM-BW-01			Grab	PM-BW-01-MMDDYY
PM-SW-02	-123.45663	48.13133	Grab	PM-SW-02-MMDDYY
PM-BW-02			Grab	PM-BW-02-MMDDYY
PM-SW-03	-123.45492	48.13058	Grab	PM-SW-03-MMDDYY
PM-BW-03			Grab	PM-BW-03-MMDDYY
PM-SW-04	-123.45429	48.12928	Grab	PM-SW-04-MMDDYY
PM-BW-04			Grab	PM-BW-04-MMDDYY
PM-SW-05	-123.45502	48.12800	Grab	PM-SW-05-MMDDYY
PM-BW-05			Grab	PM-BW-05-MMDDYY

Notes:

BW: Bottom water location (1 meter above mudline)

SW: Surface water location (1 meter below water surface)

3.3 Sample Collection and Processing Methods

Surface water sample processing will be performed on the boat operated by Anchor QEA or a qualified vendor/consultant. A Van Dorn sampler will be used to collect surface water from the target sampling depth. Sample processing will be performed as follows:

1. Maneuver the sampling vessel to the proposed sampling location using the navigation system.
2. The sampling location must be within ± 20 meters of the proposed station.
3. The Permit requires the sampling time must be as close as possible to the critical period. However, this requirement is no longer applicable due to the discontinuance of process wastewater discharges.
4. Measure the depth of water using a lead line or handheld depth finder.

5. Using a decontaminated Van Dorn sampler, set the device so that the end stoppers are pulled away from the body, allowing surface water to enter the tube.
6. Lower the sampling device to the predetermined depth. Avoid disturbance of the bottom.
7. When the Van Dorn is at the required depth, send the weighted messenger down the suspension line, closing the sampling device.
8. Retrieve the sampler and discharge the first 10 to 20 milliliters (mLs) from the drain to clear potential contamination from the valve. This procedure may be repeated if additional sample volume is needed to fulfill analytical requirements. Subsequent grabs may be composited or transferred directly to appropriate sample containers.
9. Fill the appropriate prelabeled laboratory containers directly from the sampler.

A calibrated water quality probe, YSI ProDSS or similar, will be deployed in tandem with the Van Dorn at all sampling locations to collect in situ measurements for temperature and pH.

3.4 Sample Handling Requirements

Sample container requirements, holding times, and preservation requirements are provided in Table 3.

Table 3
Guidelines for Sample Handling and Preservation

Parameter	Sample Size	Container Size, Type ¹	Holding Time ²	Preservative
pH	100 mL	1L HDPE	2 hours	Cool/4°C
Total Suspended Solids	1L	1L HDPE	7 days	Cool/4°C
Arsenic	500 mL	500 mL HDPE	6 months	pH<2 1:1 nitric acid, cool/4°C
Cadmium	500 mL	500 mL HDPE	6 months	pH<2 1:1 nitric acid, cool/4°C
Chromium	500 mL	500 mL HDPE	6 months	pH<2 1:1 nitric acid, cool/4°C
Lead	500 mL	500 mL HDPE	6 months	pH<2 1:1 nitric acid, cool/4°C
Mercury	500 mL	500 mL HDPE	28 days	pH<2 1:1 nitric acid, cool/4°C
Nickel	500 mL	500 mL HDPE	6 months	pH<2 1:1 nitric acid, cool/4°C
Selenium	500 mL	500 mL HDPE	6 months	pH<2 1:1 nitric acid, cool/4°C
Zinc	500 mL	500 mL HDPE	6 months	pH<2 1:1 nitric acid, cool/4°C

Notes:

1. All sample containers will have lids with Teflon inserts.
2. Per SW-846, longer hold times may be appropriate if it can be demonstrated that the reported analyte concentrations are not adversely affected by preservation, storage, and analyses performed outside the recommended holding times.

3.4.1 Decontamination Procedures

Sample containers, instruments, working surfaces, and other items that may come into contact with sample material must meet high standards of cleanliness. All equipment and instruments used that

will be in direct contact with samples collected for analysis must be made of glass, stainless steel, or high-density polyethylene (HDPE). All reusable sampling equipment will be cleaned prior to sample collection at each station and prior to sample collection of each interval.

The decontamination procedure is as follows:

- Rinse with site water and wash with scrub brush until free of any visible contaminant.
- Wash with a solution of tap water and biodegradable phosphate-free detergent (e.g., Alconox).
- Visually inspect the equipment and repeat the scrub and rinse step, if necessary.
- Rinse with tap water.
- Rinse three times with distilled water.

3.4.2 Investigation-Derived Waste

All disposable sampling materials and personal protective equipment used in sample collection and processing (e.g., disposable gloves and paper towels) will be placed in heavy-duty garbage bags for disposal as nonhazardous solid waste. No hazardous materials requiring disposal will be used during field work for this effort.

3.4.3 Sample Handling

Samples are in one's custody if they are in the custodian's possession or view, in a secured location (i.e., under lock) with restricted access, or in a container that is secured with official seals such that the sample cannot be reached without breaking the seals.

Chain-of-custody (COC) procedures will be followed for all samples throughout the collection, handling, and analysis process. The principal document used to track possession and transfer of samples is the COC form. Each sample ID will be listed on an electronic or handwritten COC form the day it is collected. All data entries will be made using indelible ink pen. Corrections will be made by drawing a single line through the error, writing in the correct information, and then dating and initialing the change.

A COC form will accompany each shipment of samples to the analytical laboratories. Each person who has custody of the samples will ensure that the samples are not left unattended unless properly secured. Copies of all COC forms will be retained in the project files. All samples will be shipped or hand-delivered to the analytical laboratory no later than the day after collection. Samples collected on Friday may be held until the following Monday for shipment, provided that this does not jeopardize any hold time requirements. Specific sample shipping procedures are as follows:

- Each cooler or container holding the samples for analysis will be hand-delivered the day of sample collection, couriered, or shipped via overnight delivery to the appropriate analytical laboratory. If Saturday delivery is required, the field lead will contact the analytical

laboratories before 3:00 p.m. on Friday to ensure that the laboratory is aware of the number of containers shipped and the airbill tracking numbers for those containers.

- Ice will be sealed in separate plastic bags and placed in the shipping containers.
- Individual samples will be placed in a sealable plastic bag, packed to prevent breakage, and transported in a sealed ice chest or other suitable container.
- Glass jars will be separated in the shipping container by shock-absorbent material (e.g., bubble wrap) to prevent breakage.
- If the samples are transferred using a commercial shipping company, the following procedures will be followed:
 - The shipping containers will be clearly labeled with sufficient information (name of project, time and date container was sealed, person sealing the container, and consultant's office name and address) to enable positive identification.
 - COC forms will be enclosed in a plastic bag and placed inside the cooler.
 - Two signed and dated COC seals will be placed on adjacent sides of each cooler prior to shipping.
 - Each cooler will be wrapped securely with strapping tape, labeled "Glass: Fragile" and "This End Up," and clearly labeled with the laboratory's shipping address and the consultant's return address.

Upon transfer of sample possession to the analytical laboratory, the persons transferring custody of the sample container will sign the COC form. Upon receipt of the sample at the laboratory, the person receiving the sample will sign the COC form.

All samples received at the laboratory will be checked for label identification and complete, accurate COC documentation. The condition of the samples will be checked, and the temperature blank will be measured and recorded (with a calibrated digital thermometer) immediately after the cooler is opened. These results, along with any questions or comments regarding sample integrity, will be recorded on the COC form (or the appropriate laboratory cooler receipt form). The laboratory will contact the samplers immediately if discrepancies between the samples and COC records are found upon receipt. If it is necessary for the receiving laboratory to ship samples to other laboratories, a COC form will be completed and will accompany the samples. A copy of the COC form (and cooler receipt form) will be emailed to the sampling company within 2 days of sample receipt and included in the final analytical data report.

Once received at the laboratory, the samples will be maintained at $4^{\circ}\text{C} \pm 2^{\circ}\text{C}$, unless it is required that the samples be held at a lower temperature ($-10^{\circ}\text{C} \pm 10^{\circ}\text{C}$) to extend the holding time.

If a sample container is received broken, a sample is received in an inappropriate container, or a sample has not been preserved by appropriate means, the laboratory will notify the identified

sampling contact as soon as possible on the day of sample receipt. The laboratory sample custodian will be responsible for logging the samples in, assigning a unique laboratory identification number to each sample, labeling each sample bottle with its laboratory identification number, and moving the samples to appropriate storage locations to await analysis. The project name, field sample code, date sampled, date received, analysis required, storage location and date, and action for final disposition will be recorded in the laboratory tracking system. Relevant custody documentation will be placed in the project file.

4 Laboratory Analytical Methods

This section summarizes the analytical methods for the required water quality parameters. All work associated with this project will follow current Ecology and U.S. Environmental Protection Agency (USEPA) protocols for sampling and analysis. Analytical parameters, analytes, methods, and reporting limits are noted in Table 4.

4.1 Planned Chemical Analysis

Physical and chemical testing is assumed to be conducted at an Ecology-accredited laboratory. This SQAP has applied specific information provided by Ecology-accredited Analytical Resources, LLC, located in Tukwila, Washington, to identify applicable limits. Analytical Resources is also accredited under the National Environmental Laboratories Accreditation Program and Washington State Accreditation Program. In completing chemical analyses for this project, the contract laboratory is expected to meet the following minimum requirements:

- Adhere to the methods outlined in this SQAP, including method referenced for each analytical procedure.
- Deliver PDF and electronic data, as specified.
- Meet reporting requirements for deliverables.
- Meet turnaround times for deliverables.
- Implement quality assurance (QA)/quality control (QC) procedures as discussed in Section 5.
- Notify the project QA/QC manager of any QA/QC problems where they are identified to allow for quick resolution.
- Allow laboratory data audits to be performed, if deemed necessary.

Table 4
Analytical Parameters, Methods, and Reporting Limits

Parameter	Analytical Method	Reporting Limits		
			Detection Level (µg/L)	Quantitation Level (µg/L)
Conventional Parameters (mg/L)				
pH	SM4500-H+ B	0.01 pH units	—	—
Total Suspended Solids	SM2540-D	1.0	—	5 mg/L
Non-Conventional Parameters				
Salinity	SM2520B	—	—	3 practical salinity units or scale (PSU or PSS)
Temperature (maximum 7-day average)	Analog recorder or micro-recording devices known as thermistors	—	—	0.2°C
Metals (Total) (µg/L)				
Arsenic	EPA 6020B	0.200	0.1	0.5
Cadmium	EPA 6020B	0.100	0.05	0.25
Chromium	EPA 6020B	0.2	0.2	1
Lead	EPA 6020B	0.100	0.1	0.5
Mercury	EPA 1631E	0.100	0.0002	0.0005
Nickel	EPA 6020B	0.1	0.1	0.5
Selenium	EPA 6020B	0.500	1	1
Zinc	EPA 6020B	6.00	0.5	2.5

Note:

— : not applicable

5 Quality Assurance and Quality Control

All samples will be maintained according to the appropriate holding times and temperatures for each analysis (see Table 3). Analytes, analytical methods, and target reporting limits for chemical testing are presented in Table 4. QA/QC sample analytical frequencies are in Table 5, and analytical data quality control objectives are in Table 6. The analytical laboratory will prepare Level 2 reports as outlined in Section 5.2.

This section describes the laboratory and field QA/QC procedures to be followed to ensure that data are of known and acceptable precision and accuracy, so project objectives are achieved. These procedures include analytical and field QC requirements.

5.1 Field Quality Control

Field QC samples will include field duplicates and will be analyzed to identify and evaluate field heterogeneity. Field QC will be documented in the field log book and verified by the project manager or designee. Each field duplicate sample will be collected for the suite of chemical analyses designated for the original sample. The analytical Data Quality Objective (DQO) for field precision is plus or minus 50% relative percent difference (RPD).

5.2 Chemistry Laboratory Quality Control

Internal laboratory QC checks will be used to monitor data integrity. These checks will include method blanks, matrix spikes (MSs) (and matrix spike duplicates [MSDs]), laboratory control samples (LCSs) (and laboratory control sample duplicates [LCSDs]), internal standards, surrogate standards, calibration standards, and reference material standards. Project-required control limits listed in Table 6 will be used to evaluate MS/MSD and LCS/LCSD percent recoveries and RPD values. Surrogate recoveries will be evaluated using laboratory control limits. Laboratory control charts will be used to determine long-term instrument trends.

Results of QC samples from each sample group will be reviewed by the analyst after a sample group has been analyzed. The QC sample results will then be evaluated to determine whether control limits have been exceeded. If control limits are exceeded in the sample group to the point where data would be severely affected, the QA/QC manager will be contacted, and corrective action (e.g., method modifications followed by reprocessing of the affected samples) will be initiated prior to processing a subsequent group of samples.

All primary chemical standards and standard solutions used in this project will be traceable to the National Institute of Standards and Technology; Environmental Resource Associates; National Research Council of Canada; or other documented, reliable, commercial sources. Standards will be

validated to determine their accuracy by comparison with an independent standard. Any impurities found in a standard will be documented.

5.2.1 *Method Blanks*

Method blanks are analyzed to assess possible laboratory contamination at all stages of sample preparation and analysis. The method blank for all analyses must be less than the method reporting limit of any single target analyte/compound. If a laboratory method blank exceeds this criterion for any analyte/compound, and the concentration of the analyte/compound in any of the samples is less than five times the concentration found in the blank (10 times for common contaminants), analyses must stop, and the source of contamination must be eliminated or reduced.

5.2.2 *Laboratory Control and Ongoing Precision and Recovery Samples*

LCSs and ongoing precision and recovery samples (OPRs) are prepared and analyzed to assess possible laboratory bias at all stages of sample preparation and analysis. The LCS is a matrix-dependent spiked sample prepared at the time of sample preparation along with the preparation of samples, method blanks, and MSs. The LCS and OPR will provide information on the accuracy of the analytical process and, when analyzed in duplicate, will provide precision information as well.

5.2.3 *Matrix Spike/Matrix Spike Duplicate*

MSs/MSDs will be performed on project-specific samples either at a frequency of 5% or once per analytical batch, whichever is more frequent. Analysis of MS samples provides information on the preparation and/or analytical efficiency of the method for the sample matrix. By performing duplicate MS analyses, information on the precision of the method is also provided. MS/laboratory duplicates can be performed in place of MSs/MSDs for precision information.

5.2.4 *Surrogate Spikes*

Surrogates are compounds that are unlikely to occur under natural conditions and have properties similar to the analytes of interest. Surrogates are added to the samples prior to purging or extraction and are primarily used for organic samples analyzed by gas chromatography (GC)/mass spectrometry and GC methods. The surrogate spike provides broader insight into the proficiency and efficiency of an analytical method on a sample-specific basis. This control reflects analytical conditions that may not be attributable to the sample matrix. All project samples and associated sample QC to be analyzed by organic methods will be spiked with appropriate surrogate compounds as defined in the analytical methods.

5.2.5 *Laboratory Duplicates*

For inorganic and high-resolution mass spectrometry analyses, laboratory duplicates will be analyzed to assess laboratory precision. A laboratory duplicate is defined as a separate aliquot of a sample

that is analyzed as a separate sample. An MSD, OPR duplicate, or LCSD may be analyzed in lieu of a laboratory duplicate.

5.2.6 Instrument Performance Checks

Instrument performance checks are analyzed on mass spectrometer instruments to ensure ion ratios and abundances are adequate to proceed with subsequent analyses.

5.2.7 Calibration Standards

Initial calibration standards are analyzed prior to sample analyses and establish the response to concentration ratios to quantify the sample concentrations. Initial calibrations are established prior to any other analyses except instrument performance checks. Calibration check standards analyzed within a particular analytical series provide information regarding instrument stability and validity of the instrument calibration. The analytical frequency of calibration check standards is specified by the analytical method.

5.2.8 Standard Reference Materials

Standard reference materials are substances of the same or similar matrix to the project samples and contain a known concentration of target analytes. These materials are prepared and analyzed in the same manner as routine samples and in the same preparation and analytical batch. The recovery of the target analytes provides information on interferences caused by the sample matrix. A standard reference material may be used in lieu of an LCS.

Table 5
Field and Laboratory Quality Assurance/Quality Control Analysis Summary

Analysis Type	Field Duplicates	Initial Calibration	Ongoing Calibration	Laboratory Control Sample	Matrix Duplicates ²	Matrix Spikes	Matrix Spike Duplicates ²	Method Blanks	Surrogate Spikes
pH	1 per 20 samples	Daily or each batch ¹	—	—	1 per 20 samples	—	—	—	—
Total Suspended Solids	1 per 20 samples	Daily or each batch ¹	—	—	1 per 20 samples	—	—	—	—
Metals	1 per 20 samples	Daily or each batch	1 per 10 samples	1 per 20 samples	1 per 20 samples	1 per 20 samples	—	1 per 20 samples	—

Notes:

1. Calibration and certification of drying ovens and weighing scales are conducted biannually.
 2. A matrix spike duplicate may be analyzed in place of a laboratory duplicate and vice versa.
 3. Initial calibrations are considered valid until the ongoing continuing calibration no longer meets method specifications. At that point, a new initial calibration is performed.
- : not applicable

6 Documentation and Records

Records will be maintained documenting all activities and data related to sample collection activities and laboratory analyses. Results of data verification and validation will also be documented.

Procedures for documentation of these activities are described in this section.

6.1 Field Records

Sample collection activities will be documented on field collection logs. Additionally, the field staff will keep a daily record of significant events, observations, and measurements on a daily log. Entries for each day will begin on a new page. The person recording information must enter the date and time and initial each entry.

The daily log will contain the following information, as applicable to the task:

- Project name
- Field personnel on site as well as time present on site
- Site visitors
- Weather conditions
- Field observations
- Maps and/or drawings
- Sample collection date and time
- Sample collection method and description of activities
- Deviations from this SQAP

7 Data Validation and Usability

Data generated in the field and at the laboratories will be verified and validated according to methods and procedures described in this section.

7.1 Data Review, Validation, and Verification

During the validation process, analytical data will be electronically and/or manually evaluated for method and laboratory QC compliance, and their validity and applicability for program purposes will be determined.

Based on findings of the validation process, data validation qualifiers may be assigned. Validated project data, including qualifiers, will be entered into the project database, thus enabling this information to be retained or retrieved as needed.

7.2 Validation and Verification Methods

Laboratory data will be provided in both PDF and the sampling consultant's electronic format and uploaded to their project database. Once data are received from the laboratory, a number of QC procedures will be followed to provide an accurate evaluation of data quality.

Stage 2B validations (USEPA 2009) will be performed for all testing parameters.

Data quality review will be completed by Anchor QEA (or qualified consultant/subconsultant) in accordance with USEPA National Functional Guidelines (NFG) for Data Review (USEPA 2020a, 2020b) by considering the following:

- Data completeness
- Holding times
- Method blanks
- Surrogates
- Detection and reporting limits
- LCSs
- LCSDs
- Replicates
- MS/MSD samples
- Initial and continuing calibrations
- Internal standard area counts
- Standard reference materials

Data will be validated in accordance with the project-specific data QC objectives (Table 6), analytical method criteria, and the laboratory's internal performance standards based on its standard operating

procedures. The results of the data quality review, including assigning qualifiers in accordance with the NFG and a tabular summary of qualifiers, will be generated by the database manager and submitted to the QA/QC manager for final review and confirmation of data validity.

Laboratory data, which will be electronically provided to Ebb Carbon and loaded into the sampling consultant's project database, will undergo a check against the laboratory hard copy data. Data will be validated or reviewed manually, and qualifiers, if assigned, will be entered manually. The accuracy of all manually entered data will be verified by a second party. Data tables and reports will be exported from database to Excel tables.

Field datasheets or data entries will be checked for completeness and accuracy prior to database entry. Data generated in the field will be documented electronically or on hard copy and provided to the database manager who is responsible for data entry into the database. Manually entered data will be checked by a second party. Field documentation will be filed in the main project file after data entry and checking are complete.

7.3 Reconciliation with User Requirements

The QA/QC manager will review data at the completion of the task to determine whether DQOs have been met.

If data do not meet the project's specifications, the QA/QC manager will review the errors and determine whether the problem is due to calibration and maintenance, sampling techniques, or other factors and will suggest corrective action, if appropriate. The problem will be corrected by retraining, revising techniques, or replacing supplies or equipment. If the problem is not due to the aforementioned factors, the DQOs will be reviewed for feasibility. If specific DQOs are not achievable, the QA/QC manager will recommend appropriate modifications. If matrix interference is suspected to have contributed to the exceedance, adequate laboratory documentation must be presented to demonstrate that instrument performance or laboratory technique did not bias the result. In cases where the DQOs have been exceeded and corrective actions did not resolve the outlier, data will be qualified per NFG. In these instances, the usability of data will be determined by the extent of the exceedance.

Rejected data will be assigned an "R" qualifier and will not be used for any purposes. Data qualified with a "J" flag will be used, but the basis for the "J" flag will be documented in the data validation report, and data uncertainties will be considered during use of the data for project reporting.

Table 6
Data Quality Control Objectives

Parameter	Precision	Accuracy ¹	Completeness
pH	± 20 RPD	—	95%
Total Suspended Solids	± 20 RPD	—	95%
Metals	± 30 RPD	75% to 125% R	95%

Notes:

1. LCS and MS/MSD percent recovery.

— : not applicable

8 Reporting

All sampling data will be summarized in a Water Quality Data Report to be submitted to Project Macoma and Ecology. The Water Quality Data Report will include the following sections:

- Site background and context
- Sampling objectives and methods
- Method deviations in sampling or analysis from this SQAP
- Results of sampling, including some or all the following:
 - A table of sample coordinates, collection equipment and protocol used for each sample, water depth at each location, and the time of sample collection
 - A figure showing actual sampling locations
 - Results of chemical testing analyses: table of analyzed concentrations for all contaminants of concern, laboratory qualifiers, method reporting limits, and method detection limits
 - Laboratory data reports, including the case narrative and COC forms, included as an appendix to the report
 - Copies of data validation reports, included as an appendix to the report
 - Field logs (i.e., daily and collection logs), included as an appendix to the report

Following submittal and review of the Water Quality Data Report, all testing data will be uploaded to Ecology's Environmental Information Management System database.

9 References

Ecology (Washington State Department of Ecology), 2024. Fact Sheet for NPDES Permit WA099105
December 1, 2024

USEPA (U.S. Environmental Protection Agency), 2009. *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use*. U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response. USEPA 540-R-08-005. January 2009.

USEPA, 2020a. *National Functional Guidelines for Organic Superfund Methods Data Review*. Office of Superfund Remediation and Technology Innovation. United States Environmental Protection Agency. USEPA-540-R-20-005. November 2020.

USEPA, 2020b. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. Office of Superfund Remediation and Technology Innovation. USEPA-540-R-20-006. November 2020.

Figure



Publish Date: 2025/01/15, 11:01 AM | User: tweldy
Filepath: \\GSTFile01\GIS\Jobs\Ebb_Carbon_2331\Maps\reports\AQ_EbbCarbon_SQA\AQ_EbbCarbon_SQA.aprx | AQ_SQA_Fig1_SamplingLocations



Figure 1
Proposed Water Quality Sampling Locations
Sample and Quality Assurance Plan
Project Macoma, LLC

Appendix A

Field Forms

Daily Log



Anchor QEA
1201 3rd Avenue, Suite 2600
Seattle, WA 98101
Phone 206.287.9130 Fax 206.287.9131

PROJECT NAME: _____

DATE: _____

SITE ADDRESS:

PERSONNEL:

WEATHER:	WIND FROM:	N	NE	E	SE	S	SW	W	NW	LIGHT	MEDIUM	HEAVY
		SUNNY		CLOUDY		RAIN		?	TEMPERATURE:		° F	° C
[Circle appropriate units]												

[illegible]

Signature: _____

DAILY FLOAT PLAN

Today's Date: _____

Vessel Name: _____

Operator: _____

Departure Time: _____ Expected Time of Return: _____

Cell Phone Number(s) _____

Office Contact Person Notified of
Departure and Return: _____

Destination and Itinerary:

Names of Personnel on Board:

If expected time of return is exceeded by 1 hour, the following steps will be taken:

1. Office Contact Person will attempt to contact crew members.
2. Office Contact Person will notify Field Manager, if not the same person.

If Office Contact Person is not able to establish contact with crew the following steps will be taken in a logical order:

1. Field Manager will contact Health and Safety Officer.
2. Field Manager will contact Project Manager.
3. Local hospitals and emergency centers will be contacted.
4. Local search and rescue will be notified.

[illegible]

Received By:	Company: _____
Signature/Printed Name	Date/Time

Received By:		Company: _____	
Signature/Printed Name		Date/Time	

Appendix B
NPDES Permit No. WA099105 for
Project Macoma, LLC



Issuance Date: October 30, 2024

Effective Date: December 1, 2024

Expiration Date: November 30, 2028

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT WA099105**

**State of Washington
DEPARTMENT OF ECOLOGY**

Southwest Region Office
PO Box 47775
Olympia WA 98504-7775

In compliance with the provisions of
The State of Washington Water Pollution Control Law
Chapter 90.48 Revised Code of Washington
and
The Federal Water Pollution Control Act
(The Clean Water Act)
Title 33 United States Code, Section 1342 et seq

**Project Macoma, LLC
950 Commercial Street
San Carlos, California 94070**

is authorized to discharge in accordance with the Special and General Conditions that follow.

Facility Location: 1301 Marine Drive, Terminal 7 Port Angeles, WA 98363	Receiving Water: Port Angeles Harbor
Industry Type: Commercial Physical Biological Research	SIC Code: 8731 NAICS: 541715
Treatment Type: Mixed media filters, nano filtration, RO, Bipolar electrodialysis, acid neutralization	

**Andrew Kolosseus
Southwest Region Section Manager
Water Quality Program
Washington State Department of Ecology**

National Pollutant Discharge Elimination System Waste Discharge Permit WA099105 . 1

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SUMMARY OF PERMIT SUBMITTALS

Refer to the Special and General Conditions of this permit for additional submittal requirements.

Table 1 – Summary of permit submittals

Permit Section	Submittal	Frequency	First submittal date
S3.A	Discharge Monitoring Report (DMR)	Monthly	Within 45 days of the project's start
S3.F	Reporting permit violations	As necessary	
S4.A	Operations and Maintenance Manual	1/permit cycle	60 days after the completion of construction
S4.B	Reporting bypasses	As necessary	
S6	Non-routine and unanticipated discharges	As necessary	
S7	Spill Plan	1/permit cycle	March 3, 2025
S8	Ecology Safety Methodology Update	As Necessary	
S9	Receiving water study sampling and quality assurance plan	1/permit cycle	February 3, 2025
S9	Receiving water baseline study report	1/permit cycle	May 5, 2025
S10	Outfall Evaluation	1/permit cycle	December 5, 2025
S11	mCDR Intake Structure	As necessary	
S12	Acute toxicity test	Two samples/permit cycle (before scientific operations begin)	Within 45 days of sampling, no later than one year from the start of the project.
S13	Project results report	1/permit cycle	60 days after completion of the pilot project.
G1	Notice of change in authorization	As necessary	
G4	Permit application for substantive changes to the discharge	As necessary	
G5	Engineering report for construction or modification activities	As necessary	
G7	Notice of permit transfer	As necessary	
G10	Duty to provide information	As necessary	
G21	Compliance schedules	As necessary	

SPECIAL CONDITIONS

S1. Discharge limits

S1.A. Process ocean water discharges

All discharges and activities authorized by this permit must be consistent with the terms and conditions of this permit.

The discharge of any of the following pollutants more frequently than, or at a level in excess of that identified and authorized by this permit violates the terms and conditions of this permit.

Beginning on the effective date of this permit, the Permittee is authorized to discharge processed ocean water from one of the three operations (A. Routine Operations, B. Maintenance Operations, and C. Scientific Operations/Alkaline Stream) at a time through Outfall 001 to the Port Angeles Harbor at the permitted location subject to complying with the following limits shown below. **This authorization is only effective for two years from the start of the pilot project discharge.**

Table 2 – Effluent limits at the discharge point: Outfall 001

Latitude: 48.129378 Longitude: -123.457488

A. Routine Operations - all three process streams combined (neutralized acid, pretreatment reject and alkaline)

Parameter	Maximum Daily ¹
Flow	246,350 gpd
Total Suspended Solids (TSS)	30 mg/L
Temperature ²	20.4°C

Parameter	Minimum	Maximum
pH ³	7.0 standard units	9.8 standard units

¹Maximum daily effluent limit is the highest allowable daily discharge.

²Maximum temperature limit at the discharge point.

³All process water streams with pH limit at the discharge point. Flow must be metered and released slowly from the upland process holding tanks. If any negative impacts during in-water monitoring, or surveillance are noted, the permittee must cease the discharge and apply adaptive management protocol in accordance with the permit condition S8 and adjust the operation to mitigate the problem before resuming operations.

B Maintenance Operations (Neutralized acid and pretreatment reject streams Combined)

Parameter	Maximum Weekly ¹
Flow	70,000 gpd
Total Suspended Solids (TSS)	30 mg/L
Temperature ²	19.30°C

Parameter	Minimum	Maximum
pH ³	within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units.	

¹Maximum weekly effluent limit is the highest allowable weekly discharge.

²Maximum temperature limit at the discharge point.

³ pH limit at the discharge point.

C Scientific Operations (Alkaline stream)

Parameter	Maximum discharge per single tidal cycle ¹
Flow	18,700 gpd
Total Suspended Solids (TSS)	30 mg/L
Temperature ²	30°C
Tidal Conditions	Ebb tide only

Parameter	Minimum	Maximum
pH ³	7.0 standard units	12.0 standard units

¹Maximum per single tidal cycle limit is the highest allowable discharge during a single tidal cycle. This discharge is allowed a few times a month. **The permittee must notify Ecology at both the beginning and the end of the discharge.**

²Maximum temperature limit at the discharge point. Batch Flow must be metered and released slowly from the upland process holding tanks. If any negative impacts during in-water monitoring, or surveillance are noted, the permittee must cease the discharge and apply adaptive management protocol in accordance with the permit condition S8 and adjust the operation to mitigate the problem before resuming operations.

³Enhanced alkaline stream with pH limit at the discharge point. Batch flow must be metered and released slowly from the upland process holding tanks. If any negative impacts during in-water monitoring, or surveillance are noted, the permittee must cease the discharge and apply adaptive management protocol in accordance with the permit condition S8 and adjust the operation to mitigate the problem before resuming operations.

Whole Effluent Toxicity Limits for Scientific Operations (Alkaline Stream)

Whole Effluent Toxicity limits
The following whole effluent toxicity (WET) limits may apply if effluent characterization shows toxicity at ACEC
The ACEC means the maximum concentration of effluent during critical conditions at the boundary of the acute mixing zone, defined in Section S1.C of this permit. The ACEC equals 1.14 percent effluent. See S12 for more information.

Table 3 – Routine Operations Permit limits: Chronic Mixing Zone Boundary Compliance Point 001 (CP001)

Latitude: 48.12905000 Longitude: -123.45667500

Parameter	Daily Maximum Limits
Temperature (May-September) ^a	12.68°C
Temperature (October – April) ^a	11.50°C
pH ^b	within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

^a Maximum allowable temperature at the mixing zone boundary. Flow must be metered and released slowly. If any negative impacts during in-water monitoring, or surveillance are noted, the permittee must cease the discharge and apply adaptive management protocol in accordance with the permit condition S8 and adjust the operation to mitigate the problem before resuming operations.

^b pH limit at the mixing zone boundary. Flow must be metered and released slowly. If any negative impacts during in-water monitoring, or surveillance are noted, the permittee must cease the discharge and apply adaptive management protocol in accordance with the condition S8 and adjust the operation to mitigate the problem before resuming operations.

Table 4 – Scientific Operations (Alkaline stream) Permit limits: Chronic Mixing Zone Boundary Compliance Point 001 (CP001)

Latitude: 48.12905000 Longitude: -123.45667500

Parameter	Daily Maximum Limits
Temperature (May - September) ^a	12.68°C
Temperature (October - April) ^a	11.50°C
pH ^b	within the range of 7.0 to 8.5 with a human-caused variation within the above range of less than 0.5 units.

^a Maximum allowable temperature at the chronic mixing zone boundary. Batch Flow must be metered and released slowly. If any negative impacts during in-water monitoring, or surveillance are noted, the permittee must cease the discharge and apply adaptive management protocol in accordance with the permit condition S8 and adjust the operation to mitigate the problem before resuming operations.

^b Alkaline enhanced maximum pH limit at the mixing zone boundary. Flow must be metered and released slowly. If any negative impacts during in-water monitoring, or surveillance are noted, the permittee must cease the discharge and apply adaptive management protocol in accordance with permit condition S8 and adjust the operation to mitigate the problem before resuming operations.

S1.B. Biological Assessment

Project Macoma must conduct biological monitoring in accordance with the approved United States Army Corps of Engineers (USACE) Ecology Safety Methodology (ESM), in consultation with the United States Fish and Wildlife Services (USFWS), and the National Marine Fisheries Service [NMFS]). If visual observation and submersible camera show adverse changes or impacts to the aquatic vegetation and organisms, the permittee must cease operations and apply Ecology Safety Methodology/Adaptive Management protocol in accordance with the Permit condition S8 to mitigate the problem before resuming operations.

S1.C. Mixing zone authorization

Mixing zone for Outfall 001

The following paragraphs define the maximum boundaries of the mixing zones:

Chronic mixing zone

The mixing zone is a circle with radius of 207 feet measured from the center of each discharge port. The mixing zone extends from the bottom to the top of the water column. The concentration of pollutants at the edge of the chronic zone must meet Chronic Aquatic Life Criteria.

Acute mixing zone

The acute mixing zone is a circle with radius of 20.7 feet measured from the center of each discharge port. The mixing zone extends from the bottom to the top of the water column. The concentration of pollutants at the edge of the acute zone must meet Acute Aquatic Life Criteria.

Table 5 – Dilution factors

- 1) All three process streams **combined** (neutralized acid, pretreatment reject and alkaline)

Criteria	Dilution factor
Acute Aquatic Life Criteria	72
Chronic Aquatic Life Criteria	195

2) Alkaline Stream¹

Criteria	Dilution factor
Acute Aquatic Life Criteria	87.5
Chronic Aquatic Life Criteria	430

¹These dilution factors for the alkaline stream are based on the revised mixing analysis report submitted on October 8, 2024, with a pH limit of 12.0 standard units at the discharge point. These dilution factors have been divided by two to account for tidal reflux. This mixing analysis report is available on Ecology's website at the following link:

<https://apps.ecology.wa.gov/paris/DownloadDocument.aspx?id=513313>.

3) Maintenance Operations (Neutralized acid + Pretreatment reject combined)

Criteria	Dilution factor
Chronic Aquatic Life Criteria	207

S2. Monitoring requirements

S2.A. Monitoring schedule

The Permittee must monitor in accordance with the following schedule and the requirements specified in Appendix A.

Table 6 – Process water effluent (Final Sensor Location on Barge (above surface water)) outfall 001

1) Routine Operations

Latitude: 48.129378 Longitude: -123.457488

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Flow	gpd	Continuous ¹	Metered/Recorded
pH	standard units	Continuous	Metered/Recorded
Dissolved Oxygen (DO)	mg/L	Continuous	Metered/Recorded
TSS	mg/L	2/month	Composite

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Turbidity	Nephelometric Turbidity Units (NTU)	Continuous	Metered/Recorded
Temperature	°C	Continuous	Measurement/Recorded
Arsenic, total	ug/L	1/month	Grab
Cadmium, total	ug/L	1/month	Grab
Chromium	ug/L	1/month	Grab
Lead, total	ug/L	1/month	Grab
Mercury, total	ng/L	1/month	Grab
Nickel, total	ug/L	1/month	Grab
Selenium, total	ug/L	1/month	Grab
Zinc, total	ug/L	1/month	Grab

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

2) Maintenance Operations

Latitude: 48.129378 Longitude: -123.457488

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Flow	gpd	Continuous ¹	Metered/Recorded
pH	standard units	Continuous	Metered/Recorded
Dissolved Oxygen (DO)	mg/L	Continuous	Metered/Recorded
TSS	mg/L	2/month	Composite
Turbidity	Nephelometric Turbidity Units (NTU)	Continuous	Metered/Recorded
Temperature	°C	Continuous	Measurement/Recorded
Arsenic, total	ug/L	1/month	Grab
Cadmium, total	ug/L	1/month	Grab
Chromium	ug/L	1/month	Grab
Lead, total	ug/L	1/month	Grab
Mercury, total	ng/L	1/month	Grab

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Nickel, total	ug/L	1/month	Grab
Selenium, total	ug/L	1/month	Grab
Zinc, total	ug/L	1/month	Grab

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

3. Scientific Operations

Latitude: 48.129378 Longitude: -123.457488

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Flow	gpd	Continuous ¹	Metered/Recorded
pH	standard units	Continuous	Metered/Recorded
Dissolved Oxygen (DO)	mg/L	Continuous	Metered/Recorded
TSS	mg/L	2/month	Composite
Turbidity	Nephelometric Turbidity Units (NTU)	Continuous	Metered/Recorded
Temperature	°C	Continuous	Measurement/Recorded

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

Table 7 – Monitoring at the edge of chronic mixing zone boundary for Routine Operations, Compliance Point 001 (CP001)

Latitude: 48.12905000 Longitude: -123.45667500

Parameter	Units & speciation	Minimum sampling frequency	Sample type
pH	standard units	Continuous ¹	Metered/Recorded
DO	mg/L	Continuous	Metered/Recorded
Turbidity	NTU	Continuous	Metered/Recorded
Temperature	°C	Continuous	Metered/Recorded

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

Table 8 – Monitoring at Initial Dilution Zone (150 feet from the diffuser), for Routine Operations, Monitoring Point 002 (MP002)

Latitude: 48.12912778 Longitude: -123.45687778

Parameter	Units & speciation	Minimum sampling frequency	Sample type
pH	standard units	Continuous ¹	Metered/Recorded
DO	mg/L	Continuous	Metered/Recorded
Turbidity	NTU	Continuous	Metered/Recorded
Temperature	°C	Continuous	Metered/Recorded

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

Table 9 – Monitoring for Routine Operations, Monitoring Point 003 (MP003)

Latitude: 48.12890278 Longitude: -123.45709722

Parameter	Units & speciation	Minimum sampling frequency	Sample type
pH	standard units	Continuous ¹	Metered/Recorded
DO	mg/L	Continuous	Metered/Recorded
Turbidity	NTU	Continuous	Metered/Recorded
Temperature	°C	Continuous	Metered/Recorded

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

Table 10 – Monitoring at the edge of chronic mixing zone boundary for Alkaline Operations, Compliance Point 001 (CP001)

Latitude: 48.12905000 Longitude: -123.45667500

Parameter	Units & speciation	Minimum sampling frequency	Sample type
pH	standard units	Continuous ¹	Metered/Recorded
DO	mg/L	Continuous	Metered/Recorded

Parameter	Units & speciation	Minimum sampling frequency	Sample type
Turbidity	NTU	Continuous	Metered/Recorded
Temperature	°C	Continuous	Metered/Recorded

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

Table 11 – Monitoring at Initial Dilution Zone (150 feet from the diffuser), for Alkaline Operations, Monitoring Point 002 (MP002)

Latitude: 48.12912778 Longitude: -123.45687778

Parameter	Units & speciation	Minimum sampling frequency	Sample type
pH	standard units	Continuous ¹	Metered/Recorded
DO	mg/L	Continuous	Metered/Recorded
Turbidity	NTU	Continuous	Metered/Recorded
Temperature	°C	Continuous	Metered/Recorded

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

Table 12 – Monitoring for Alkaline Operations, Monitoring Point 003 (MP003)

Latitude: 48.12890278 Longitude: -123.45709722

Parameter	Units & speciation	Minimum sampling frequency	Sample type
pH	standard units	Continuous ¹	Metered/Recorded
DO	mg/L	Continuous	Metered/Recorded
Turbidity	NTU	Continuous	Metered/Recorded
Temperature	°C	Continuous	Metered/Recorded

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

Table 13 – Ambient Water Quality Monitoring (AWQ001)

Latitude: 48.12880000 Longitude: -123.45640278

Parameter	Units & speciation	Minimum sampling frequency	Sample type
pH	standard units	Continuous ¹	Metered/Recorded
DO	mg/L	Continuous	Metered/Recorded
Turbidity	NTU	Continuous	Metered/Recorded
Temperature	°C	Continuous	Metered/Recorded
Arsenic	ug/L	Monthly	Grab
Cadmium	ug/L	Monthly	Grab
Chromium	ug/L	Monthly	Grab
Lead	ug/L	Monthly	Grab
Mercury	ng/L	Monthly	Grab
Nickel	ug/L	Monthly	Grab
Selenium	ug/L	Monthly	Grab
Zinc	ug/L	Monthly	Grab

¹Continuous means uninterrupted except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 30 minutes. The permittee must describe Frequency when continuous monitoring is not possible.

Table 14 – Additional monitoring

Monitoring type	Description
Receiving Water Study	As specified in condition S 9
Acute Whole Effluent Toxicity Testing	As specified in condition S12

S2.B. Sampling and analytical procedures

Samples and measurements taken to meet the requirements of this permit must represent the volume and nature of the monitored parameters, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets, and maintenance-related conditions affecting effluent quality.

Sampling and analytical methods used to meet the monitoring requirements specified in this permit must conform to the latest revision of the Guidelines Establishing Test Procedures for the Analysis of Pollutants contained in 40 Code of Federal Regulations (CFR) Part 136 [or as applicable in 40 CFR subchapter N (Parts 400-471) or 40 CFR Subchapter O (Parts 501-503)] unless otherwise specified in this permit. Ecology may specify alternative methods only for parameters without limits and for those parameters without an EPA-approved test method in 40 CFR Part 136.

S2.C. Flow measurement, field measurement, and continuous monitoring devices

The Permittee must:

1. Select and use appropriate flow measurement, field measurement, and continuous monitoring devices and methods consistent with accepted scientific practices.
2. Install, calibrate, and maintain the devices to ensure the accuracy of the measurements is consistent with the accepted industry standard, the manufacturer's recommendation, and approved Operation and Maintenance (O&M) Manual procedures for the devices.
3. Calibrate continuous monitoring instruments weekly unless it can demonstrate a longer period is sufficient based on monitoring reports. The Permittee:
 - a. May calibrate apparatus for continuous monitoring of Dissolved Oxygen by air calibration.
 - b. Must calibrate continuous pH measurement instruments according to the manufacturer's requirements.
 - c. Must calibrate continuous Chlorine measurement instruments using a grab sample analyzed in the laboratory within 15 minutes of sampling.
4. Calibrate micro-recording Temperature devices, known as thermistors, using protocols from *Standard Operating Procedure EAP080, Version 2.2, Continuous Temperature Monitoring of Freshwater Rivers and Streams* (Ecology, 2022). Calibration as specified in this document is not required if the Permittee uses recording devices certified by the manufacturer.
5. Use field measurement devices as directed by the manufacturer and do not use reagents beyond their expiration dates.
6. Establish a calibration frequency for each device or instrument in the O&M Manual that conforms to the frequency recommended by the manufacturer.
7. Calibrate flow monitoring devices at a minimum frequency of at least one calibration per year.
8. Maintain calibration records for at least three years.

S2.D. Laboratory accreditation

The Permittee must ensure that all monitoring data required by Ecology for permit specified parameters is prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 Washington Administrative Code (WAC), Accreditation of Environmental Laboratories. Flow, temperature, settleable solids, conductivity, pH, and internal process control parameters are exempt from the requirement. The Permittee must obtain accreditation for conductivity and pH if it must receive accreditation or registration for other parameters.

S3. Reporting and recording requirements

The Permittee must monitor and report in accordance with the following conditions. Falsification of information submitted to Ecology is a violation of the terms and conditions of this permit.

S3.A. Discharge Monitoring Reports

The first monitoring period begins on the effective date of the permit (unless otherwise specified). The Permittee must:

1. Summarize, report, and submit monitoring data obtained during each monitoring period on the electronic Discharge Monitoring Report (DMR) form provided by Ecology within the [Water Quality Permitting Portal](#)¹. Include data for each of the parameters tabulated in Special Conditions S2 and as required by the form. Report a value for each day sampling occurred (unless specifically exempted in the permit) and for the summary values (when applicable) included on the electronic form.
2. Submit DMRs no later than the dates specified below, unless otherwise specified in this permit.
3. Submit DMRs for parameters with the monitoring frequencies specified in S2 (monthly, quarterly, annual, etc.) at the reporting schedule identified below. The Permittee must:
 - a. Submit **monthly** DMRs by the 15th day of the following month, within 45 days of the project's start.
4. Enter the "No Discharge" reporting code for an entire DMR, for a specific monitoring point, or a specific parameter as appropriate, if the Permittee did not discharge wastewater or a specific pollutant during a given monitoring period.
5. Report single analytical values below detection as "less than the Detection Level (DL)" by entering the < followed by the numeric value of the detection level (e.g. < 2.0) on the DMR. If the method used did not meet the minimum DL and Quantitation Level (QL) identified in the permit report the actual QL and DL in the comments or in the location provided.
6. Report single analytical values between the DL and the QL by entering the estimated value, the code for estimated value/below quantitation limit (J) and any additional information in the comments.
7. Submit a copy of the laboratory report as an attachment using WQWebDMR.
8. Report the test method used for analysis in the comments if the laboratory used an alternative method not specified in the permit and as allowed in Appendix A or Special Condition S2.

¹ <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Water-quality-permits-guidance/WQWebPortal-guidance>

9. Calculate average values and calculated total values (unless otherwise specified in the permit) using:
 - a. The reported numeric value for all parameters measured between the detection value and the quantitation value for the sample analysis.
 - b. One-half (1/2) the detection value (for values reported below detection) if the lab detected the parameter in another sample from the same monitoring point for the reporting period.
 - c. Zero (for values reported below detection) if the lab did not detect the parameter in another sample for reporting period.
10. Report single-sample grouped parameters (for example: priority pollutants, PAHs, pulp and paper chlorophenolics, TTOs) on the WQWebDMR form and include: sample date, concentration detection, DL (as necessary), and laboratory QL (as necessary).

S3.B. Permit submittals and schedules

The Permittee must use the Water Quality Permitting Portal – Permit Submittals application (unless otherwise specified in the permit) to submit all other written permit required reports by the date specified in the permit.

When another permit condition requires submittal of a paper (hard-copy) report, the Permittee must ensure that it is postmarked or received by Ecology no later than the dates specified by this permit. Send these paper reports to Ecology at:

Water Quality Permit Coordinator
Department of Ecology
Southwest Region Office
P.O. Box 47775
Olympia, WA 98504-7775

S3.C. Records retention

The Permittee must retain records of all monitoring information for a minimum of three years. Such information must include all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit. The Permittee must extend this period of retention during the course of any unresolved litigation regarding the discharge of pollutants by the Permittee or when requested by Ecology.

S3.D. Recording of results

For each measurement or sample taken, the Permittee must record the following information:

1. The date, exact place, method, and time of sampling or measurement.
2. The individual who performed the sampling or measurement.
3. The date and time the analysis was performed.
4. The individual who performed the analysis.
5. The analytical technique or method used.
6. The results of all analyses.

S3.E. Additional monitoring by the Permittee

If the Permittee monitors any listed monitoring parameters more frequently than required by Special Condition S2 of this permit, then the Permittee must include the results of such monitoring in the calculation and reporting of the data submitted in the Permittee's DMR unless otherwise specified by Special Condition S2.

S3.F. Reporting permit violations

The Permittee must take the following actions when it violates or is unable to comply with any permit condition:

1. Immediately take action to stop, contain, and cleanup unauthorized discharges or otherwise stop the noncompliance and correct the problem.
2. If applicable, immediately repeat sampling and analysis. Submit the results of any repeat sampling to Ecology within 30 days of sampling.

a. Immediate reporting

The Permittee must **immediately** report to Ecology and the Department of Health, Shellfish Program (at the numbers listed below), for all:

- Failures of disinfection system
- Collection system overflows discharging to marine surface waters
- Plant bypasses discharging to marine surface waters

Southwest Region Office 360-407-6300

Department of Health 360-236-3330 (business hours)

Shellfish Programs 360-789-8962 (after hours)

b. Twenty-four (24) hour reporting

The Permittee must report the following occurrences of noncompliance by telephone, to Ecology at the telephone number listed above, within 24 hours from the time the Permittee becomes aware of any of the following circumstances:

- (i) Any noncompliance that may endanger health or the environment, unless previously reported under immediate reporting requirements.

- (ii) Any unanticipated bypass that causes an exceedance of any effluent limit in the permit (See Part S4.B., Bypass Procedures).
- (iii) Any upset that causes an exceedance of any effluent limit in the permit (See G15., Upset).
- (iv) Any violation of a maximum daily or instantaneous maximum discharge limit for any of the pollutants in Special Condition S1.A. of this permit.
- (v) Any overflow prior to the treatment works, whether or not such overflow endangers health or the environment or exceeds any effluent limit in the permit. This requirement does not include industrial process wastewater overflows to impermeable surfaces which are collected and routed to the treatment works.

c. Report within five days

The Permittee must also submit a written report within five days of the time that the Permittee becomes aware of any reportable event under subparts a or b, above. The report must contain:

- (i) A description of the noncompliance and its cause.
- (ii) The period of noncompliance, including exact dates and times.
- (iii) The estimated time the Permittee expects the noncompliance to continue if not yet corrected.
- (iv) Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance.
- (v) If the noncompliance involves an overflow prior to the treatment works, an estimate of the quantity (in gallons) of untreated overflow.

Submit the written report electronically using the Water Quality Permitting Portal – Permit Submittals application.

d. Waiver of written reports

Ecology may waive the written report required in subpart c, above, on a case-by-case basis upon request if the Permittee has submitted a timely oral report.

e. All other permit violation reporting

The Permittee must report all permit violations, which do not require immediate or within 24 hours reporting, when it submits monitoring reports for Special Condition S3.A. (Reporting). The reports must contain the information listed in subpart c, above. Compliance with these requirements does not relieve the Permittee from responsibility to maintain continuous compliance with the terms and conditions of this permit or the resulting liability for failure to comply.

S3.G. Other reporting

1. Spills of oil or hazardous materials

In addition to the requirements in S3.F, the Permittee must report a spill of oil or hazardous materials in accordance with the requirements of Revised Code of Washington (RCW) 90.56.280 and WAC 173-303-145. Visit the website [How to Report a Spill²](#) for further instructions.

2. Failure to submit relevant or correct facts

Where the Permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application, or in any report to Ecology, it must submit such facts or information promptly.

S3.H. Maintaining a copy of this permit

The Permittee must keep a copy of this permit at the facility and make it available upon request to Ecology inspectors.

S4. Operation and maintenance

The Permittee must, at all times, properly operate and maintain all facilities or systems of treatment and control (and related appurtenances), which are installed to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes keeping a daily operation logbook (paper or electronic), adequate laboratory controls, and appropriate quality assurance procedures. This provision of the permit requires the Permittee to operate backup or auxiliary facilities or similar systems only when the operation is necessary to achieve compliance with the conditions of this permit.

S4.A. Operation and Maintenance (O&M) Manual

1. O&M Manual submittal and requirements

The Permittee must:

- a. Prepare an O&M Manual to meet the requirements of WAC 173-240-150 and submit it to Ecology for approval **by 60-days after the completion of construction.**
- b. Submit to Ecology for review and approval substantial changes or updates to the O&M Manual.
- c. Keep the approved O&M Manual at the permitted facility.
- d. Follow the instructions and procedures of this manual.

2. Adaptive Management

² <https://ecology.wa.gov/About-us/Get-involved/Report-an-environmental-issue/Report-a-spill>

- a. In addition to the requirements of WAC 173-240-150, the O&M Manual, the permittee must have the adaptive management strategies that could be employed to adjust the pilot project's operations or monitoring based on results from ongoing monitoring efforts.
- b. Operations must be shut down immediately when water quality or biological issues being observed or recorded.

S4.B. Bypass procedures

A bypass is the intentional diversion of waste streams from any portion of a treatment facility. This permit prohibits all bypass except when the bypass is for essential maintenance, as authorized in Special Condition S4.B.1, or is approved by Ecology as an anticipated bypass following the procedures in Special Condition S4.B.2.

1. Bypass for essential maintenance without the potential to cause violation of permit limits or conditions.

This permit allows bypasses for essential maintenance of the treatment system when necessary to ensure efficient operation of the system. The Permittee may bypass the treatment system for essential maintenance only if doing so does not cause violations of effluent limits. The Permittee is not required to notify Ecology when bypassing for essential maintenance. However, the Permittee must comply with the monitoring requirements specified in Special Condition S2.B.

2. Anticipated bypass for non-essential maintenance.

Ecology may approve an anticipated bypass under the conditions listed below. This permit prohibits any anticipated bypass that is not approved through the following process.

- a. If a bypass is for non-essential maintenance, the Permittee must notify Ecology, if possible, at least 10 days before the planned date of bypass. The notice must contain:
 - A description of the bypass and the reason the bypass is necessary.
 - An analysis of all known alternatives which would eliminate, reduce, or mitigate the potential impacts from the proposed bypass.
 - A cost-effectiveness analysis of alternatives.
 - The minimum and maximum duration of bypass under each alternative.
 - A recommendation as to the preferred alternative for conducting the bypass.
 - The projected date of bypass initiation.
 - A statement of compliance with State Environmental Policy Act (SEPA).

- A request for modification of Water Quality Standards as provided in WAC 173-201A-410, if an exceedance of any Water Quality Standard is anticipated.
 - Details of the steps taken or planned to reduce, eliminate, and prevent recurrence of the bypass.
- b. For probable construction bypasses, the Permittee must notify Ecology of the need to bypass as early in the planning process as possible. The Permittee must consider the analysis required above during the project planning and design process. The project-specific engineering report as well as the plans and specifications must include details of probable construction bypasses to the extent practical. In cases where the Permittee determines the probable need to bypass early, the Permittee must continue to analyze conditions up to and including the construction period in an effort to minimize or eliminate the bypass.
- c. Ecology will determine if the Permittee has met the conditions of Special Condition S4.B.2.a and b, and consider the following prior to issuing a determination letter, an Administrative Order, or a permit modification as appropriate for an anticipated bypass:
- If the Permittee planned and scheduled the bypass to minimize adverse effects on the public and the environment.
 - If the bypass is unavoidable to prevent loss of life, personal injury, or severe property damage. "Severe property damage" means substantial physical damage to the property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
 - If feasible alternatives to the bypass exist, such as:
 - The use of auxiliary treatment facilities
 - Retention of untreated wastes
 - Stopping production
 - Maintenance during normal periods of equipment downtime, but not if the Permittee should have installed adequate backup equipment in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance.
 - Transport of untreated wastes to another treatment facility.

S5. Solid waste

S5.A. Solid waste handling

The Permittee must handle and dispose of all solid waste material in such a manner as to prevent its entry into state ground or surface water.

S5.B. Leachate

The Permittee must not allow leachate from its solid waste material to enter state waters without providing all known, available, and reasonable methods of treatment (AKART), nor allow such leachate to cause violation of State Surface Water Quality Standards, Chapter 173-201A WAC, or the State Ground Water Quality Standards, Chapter 173-200 WAC. The Permittee must apply for a permit or permit modification as may be required for such discharges to state ground or surface water.

S6. Non-routine and unanticipated Process Water

S6.A. Notification requirements

Beginning on the effective date of this permit, the Permittee is authorized to discharge non-routine wastewater or unanticipated wastewater not listed on the permit application on a case-by-case basis, if approved by Ecology. Prior to any such discharge, the Permittee must contact Ecology, and at a minimum, provide the following information:

1. The proposed discharge location;
2. The nature of the activity that will generate the discharge;
3. Any alternatives to the discharge, such as reuse, storage, or recycling of the water;
4. The total volume of water it expects to discharge;
5. The results of the chemical analysis of the water;
6. The date of proposed discharge; and
7. The expected rate of discharge discharged, in gallons per minute.

S6.B. Chemical analysis

The Permittee must analyze the water for constituents limited for the discharge and report them as required by subpart A.5 above. The analysis must also include any parameter deemed necessary by Ecology. All discharges must comply with the authorization and limits established in Special Condition S1 of this permit, Water Quality Standards, and any other limits imposed by Ecology.

S6.C. Flow limitation

The Permittee must limit the discharge rate, as referenced in subpart A.7 above, so it will not cause erosion of ditches or structural damage to culverts and their entrances or exits.

S6.D. Approval requirements

The discharge cannot proceed until Ecology has reviewed the information provided and has authorized the discharge by letter to the Permittee or by an Administrative Order. Once

approved, and if the proposed discharge to a municipal storm drain, the Permittee must obtain prior approval from the municipality and notify it when it plans to discharge.

S7. Spill Control Plan

S7.A. Spill Control Plan submittals and requirements

The Permittee must:

1. Submit to Ecology a Spill Control Plan by **March 3, 2025**.
Review the Plan at least annually and update the Spill Plan as needed.
2. Send changes to the Plan to Ecology.
3. Follow the Plan and any supplements throughout the term of the permit.

S7.B. Spill Control Plan components

The Spill Control Plan must include the following:

1. A list of all oil and petroleum products and other materials used and/or stored on-site, which when spilled, or otherwise released into the environment, designate as a Dangerous Waste (DW) or Extremely Hazardous Waste (EHW) by the procedures set forth in WAC 173-303-070. Include other materials used and/or stored on-site which may become pollutants or cause pollution upon reaching State's waters.
2. A description of preventive measures and facilities (including an overall facility plot showing drainage patterns) which prevent, contain, or treat spills of these materials.
3. A description of the reporting system, the Permittee will use to alert responsible managers and legal authorities in the event of a spill.
4. A description of operator training to implement the Plan.

The Permittee may submit plans and manuals required by 40 CFR Part 112, contingency plans required by Chapter 173-303 WAC, or other plans required by other agencies, which meet the intent of this section. Approval of the Spill Control Plan with respect to this requirement does not constitute approval of the plans and manuals with respect to the underlying requirement.

S8. Ecology Safety Methodology.

Project Macoma must conduct biological monitoring in accordance with the approved United States Army Corps of Engineers (USACE) Ecology Safety Methodology (ESM), in consultation with the United States Fish and Wildlife Services (USFWS), and the National Marine Fisheries Service [NMFS]). More details on the ESM (National Pollutant Discharge Elimination System Ecology Safety Methodology, Marine Carob Dioxide Removal Pilot Study, October 2024) are available on Ecology's website at the following link.

<https://apps.ecology.wa.gov/paris/DocumentSearch.aspx?PermitNumber=WA0991051&FacilityName=&City=&County=&Region=0&PermitType=0&DocumentType=0>

. Project Macoma must apply the following best management practices to mitigate any adverse impact on the receiving waterbody.

S8.A. Monitoring and Adaptive Management

1. Monitoring

Operation monitoring of pilot study effects must begin once project deployment occurs and would consist of water quality monitoring, biological monitoring, and sediment survey, as detailed in the following subsections.

a. Water Quality Monitoring

- i. Monitoring must be conducted at the locations identified under permit condition S2, and for the parameters specified under permit condition S2.
- ii. Water quality must be monitored during the release of each scenario to monitor and must meet the permit limits as described under permit condition S1.

b. Biological Monitoring

- i. Short-term and long-term biological monitoring must be conducted to inform an understanding of pilot project's effects using the ESM.
- ii. The measures outlined in the ESM must be taken to protect the ecosystem and preserve the beneficial uses of the Port Angeles Harbor.

c. Sediment Survey

- i. Conduct the baseline sediment survey at the locations shown in the ESM, Appendix B, figure, following the protocol discussed in the ESM, before the project begins.
- ii. Conduct first follow up sediment survey within 6 months after the start of enhanced alkaline/scientific operations.
- iii. Conduct a final follow up sediment survey within 60 days after the completion of the project.

2. Adaptive Management

The details on the adaptive management are provided on pages 6 and 7 of the ESM. This section of the ESM describes the adaptive management strategies that need to be employed to adjust the pilot project's operations or monitoring based on results from ongoing monitoring efforts. Operations must be shut down immediately when water quality or biological issues are observed or recorded, and adjustments made to mitigate adverse impacts before resuming the operation.

S9. Receiving water study

The Permittee must collect receiving water information necessary to determine if the effluent causes a violation of the Water Quality Criteria outside of the boundary of a mixing zone as result of the discharge. Additionally, the receiving water study shall provide supporting information to evaluate whether the discharge at the edge of the mixing zone does not have a reasonable potential to cause a loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses of the water body, result in damage to the ecosystem, or adversely affect public health as determined by the department.

The Permittee must:

1. Submit a Sampling and Quality Assurance Plan for Ecology review and approval **February 3, 2025**. Prepare all Quality Assurance Plans in accordance with the *Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies*, Publication 04-03-030 (Ecology, 2016).
2. Conduct all sampling and analysis in accordance with the approved Quality Assurance Project Plan.
3. Collect baseline data for water quality and biological data prior to the beginning of the operation.
4. Submit the baseline study report to Ecology by **May 5, 2025**.
5. Conduct water quality monitoring at the edge of chronic mixing zone boundary to comply with permit Condition S1 and S2.
6. Evaluate the impact of this discharge on the federally and state listed threatened/endangered species such as juvenile Chinook and Coho salmon that use the Elwha nearshore in the vicinity of this mixing zone as a migratory corridor. Additionally, the study should evaluate adult, juvenile, and larval forage fish, including surf smelt, sand lance, and herring that use this area for migration and surf smelt and sand lance that use the area in and around the Port Angeles harbor for spawning.

S10. Outfall evaluation

The Permittee must inspect, 1/permit cycle, the submerged portion of the outfall line and diffuser to document its integrity and continued function. If conditions allow for a photographic verification, the Permittee must include such verification in the report. By **December 5, 2025**, the Permittee must submit the inspection report to Ecology through the Water Quality Permitting Portal – Permit Submittals application. The Permittee must submit hard copies of any video files to Ecology as required by Permit Condition S3.B. The Portal does not support submittal of video files.

The inspector must, at a minimum:

1. Assess the physical condition of the outfall pipe, diffuser, and associated couplings.
2. Determine the extent of sediment accumulation in the vicinity of the diffuser.

3. Ensure diffuser ports are free of obstructions and are allowing uniform flow.
4. Confirm physical location (latitude/longitude) and depth (at MLLW) of the diffuser section of the outfall.
5. Assess physical condition of the submarine line any tethers or electric transmissions to submerged equipment.
6. Assess physical condition of anchors used to secure the submarine line if there are any.

S11. Marine carbon dioxide removal Intake Structure (mCDRIS)

Pursuant to Section 316(b) of the Clean Water Act, the Permittee must comply with the following requirements to minimize adverse impact by the facility's mCDRIS.

S11.A. Operation and Maintenance

The Permittee must:

1. At all times, properly operate and maintain the intake structure including any existing technologies currently used to minimize impingement and entrainment.
2. Report any significant impingement or entrainment events to Ecology within 24 hours consistent with the requirements in Permit Condition S3.F.b.
3. Notify Ecology 60 days prior to any changes which change the design through-screen velocity or location of the intake structure.
4. Perform visual impingement monitoring of the intake structure on a weekly basis. Include photographic verification if conditions allow. Document inspection dates, findings, and any maintenance performed. Records of inspections must be made available to Ecology upon request.
5. Include procedures for inspection, maintenance, and reporting for the mCDRIS as explained in the ESM, Permit Condition S8.

S11.B. Endangered Species Act

Nothing in this permit authorizes take for the purposes of a facility's compliance with the Endangered Species Act.

S12. Acute toxicity test

S12.A. Effluent limit for acute toxicity

The effluent limit for acute toxicity is:

No Acute toxicity detected in a test concentration representing the acute critical effluent concentration (ACEC).

The ACEC means the maximum concentration of effluent during critical conditions at the boundary of the acute mixing zone, defined in Permit condition S1.C. of the permit. The ACEC equals **1.14 percent effluent**.

S12.B. Compliance with the effluent limit for acute toxicity

Compliance with the effluent limit for acute toxicity means the results of the testing specified in Section C show no statistically significant difference in survival between the control and the ACEC.

If the test results show a statistically significant difference in survival between the control and the ACEC, and Ecology has not determined the test result to be anomalous under Section D, and the test is otherwise valid, the result is a violation of the effluent limit for acute toxicity. The Permittee must immediately conduct the additional testing described in Section D.

The Permittee must determine the statistical significance by conducting a hypothesis test at the 0.05 level of significance (Appendix H, EPA/600/4-89/001). If the difference in survival between the control and the ACEC is less than 10%, the Permittee must conduct the hypothesis test at the 0.01 level of significance.

S12.C. Compliance testing for acute toxicity

The Permittee must:

1. Perform the acute toxicity tests with 100 percent effluent, the ACEC, and a control, or with a full dilution series.
2. Conduct acute toxicity testing on the final effluent once per each species. This acute toxicity test must be conducted during the first year of the pilot project, before scientific operations begin.
3. Submit a written report to Ecology within 45 days of sampling. The Permittee must submit the report no later than one year from the start of the project. Further instructions on testing conditions and test report content are in Section E below.
4. The Permittee must perform compliance tests using each of the species and protocols listed below on a rotating basis:

Table 15 – Acute Toxicity Test

Acute Toxicity Test	Species	Method
Topsmelt, 96-Hour Static Renewal Test	<i>Atherinops affinis</i>	WDOE WQ-R-95-80 EPA-821-R-02-012
Mysid, 48-Hour Static test	<i>Americamysis bahia</i> (formerly <i>Mysidopsis bahia</i>)	EPA-821-R-02-012

S12.D. Response to noncompliance with the effluent limit for acute toxicity

If a toxicity test conducted under Section C determines a statistically significant difference in response between the ACEC and the control, using the statistical test described in Section B,

the Permittee must begin additional testing within one week from the time of receiving the test results. The Permittee must:

1. Test the next four discharge events using the same test and species as the failed compliance test.
2. Test at least five effluent concentrations and as control to determine appropriate point estimates. One of these effluent concentrations must equal the ACEC. The results of the test at the ACEC will determine compliance with the effluent limit for acute toxicity as described in Section B.
3. Return to the original monitoring frequency in Section C after completion of the additional compliance monitoring.

Anomalous test results: If a toxicity test conducted under Section C indicates noncompliance with the acute toxicity limit and the Permittee believes that the test result is anomalous, the Permittee may notify Ecology that the compliance test result may be anomalous. The Permittee may take one additional sample for toxicity testing and wait for notification from Ecology before completing the additional testing. The Permittee must submit the notification with the report of the compliance test result and identify the reason for considering the compliance test result to be anomalous.

If Ecology determines that the test result was not anomalous, the Permittee must complete all the additional monitoring required in this section; or

If the one additional sample fails to comply with the effluent limit for acute toxicity, then the Permittee must complete all the additional monitoring required in this section; or

If Ecology determines that the test result was anomalous, the one additional test result will replace the anomalous test result for the purpose of determining compliance with the acute toxicity limit.

If all the additional testing complies with the permit limit, the Permittee must submit a report to Ecology on possible causes and preventive measures for the transient toxicity event, which triggered the additional compliance monitoring.

This report must include a search of all pertinent and recent facility recordings, including:

- Operating records
- Monitoring results
- Inspection records
- Spill reports
- Weather records

- Production records
- Raw material purchases
- Pretreatment records, etc.

If additional testing in this section shows another violation of the acute toxicity limit, the Permittee must submit a Toxicity Identification/Reduction Evaluation (TI/RE) Plan to Ecology within 60 days after the sample date [WAC 173-205-100(2)].

S12.E. Sampling and reporting requirements

1. The Permittee must submit all reports for toxicity testing in accordance with the *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*, Publication 95-80 (Ecology, 2016). Reports must contain toxicity data, bench sheets, and reference toxicant results for test methods. In addition, the Permittee must submit toxicity test data in electronic format (CETIS export file preferred) for entry into Ecology's database.
2. The Permittee must collect **grab samples** for toxicity testing. The Permittee must cool the samples to 0 – 6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.
3. The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing, as specified in the *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*, Publication WQ-R-95-80 (Ecology, 2016).
4. All toxicity tests must meet quality assurance criteria and test conditions specified in the EPA methods listed in Subsection C and the *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*, Publication WQ-R-95-80 (Ecology, 2016). If Ecology determines any test results to be invalid or anomalous, the Permittee must repeat the testing with freshly collected effluent.
5. The laboratory may use dilution water that is uncontaminated 1-µm filtered natural seawater hypersaline brine prepared from uncontaminated natural seawater plus reagent water. Natural seawater may be uncontaminated receiving water. This water is used in all dilution steps and as the control water.
6. The Permittee must conduct Whole Effluent Toxicity tests on an unmodified sample of final effluent.
7. The Permittee may choose to conduct a full dilution series test during compliance testing in the order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control. The series of concentrations must include the ACEC. The ACEC equals 0.83 percent effluent.

8. All Whole Effluent Toxicity tests, effluent screening tests, and rapid screening tests that involve hypothesis testing must comply with the acute statistical power standard of 29 percent as defined in WAC 173-205-020. If the test does not meet the power standard, the Permittee must repeat the test on a fresh sample with an increased number of replicates to increase the power.

S13. Project results report

The permittee is required to submit the project results report **60 days after completion of the pilot project**. This report should include a calculation of carbon sequestration and its benefits compared to water intake and discharge.

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- Ecology. (2004). *Information Manual for Treatment Plant Operators, Publication 04-10-020*. Retrieved from <https://apps.ecology.wa.gov/publications/SummaryPages/0410020.html>
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https://pubs.usgs.gov/twri/twri3-a12/pdf/TWRI_3-A12.pdf

GENERAL CONDITIONS

G1. SIGNATORY REQUIREMENTS

1. All applications submitted to Ecology must be signed and certified.
 - a. In the case of corporations, by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
 - A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or
 - The manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing the other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - b. In the case of a partnership, by a general partner.
 - c. In the case of sole proprietorship, by the proprietor.
 - d. In the case of municipal, state, or other public facility, by either a principal executive officer or ranking elected official.

Applications for permit for domestic wastewater facilities that are either owned or operated by, or under contract to, a public entity shall be submitted by the public entity.

2. All reports required by this permit and other information requested by Ecology must be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - a. The authorization is made in writing by a person described above and submitted to Ecology.
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to authorization. If an authorization under paragraph G1.2., above, is no longer accurate because a different individual or position has responsibility for overall operation of the facility, a new authorization satisfying the requirements of paragraph G1.2., above, must be submitted to Ecology prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification. Any person signing a document under this section must make the following certification:

"I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

G2. RIGHT OF INSPECTION AND ENTRY

The Permittee must allow an authorized representative of Ecology, upon the presentation of credentials and such other documents as may be required by law:

1. To enter upon the premises where a discharge is located or where any records must be kept under the terms and conditions of this permit.
2. To have access to and copy, at reasonable times and a reasonable cost, any records required to be kept under the terms and conditions of this permit.
3. To inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required under this permit.
4. To sample or monitor, at reasonable times, any substances or parameters at any location for purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act.

G3. PERMIT ACTIONS

This permit may be modified, revoked and reissued, or terminated either at the request of any interested person (including the Permittee) or upon Ecology's initiative. However, the permit may only be modified, revoked and reissued, or terminated for the reasons specified in 40 CFR Part 122.62, 40 CFR Part 122.64, or WAC 173-220-150 according to the procedures of 40 CFR Part 124.5.

1. The following are causes for terminating this permit during its term, or for denying a permit renewal application:
 - a. Violation of any permit term or condition.
 - b. Obtaining a permit by misrepresentation or failure to disclose all relevant facts.

- c. A material change in quantity or type of waste disposal.
 - d. Determination that the permitted activity endangers human health or the environment, or contributes to Water Quality Standards violations and can only be regulated to acceptable levels by modification or termination.
 - e. A change in any condition requires either a temporary or permanent reduction, or elimination of any discharge or sludge use or disposal practice controlled by the permit.
 - f. Nonpayment of fees assessed pursuant to RCW 90.48.465.
 - g. Failure or refusal of the Permittee to allow entry as required in RCW 90.48.090.
2. The following are causes for modification but not revocation and reissuance except when the Permittee requests or agrees:
- a. A material change in the condition of waters of the State.
 - b. New information not available at the time of permit issuance that would have justified the application of different permit conditions.
 - c. Material and substantial alterations or additions to the permitted facility or activities which occurred after this permit issuance.
 - d. Promulgation of new or amended standards or regulations having a direct bearing upon permit conditions, or requiring permit revision.
 - e. The Permittee has requested a modification based on other rationale meeting the criteria of 40 CFR Part 122.62.
 - f. Ecology has determined that good cause exists for modification of a compliance schedule, and the modification will not violate statutory deadlines.
 - g. Incorporation of an approved local pretreatment program into a municipality's permit.
3. The following are causes for modification or alternatively revocation and reissuance:
- a. The permitted facility being determined to be a new source pursuant to 40 CFR Part 122.29(b).
 - b. A significant change in the nature or an increase in quantity of pollutants discharged.
 - c. A significant change in the Permittee's sludge use or disposal practices. Following such notice, and the submittal of a new application or supplement to the existing application, along with required Engineering Plans and Reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR Part 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, any new or increased discharge in excess of permit limits or not specifically authorized by the permit constitutes a violation.

G4. REPORTING PLANNED CHANGES

The Permittee must, as soon as possible, but no later than 180 days prior to the proposed changes, give notice to Ecology of planned physical alterations or additions to the permitted facility, production increases, or process modification which will result in:

1. The permitted facility being determined to be a new source pursuant to 40 CFR 122.29(b).
2. A significant change in the nature or an increase in quantity of pollutants discharged.
3. A significant change in the Permittee's sludge use or disposal practices. Following such notice, and the submittal of new application or supplement to the existing application, along with required Engineering Plans and Reports, this permit may be modified, or revoked and reissued pursuant to 40 CFR 122.62(a) to specify and limit any pollutants not previously limited. Until such modification is effective, a new or increased discharge in excess of permit limits or not specifically authorized by this permit constitutes a violation.

G5. PLAN REVIEW REQUIRED

Prior to constructing or modifying any wastewater control facilities, an Engineering Report and detailed Plans and Specifications must be submitted to Ecology for approval in accordance with Chapter 173-240 WAC. Engineering Reports, Plans, and Specifications must be submitted at least 180 days prior to the planned start of construction unless a shorter time is approved by Ecology. Facilities must be constructed and operated in accordance with the approval plans.

G6. COMPLIANCE WITH OTHER LAWS AND STATUTES

Nothing in this permit excuses the Permittee from compliance with any applicable federal, state, or local statutes ordinances, or regulations.

G7. TRANSFER OF THIS PERMIT

In the event of any change in control or ownership of facilities from which the authorized discharge emanate, the Permittee must notify the succeeding owner or controller of the existence of this permit by letter, a copy of which must be forwarded to Ecology.

1. Transfer by Modification

Except as provided in paragraph B below, this permit may be transferred by the Permittee to a new owner or operator only if this permit has been modified or revoked and reissued under 40 CFR Part 122.62(b)(2), or a minor modification made under 40 CFR Part 122.63(d), to identify the new Permittee and incorporate such other requirements as may be necessary under the Clean Water Act.

2. Automatic Transfers

This permit may be automatically transferred to a new Permittee if:

- a. The Permittee notifies Ecology at least 30 days in advance of the proposed transfer date.
- b. The notice includes a written agreement between the existing and new Permittees containing a specific date transfer of permit responsibility, coverage, and liability between them.

- c. Ecology does not notify the existing Permittee and the proposed new Permittee or its intent to modify or revoke and reissue this permit. A modification under this subparagraph may also be minor modification under 40 CFR Part 122.63. If this notice is not received, the transfer is effective on the date specified in the written agreement.

G8. REDUCED PRODUCTION FOR COMPLIANCE

The Permittee, in order to maintain compliance with its permit, must control production and/or all discharges upon reduction, loss, failure, or bypass of the treatment facility until the facility is restored or an alternative method of treatment is provided. This requirement applies in the situation where, among other things, the primary source of power of the treatment facility is reduced, lost, or fails.

G9. REMOVED SUBSTANCES

Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must not be re-suspended or reintroduced to the final effluent stream for discharge to state waters.

G10. DUTY TO PROVIDE INFORMATION

The Permittee must submit to Ecology within a reasonable time, all information which Ecology may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The Permittee must also submit to Ecology, upon request, copies of records required to be kept by this permit.

G11. OTHER REQUIREMENTS OF 40 CFR

The other requirements of 40 CFR Part 122.41 and 40 CFR Part 122.42 are incorporated in this permit by reference.

G12. ADDITIONAL MONITORING

Ecology may establish specific monitoring requirements in addition to those contained in this permit by Administrative Order or permit modification.

G13. PAYMENT OF FEES

The Permittee must submit payment of fees associated with this permit as assessed by Ecology.

G14. PENALTIES FOR VIOLATION OF PERMIT CONDITIONS

Any person who is found guilty of willfully violating the terms and conditions of this permit is deemed guilty of a crime, and upon conviction thereof, shall be punished by a fine up to \$10,000 and costs of prosecution, or by imprisonment in the discretion of the court. Each day upon which a willful violation occurs may be deemed a separate and additional violation.

Any person who violates the terms and conditions of a waste discharge permit may incur, in addition to any other penalty as provided by law, a civil penalty in the amount of up to \$10,000 for each such violation. Each and every such violation is a separate and distinct offense, and in

case of a continuing violation, every day's continuance is deemed to be a separate and distinct violation.

G15. UPSET

Definition – "Upset" means an exception incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limits because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limits if the requirements of the following paragraph are met.

A Permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

1. An upset occurred and that the Permittee can identify the cause(s) of the upset.
2. The permitted facility was being properly operated at the time of the upset.
3. The Permittee submitted notice of the upset as required in Special Condition S3.F.
4. The Permittee complied with any remedial measures required under Special Condition S3.F. of this permit.

If any enforcement action the Permittee seeking to establish the occurrence of an upset has the burden of proof.

G16. PROPERTY RIGHTS

This permit does not convey any property rights of any sort, or any exclusive privilege.

G17. DUTY TO COMPLY

The Permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is ground for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal.

G18. TOXIC POLLUTANTS

The Permittee must comply with effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if this permit has not yet been modified to incorporate the requirement.

G19. PENALTIES FOR TAMPERING

The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this condition,

punishment shall be a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than four years, or by both.

G20. REPORTING REQUIREMENTS APPLICABLE TO EXISTING MANUFACTURING, COMMERCIAL, MINING, AND SILVICULTURAL DISCHARGES

The Permittee belonging to the categories of existing manufacturing, commercial, Mining, or silviculture must notify Ecology as soon as they know or have reason to believe:

1. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels:"
 - a. One hundred micrograms per liter (100 µg/L)
 - b. Two hundred micrograms per liter (200 µg/L) for Acrolein and Acrylonitrile; 500 µg/L for 2,4-Dinitrophenol and 2-Methyl-4,6-Dinitrophenol; and 1 mg/L for Antimony.
 - c. Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR Part 122.21(g)(7).
 - d. The level established by the Director in accordance with 40 CFR Part 122.44 (f).
2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in this permit, if that discharge will exceed the highest of the following "notification levels:"
 - a. Five hundred (500) µg/L
 - b. One (1) mg/L for Antimony
 - c. Ten times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR Part 122.21(g)(7).
 - d. The level established by the Director in accordance with 40 CFR Part 122.44(f).

G21. COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date.

APPENDIX A – List of Pollutants, Analytical Methods, Detection Levels and Quantitation Levels

The Permittee must use the specified analytical methods, detection levels (DLs) ¹ and quantitation levels (QLs) ² in the following table for permit and application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136.

If the Permittee uses an alternative method, not specified in the permit, and as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

If the Permittee is unable to obtain the required DL and QL in its effluent due to matrix effects, the Permittee must submit a matrix-specific detection level (MDL) and a quantitation level (QL) to Ecology with appropriate laboratory documentation when the detection levels are too high to provide results near or below criteria (or applicable permit limits).

The lists below include conventional pollutants (as defined in CWA section 502(6) and 40 CFR Part 122), toxic or priority pollutants as defined in CWA section 307(a)(1) and listed in 40 CFR Part 122 Appendix D, 40 CFR Part 401.15 and 40 CFR Part 423 Appendix A), and nonconventionals. 40 CFR Part 122 Appendix D (Table V) also identifies toxic pollutants and hazardous substances which are required to be reported by dischargers if expected to be present. This permit appendix A list does not include those parameters.

Appendix A Table 1 – Conventional pollutants

Pollutant	CAS number (if available)	Recommended analytical protocol	Detection level (DL) ¹ µg/L unless specified	Quantitation level (QL) ² µg/L unless specified
Biochemical Oxygen Demand		SM5210-B		2 mg/L
Biochemical Oxygen Demand, Soluble		SM5210-B ³		2 mg/L
Fecal Coliform		SM 9221E, 9221F SM 9222D	N/A	Specified in method sample aliquot dependent

Oil and Grease (HEM) (Hexane Extractable Material)		1664 A or B	1,400	5,000
pH		SM4500-H+ B	N/A	N/A
Total Suspended Solids		SM2540-D		5 mg/L

Appendix A Table 2 - Nonconventional pollutants

Pollutant	CAS number (if available)	Recommended analytical protocol	Detection level (DL) ¹ µg/L unless specified	Quantitation level (QL) ² µg/L unless specified
Alkalinity, Total		SM2320-B		5 mg/L as CaCO ₃
Aluminum, Total	7429-90-5	200.8	2.0	10
Ammonia, Total (as N)		SM4500-NH3-B and C/D/E/G/H		20
Barium Total	7440-39-3	200.8	0.5	2.0
BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes)		EPA SW 846 8021/8260	1	2
Boron, Total	7440-42-8	200.8	2.0	10.0
Chemical Oxygen Demand		SM5220-D		10 mg/L
Chloride		SM4500-Cl B/C/D/E and SM4110 B		Sample and limit dependent
Chlorine, Total Residual		SM4500 Cl G	10	50
Cobalt, Total	7440-48-4	200.8	0.05	0.25
Color		SM2120 B/C/E		10 color units
Dissolved oxygen		SM4500-OC/OG		0.2 mg/L
E.coli		SM 9221B, 9221F, 9223B	N/A	Specified in method; sample aliquot dependent

Enterococci		EPA 1600 SM 9230B, 9230C, 9230D,	N/A	Specified in method; sample aliquot dependent
Flow		Calibrated device		
Fluoride	16984-48-8	SM4500-F E	25	100
Hardness, Total		SM2340B		200 as CaCO ₃
Iron, Total	7439-89-6	200.7	12.5	50
Magnesium, Total	7439-95-4	200.7	10	50
Manganese, Total	7439-96-5	200.8	0.1	0.5
Molybdenum, Total	7439-98-7	200.8	0.1	0.5
Nitrate + Nitrite Nitrogen (as N)		SM4500-NO ₃ - E/F/H		100
Nitrogen, Total Kjeldahl (as N)		SM4500-N _{org} B/C and SM4500NH ₃ - B/C/D/EF/G/H		300
NWTPH Dx ⁴		Ecology NWTPH Dx	250	250
NWTPH Gx ⁵		Ecology NWTPH Gx	250	250
Phosphorus, Total (as P)		SM 4500 PB followed by SM4500-PE/PF	3	10
Salinity		SM2520-B		3 practical salinity units or scale (PSU or PSS)
Settleable Solids		SM2540 -F		Sample and limit dependent
Soluble Reactive Phosphorus (as P)		SM4500-P E/F/G	3	10
Sulfate (as mg/L SO ₄)		SM4110-B		0.2 mg/L
Sulfide (as mg/L S)		SM4500-S2F/D/G		0.2 mg/L
Sulfite (as mg/L SO ₃)		SM4500-SO3B		2 mg/L

Temperature		Analog recorder or micro-recording devices (thermistors)		0.2°C
Tin, Total	7440-31-5	200.8	0.3	1.5
Titanium, Total	7440-32-6	200.8	0.5	2.5
Total Coliform		SM 9221B SM 9222B	N/A	Specified in method; sample aliquot dependent
Total Organic Carbon		SM5310-B/C/D		1 mg/L
Total Dissolved solids		SM2540 C		20 mg/L

Appendix A Table 3 - Priority pollutants: Metals, chromium (hex), cyanide & total phenols

Priority pollutants	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) ¹ µg/L unless specified	Quantitation level (QL) ² µg/L unless specified
Antimony, Total	114	7440-36-0	200.8	0.3	1.0
Arsenic, Total	115	7440-38-2	200.8	0.1	0.5
Beryllium, Total	117	7440-41-7	200.8	0.1	0.5
Cadmium, Total	118	7440-43-9	200.8	0.05	0.25
Chromium (hex) dissolved	119	18540-29-9	SM3500-Cr C	0.3	1.2
Chromium, Total	119	7440-47-3	200.8	0.2	1.0
Copper, Total	120	7440-50-8	200.8	0.4	2.0
Lead, Total	122	7439-92-1	200.8	0.1	0.5
Mercury, Total	123	7439-97-6	1631E	0.0002	0.0005
Nickel, Total	124	7440-02-0	200.8	0.1	0.5
Selenium, Total	125	7782-49-2	200.8	1.0	1.0
Silver, Total	126	7440-22-4	200.8	0.04	0.2

Thallium, Total	127	7440-28-0	200.8	0.09	0.36
Zinc, Total	128	7440-66-6	200.8	0.5	2.5
Cyanide, Total	121	57-12-5	335.4	5	10
Cyanide, Weak Acid Dissociable	121		SM4500-CN I	5	10
Cyanide, Free Amenable to Chlorination (Available Cyanide)	121		SM4500-CN G	5	10
Phenols, Total	65		EPA 420.1		50

Appendix A Table 4 - Priority pollutants: Acid compounds

Priority pollutants	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) ¹ µg/L unless specified	Quantitation level (QL) ² µg/L unless specified
2-Chlorophenol	24	95-57-8	625.1	3.3	9.9
2,4-Dichlorophenol	31	120-83-2	625.1	2.7	8.1
2,4-Dimethylphenol	34	105-67-9	625.1	2.7	8.1
4,6-dinitro-o-cresol (2-methyl-4,6,- dinitrophenol)	60	534-52-1	625.1/1625B	24	72
2,4 dinitrophenol	59	51-28-5	625.1	42	126
2-Nitrophenol	57	88-75-5	625.1	3.6	10.8
4-Nitrophenol	58	100-02-7	625.1	2.4	7.2
Parachlorometa cresol (4-chloro-3- methylphenol)	22	59-50-7	625.1	3.0	9.0
Pentachlorophenol	64	87-86-5	625.1	3.6	10.8
Phenol	65	108-95-2	625.1	1.5	4.5
2,4,6-Trichlorophenol	21	88-06-2	625.1	2.7	8.1

Appendix A Table 5 - Priority pollutants: Volatile compounds

Priority pollutants	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) ¹ µg/L unless specified	Quantitation level (QL) ² µg/L unless specified
Acrolein	2	107-02-8	624.1	5	10
Acrylonitrile	3	107-13-1	624.1	1.0	2.0
Benzene	4	71-43-2	624.1	4.4	13.2
Bromoform	47	75-25-2	624.1	4.7	14.1
Carbon tetrachloride	6	56-23-5	624.1/601 or SM6230B	2.8	8.4
Chlorobenzene	7	108-90-7	624.1	6.0	18.0
Chloroethane	16	75-00-3	624/601	1.0	2.0
2-Chloroethylvinyl Ether	19	110-75-8	624.1	1.0	2.0
Chloroform	23	67-66-3	624.1 or SM6210B	1.6	4.8
Dibromochloromethane (chlordibromomethane)	51	124-48-1	624.1	3.1	9.3
1,2-Dichlorobenzene	25	95-50-1	624.1	1.9	7.6
1,3-Dichlorobenzene	26	541-73-1	624.1	1.9	7.6
1,4-Dichlorobenzene	27	106-46-7	624.1	4.4	17.6
Dichlorobromomethane	48	75-27-4	624.1	2.2	6.6
1,1-Dichloroethane	13	75-34-3	624.1	4.7	14.1
1,2-Dichloroethane	10	107-06-2	624.1	2.8	8.4
1,1-Dichloroethylene	29	75-35-4	624.1	2.8	8.4
1,2-Dichloropropane	32	78-87-5	624.1	6.0	18.0
1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene)6	33	542-75-6	624.1	5.0	15.0
Ethylbenzene	38	100-41-4	624.1	7.2	21.6
Methyl bromide (Bromomethane)	46	74-83-9	624/601	5.0	10.0

Methyl chloride (Chloromethane)	45	74-87-3	624.1	1.0	2.0
Methylene chloride	44	75-09-2	624.1	2.8	8.4
1,1,2,2-Tetrachloroethane	15	79-34-5	624.1	6.9	20.7
Tetrachloroethylene	85	127-18-4	624.1	4.1	12.3
Toluene	86	108-88-3	624.1	6.0	18.0
1,2-Trans-Dichloroethylene (Ethylene dichloride)	30	156-60-5	624.1	1.6	4.8
1,1,1-Trichloroethane	11	71-55-6	624.1	3.8	11.4
1,1,2-Trichloroethane	14	79-00-5	624.1	5.0	15.0
Trichloroethylene	87	79-01-6	624.1	1.9	5.7
Vinyl chloride	88	75-01-4	624/SM6200B	1.0	2.0

Appendix A Table 6 - Priority pollutants: Base/neutral compounds

Priority pollutants	PP #	CAS number (if available)	Recommended analytical Protocol	Detection level (DL) ¹ µg/L unless specified	Quantitation level (QL) ² µg/L unless specified
Acenaphthene	1	83-32-9	625.1	1.9	5.7
Acenaphthylene	77	208-96-8	625.1	3.5	10.5
Anthracene	78	120-12-7	625.1	1.9	5.7
Benzidine	5	92-87-5	625.1	44	132
Benzyl butyl phthalate	67	85-68-7	625.1	2.5	7.5
Benzo(a)anthracene	72	56-55-3	625.1	7.8	23.4
Benzo(b)fluoranthene (3,4- benzofluoranthene) ⁷	74	205-99-2	610/625.1	4.8	14.4
Benzo(k)fluoranthene (11,12- benzofluoranthene) ⁷	75	207-08-9	610/625.1	2.5	7.5
Benzo(a)pyrene	73	50-32-8	610/625.1	2.5	7.5

Benzo(ghi)Perylene	79	191-24-2	610/625.1	4.1	12.3
Bis(2-chloroethoxy)methane	43	111-91-1	625.1	5.3	15.9
Bis(2-chloroethyl)ether	18	111-44-4	611/625.1	5.7	17.1
Bis(2-chloro-1-methylethyl)Ether (Bis(2-chloroisopropyl)ether) ⁸	42	108-60-1	625.1	5.7	17.1
Bis(2-ethylhexyl)phthalate	66	117-81-7	625.1	2.5	7.5
4-Bromophenyl phenyl ether	41	101-55-3	625.1	1.9	5.7
2-Chloronaphthalene	20	91-58-7	625.1	1.9	5.7
4-Chlorophenyl phenyl ether	40	7005-72-3	625.1	4.2	12.6
Chrysene	76	218-01-9	610/625.1	2.5	7.5
Dibenzo(a-h)anthracene (1,2,5,6- dibenzanthracene)	82	53-70-3	625.1	2.5	7.5
3,3-Dichlorobenzidine	28	91-94-1	605/625.1	16.5	49.5
Diethyl phthalate	70	84-66-2	625.1	1.9	5.7
Dimethyl phthalate	71	131-11-3	625.1	1.6	4.8
Di-n-butyl phthalate	68	84-74-2	625.1	2.5	7.5
2,4-dinitrotoluene	35	121-14-2	609/625.1	5.7	17.1
2,6-dinitrotoluene	36	606-20-2	609/625.1	1.9	5.7
Di-n-octyl phthalate	69	117-84-0	625.1	2.5	7.5
1,2-Diphenylhydrazine (as Azobenzene)	37	122-66-7	1625B/625.1	5.0	20
Fluoranthene	39	206-44-0	625.1	2.2	6.6
Fluorene	80	86-73-7	625.1	1.9	5.7
Hexachlorobenzene	9	118-74-1	612/625.1	1.9	5.7
Hexachlorobutadiene	52	87-68-3	625.1	0.9	2.7
Hexachlorocyclopentadiene	53	77-47-4	1625B/625.1	2.0	4.0
Hexachloroethane	12	67-72-1	625.1	1.6	4.8

Indeno(1,2,3-cd)Pyrene	83	193-39-5	610/625.1	3.7	11.1
Isophorone	54	78-59-1	625.1	2.2	6.6
Naphthalene	55	91-20-3	625.1	1.6	4.8
Nitrobenzene	56	98-95-3	625.1	1.9	5.7
N-Nitrosodimethylamine	61	62-75-9	607/625.1	2.0	4.0
N-Nitrosodi-n-propylamine	63	621-64-7	607/625.1	0.5	1.0
N-Nitrosodiphenylamine	62	86-30-6	625.1	1.0	2.0
Phenanthrene	81	85-01-8	625.1	5.4	16.2
Pyrene	84	129-00-0	625.1	1.9	5.7
1,2,4-Trichlorobenzene	8	120-82-1	625.1	1.9	5.7

Appendix A Table 7 - Dioxin

Priority pollutant	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) ¹ µg/L unless specified	Quantitation level (QL) ² µg/L unless specified
2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (2,3,7,8 TCDD)	129	1746-01-6	1613B	1.3 pg/L	5 pg/L

Appendix A Table 8 - Pesticides and PCBs

Priority pollutants	PP #	CAS number (if available)	Recommended analytical protocol	Detection level (DL) ¹ µg/L unless specified	Quantitation level (QL) ² µg/L unless specified
Aldrin	89	309-00-2	608.3	4.0 ng/L	12 ng/L
alpha-BHC	102	319-84-6	608.3	3.0 ng/L	9.0 ng/L
beta-BHC	103	319-85-7	608.3	6.0 ng/L	18 ng/L
gamma-BHC (Lindane)	104	58-89-9	608.3	4.0 ng/L	12 ng/L
delta-BHC	105	319-86-8	608.3	9.0 ng/L	27 ng/L

Chlordane ⁹	91	57-74-9	608.3	14 ng/L	42 ng/L
4,4'-DDT	92	50-29-3	608.3	12 ng/L	36 ng/L
4,4'-DDE	93	72-55-9	608.3	4.0 ng/L	12 ng/L
4,4' DDD	94	72-54-8	608.3	11ng/L	33 ng/L
Dieldrin	90	60-57-1	608.3	2.0 ng/L	6.0 ng/L
alpha-Endosulfan	95	959-98-8	608.3	14 ng/L	42 ng/L
beta-Endosulfan	96	33213-65-9	608.3	4.0 ng/L	12 ng/L
Endosulfan Sulfate	97	1031-07-8	608.3	66 ng/L	198 ng/L
Endrin	98	72-20-8	608.3	6.0 ng/L	18 ng/L
Endrin Aldehyde	99	7421-93-4	608.3	23 ng/L	70 ng/L
Heptachlor	100	76-44-8	608.3	3.0 ng/L	9.0 ng/L
Heptachlor Epoxide	101	1024-57-3	608.3	83 ng/L	249 ng/L
PCB-1242 ¹⁰	106	53469-21-9	608.3	0.065	0.195
PCB-1254	107	11097-69-1	608.3	0.065	0.195
PCB-1221	108	11104-28-2	608.3	0.065	0.195
PCB-1232	109	11141-16-5	608.3	0.065	0.195
PCB-1248	110	12672-29-6	608.3	0.065	0.195
PCB-1260	111	11096-82-5	608.3	0.065	0.195
PCB-1016 ¹⁰	112	12674-11-2	608.3	0.065	0.195
Toxaphene	113	8001-35-2	608.3	240 ng/L	720 ng/L

Footnotes

¹ Detection level (DL) – or method detection limit means the minimum concentration of an analyte (substance) that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results as determined by the procedure given in 40 CFR part 136, Appendix B.

² Quantitation Level (QL) – also known as Minimum Level (ML) – The term “minimum level” refers to either the sample concentration equivalent to the lowest calibration point in a method or a multiple of the method detection limit (DL), whichever is

higher. Minimum levels may be obtained in several ways: They may be published in a method; they may be based on the lowest acceptable calibration point used by a laboratory; or they may be calculated by multiplying the DL in a method, or the DL determined by a laboratory, by a factor of 3. For the purposes of NPDES compliance monitoring, EPA considers the following terms to be synonymous: “quantitation limit,” “reporting limit,” and “minimum level”.

³ Soluble Biochemical Oxygen Demand – method note: First, filter the sample through a Millipore Nylon filter (or equivalent) - pore size of 0.45-0.50 um (prep all filters by filtering 250 ml of laboratory grade deionized water through the filter and discard). Then, analyze sample as per method 5210-B.

⁴ Northwest Total Petroleum Hydrocarbons Diesel Extended Range OR NWTPH Dx – Analytical Methods for Petroleum Hydrocarbons <https://apps.ecology.wa.gov/publications/documents/97602.pdf>

⁵ Northwest Total Petroleum Hydrocarbons Gasoline Extended Range OR NWTPH Gx – Analytical Methods for Petroleum Hydrocarbons <https://apps.ecology.wa.gov/publications/documents/97602.pdf>

⁶ 1, 3-dichloropropylene (mixed isomers) – You may report this parameter as two separate parameters: cis-1, 3-dichloropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).

⁷ Total Benzo(a)fluoranthenes – Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzo(a)fluoranthenes.

⁸ Bis(2-Chloro-1-Methylethyl) Ether – This compound was previously listed as Bis(2-Chloroisopropyl) Ether (39638-32-9)

⁹ Chlordane – You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 14/42 ng/L.

¹⁰ PCB 1016 & PCB 1242 – You may report these two PCB compounds as one parameter called PCB 1016/1242.

¹¹ Prior to approval of analytical methods for PFAS chemicals under 40 CFR 136, the permittee must use the latest revision of EPA Method 1633. After analytical methods for PFAS chemicals are approved under 40 CFR 136, the permittee may use any sufficiently sensitive approved analytical method. If a laboratory that can analyze PFAS chemicals via Method 1633 is not reasonably available, the permittee may request use of an alternate method and Ecology can approve the alternative method by email.