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Lutak Inlet, Log Transfer Facility

AKG-701731

WATER WAY: Lutak Inlet LAS 35438 POA-2024-00622

Storm Water Pollution and Prevention Plan

Best Management Practices for Bark Debris Reduction

August 2025

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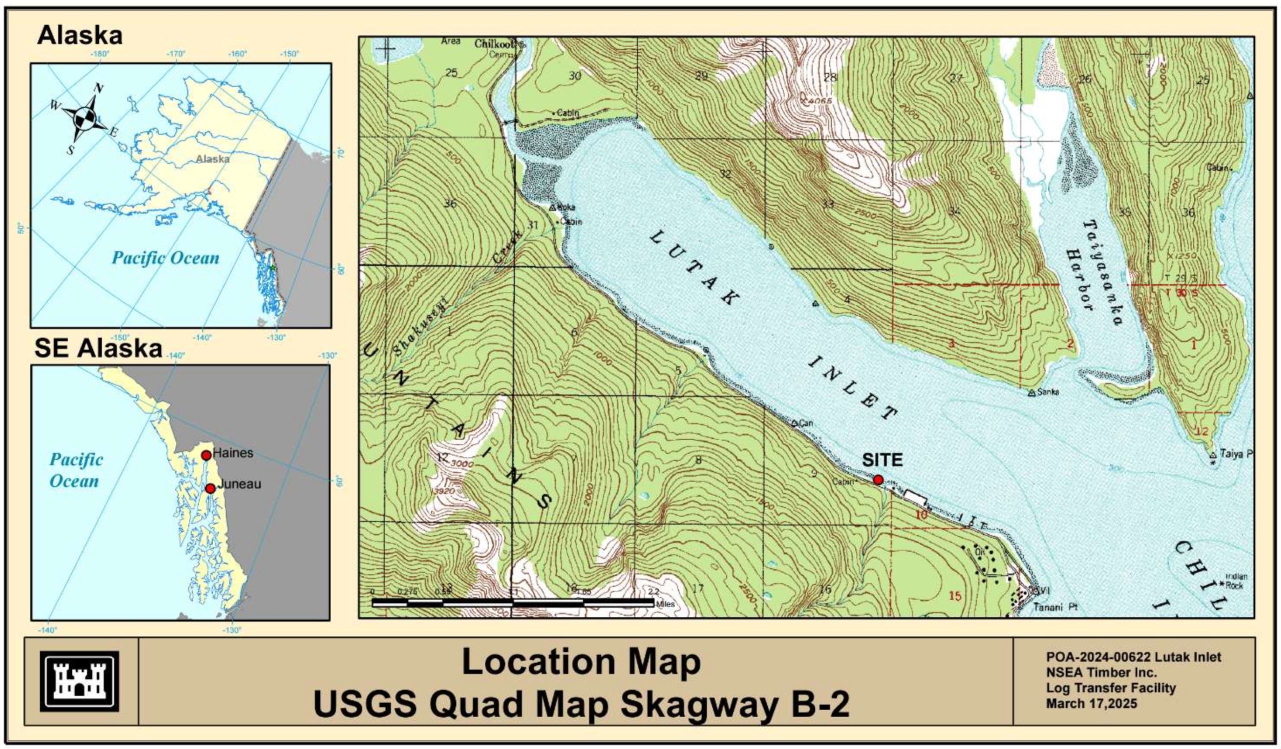
List of Reference Documents

The four primary reference documents include:

- ASCE/EPA, 2002. “Urban Stormwater BMP Performance Monitoring – A Guidance Manual for Meeting the National Stormwater BMP Database Requirements”
- FHWA, 2001. “Guidance Manual for Monitoring Highway Runoff Water Quality”
- FHWA, 2000. “Stormwater Best Management Practices in an Ultra-Urban Setting: Selection and Monitoring”
- Caltrans, 2000. “Guidance Manual: Stormwater Monitoring Protocols”



Introduction and Organization

Section 1

1.1 Introduction

This Stormwater Pollution Prevention Plan and Bark Reduction Best Management Practices Plan details the approach to be used for controlling and monitoring discharges from the Log Transfer Ramp, at the Haines Alaska Log Transfer Facility, APDES permit number AKG-701731. The Alaska DOT guidance on SWPPP includes section 10.10, Authorized Non-Storm Water Discharges. This report includes the BMP's for bark debris reduction in that section of the appendix. Engineering controls and procedures will be installed prior to discharge activities in [2025], for the treatment of stormwater runoff and reduction of bark debris discharges.

APDES permit number AKG-701731 requires the submission of a Stormwater Pollution Prevention Plan (SWPPP) to restrict stormwater runoff, and a Best Management Practices Plan (BMPP) to reduce the amount of bark debris entering the water. These documents are required to be submitted with the Notice of Intent to Discharge, for the operating permit. This combined plan is intended to satisfy these requirements.

1.2 Monitoring Plan Organization

The plan covers pollution controls, event targeting, sample collection methods, analytical procedures, data analysis and reporting, and health and safety. The monitoring plan is organized as follows:

Section 1	Introduction and monitoring plan organization
Section 2	Goals and objectives of the monitoring effort
Section 3	Stormwater monitoring requirements
Section 4	Sampling locations and types of sampling stations
Section 5	Monitoring frequency and event targeting
Section 6	Constituents of concern – monitoring parameters
Section 7	The sampling team
Section 8	Sample collection procedures
Section 9	Sample analysis methods and procedures
Section 10	Quality assurance and quality control
Section 11	Data management and reporting

The body of the report includes general descriptions of each of the above sections as well as specific policies and procedures. Provided in the appendices are the health and safety plan, mobilization checklists, and collection and reporting forms that should be taken into the field during event monitoring.

Appendix A	Standard Operating Procedures for Stormwater Monitoring
Appendix B	Site Specific Standard Operating Procedures

Objectives SWPPP and BMPP Effort

Section 2

The **Storm Water Pollution and Prevention Plan** has a primary goal of reducing pollutants entering the Lutak Inlet water body. The **Best Management Practices Plan** is focused on engineering controls and procedures to reduce the amount of bark debris entering Lutak Inlet. This plan is to mitigate both impacts from the Log Transfer Facility.

BMP monitoring can be divided into four broad categories according to typical monitoring goals and levels of technical sophistication: base level effluent monitoring, treatment monitoring, systems monitoring, and drainage basin monitoring.

Base level effluent monitoring of the Storm Water Pollution and Prevention discharge controls is recommended for the LTF, in Lutak Inlet. The purpose of effluent monitoring is to determine if the BMP's meet a predetermined goal, such as effluent quality limitation or maximum flood attenuation. Monitoring procedures, methods and personnel are discussed in this report.

AKG-701731 allows for a one-acre exception for bark debris from the zero-residue standard for marine deposits. This discharge is monitored annually for compliance. Efforts to reduce and monitor the discharge of bark debris into the marine environment from the LTF are also considered in this report. Engineering controls, maintenance procedures and the monitoring plan contained in this report are site specific in design, to mitigate impacts and reduce bark debris entering Lutak Inlet.

References for this report and additional information on defining goals can be found in:

- (FHWA, 2000) Section 4.3.1 Management Goals pg. 154-155; Section 4.3.4 Monitoring Objectives pp 163-165
- (ASCE/EPA) Section 3.1 Phase I – Determining Objectives and Scope of BMP Water Quality Monitoring Program, pp 46-56
- (FHWA, 2001) Section 2.5 Highway Stormwater Monitoring Goals pp 7-33
- (Caltrans, 2000) Appendix A Monitoring Approaches

Site Conditions and BMP Characteristics

Section

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Lutak Inlet is in Northern Southeast Alaska. BMPs and sampling sites are selected based on specific monitoring goals, data quality objectives, and other study resources or limitations.

3.1 Study Site Location

NSEA Timber Inc. operates a Log Transfer Facility (LTF), A Log Storage Area (LSA), and a Ship Moorage Area (SMA) in Lutak Inlet, Haines Alaska. The site is comprised of a shore based (LTF) and an offshore (LSA), and (SMA). The project area is located north of, and adjacent to, the State of Alaska Ferry terminal in Lutak Inlet, Haines, Alaska. The project area is designated by the following permits and authorizations.

ADEC APDES Permit: AKG-701732
ACOE: POA-2024-00622
ADNR: LAS 35438

3.2 Hydrology and Hydraulics

Lutak Inlet, located in Southeast Alaska, is considered a navigable water of the United States and is subject to the ebb and flow of the tide. Its hydrology plays a crucial role in supporting various ecological and economic activities in the region.
Key aspects of Lutak Inlet's hydrology include:

- **Tidal Influence:** As a tidal waterbody, Lutak Inlet experiences fluctuations in water levels due to the daily tides.
- **Anadromous Fish Streams:** Several anadromous fish streams are situated within or near Lutak Inlet, providing vital habitats for salmon species such as Chinook, Chum, Coho, Pink, and Sockeye. These streams contribute significantly to the overall water flow and quality within the inlet.
- **Connectivity to Larger Water Systems:** Lutak Inlet is connected to larger water systems, including Lynn Canal and Taiya Inlet, which further influences its hydrological characteristics.
- **Support for Fisheries and Navigation:** The hydrological conditions of Lutak Inlet are essential for supporting federally managed fisheries, including sport fishing and commercial fishing for salmon. Additionally, these waters are used for transporting commerce via ships and barges, as well as for recreational tourism activities such as wildlife viewing, hunting, and fishing. Lutak Inlet also supports the Alaska State Ferry Terminal and is a central transportation hub for the community.

In essence, Lutak Inlet's hydrology is characterized by its tidal nature, the presence of anadromous fish streams, and its connection to larger water systems, all of which contribute to its ecological importance and economic value.

3.3 Water Quality Issues

Lutak Inlet is not listed as an Impaired Water Body in the Environmental Protection Agencies 303D list of Impaired Water Bodies.

3.4 BMP Characteristics

The loading area adjacent to the LTF ramp consists of a clean crushed gravel substrate, graded to direct sheet flow of water into lined drainage ditches.

Best Management Practices include controlling sediment runoff by maintaining a clean substrate of gravel, free of fine particles. Directing sheet flow and point source flows through approved mitigation methods and fixtures.

BMPs can be divided according to the following types:

- Type I BMPs with well-defined inlets and outlets (e.g., detention basins, vegetated swales, catch basin inserts).
- Type II BMPs with well-defined inlets, but not outlets (e.g., infiltration basins, infiltration trenches)
- Type III BMPs with well-defined outlets, but not inlets (e.g., grass swales where inflow is overland flow along the length of the swale, buffer strips where the overland flow can be funneled into a collection vessel).
- Type IV BMPs without any well-defined inlets or outlets and/or institutional BMPs (e.g., buffer strips, catch basin retrofits, education programs, source control programs).

Type I BMPs are recommended to control water quality discharges from the Log Transfer Facility.

- (FHWA, 2000) Section 4.3.2 Physical Site and BMP Characterization pg 160-163
- (ASCE/EPA, 2002) Section 3.4.3.1 National Stormwater BMP Database Requirements pp 147-155; Section 3.4.3.2 Standard Format Examples pp 162-197

Sampling Locations and Equipment

Section

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4.1 Sampling Locations and Access

Sampling locations will include a general inspection of the loading area substrate, the LTF ramp fixture and temporary storage area for log bundles. Drainage ditches and swales will be inspected along with engineering controls to reduce turbidity and effluent discharges to the receiving water.

4.2 Sampling Stations and Equipment

A copy of the Storm Water Pollution Prevention Plan and Bark debris reduction program should be located on site and available for inspection reference. The communication tree in the guidance document provides notification channels for events and anomalies.

For manual sampling guidance refer to:

- (FHWA, 2000) Section 4.4.2 Sampling Design Plan pp 178-179
- (FHWA, 2001) Section 4.3.1 Introduction pg 62-63
- (Caltrans, 2000) Section 10 Sample Collection pp 10-4 to 8
- (ASCE/EPA, 2002) Section 3.2.4 pp 111-114, pp 124-125

Monitoring Frequency and Event Targeting

Section 5

Daily visual confirmation and monitoring is recommended to ensure the operational condition, and effectiveness of the Storm Water Pollution and Prevention Plan and its associated Best Management Practices for controlling off-site discharges. Effective control over both water/sediment discharges and Bark Debris discharges from the Log Transfer Facility is necessary to ensure receiving water quality.

5.1 Event Targeting

Storm events can result in reduced effectiveness of the mitigation methods. Engineering controls for the reduction of turbidity and for the reduction of bark debris discharges should be inspected following any major storm event. Preparation for Storm Events includes regular site maintenance and containment of fugitive substances. General guidance and additional resources may be found at:

For guidance on the typical target storm characteristics:

- (ASCE/EPA, 2002) Section 3.2.5 Recommendation and Discussion of Storm Criteria pp 127-128
- (Caltrans, 2000) Section 9 Preparation and Logistics pp 9-2 to 3
- (FHWA, 2001) Section 2.5.1.2 Develop Monitoring Plan pp 9-11

5.2 Weather Forecasting

NOAA provides the most current weather forecast for the area and should be monitored during storm events.

For guidance on tracking weather for target event prediction:

- (Caltrans, 2000) Section 9 pp 9-1 to 2, Appendix G
- (FHWA, 2001) Appendix C-4 Pre-Storm Mobilization pp C13

Selection of Analytical Parameters

Section

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The APDES Notice of Intent to Discharge requires a SWPPP and BMP Plan be submitted with the NOI. The control of water related discharges, and a best management plan to reduce the amount of bark debris entering the water is necessary to provide receiving water protection.

Bark Debris will be reduced through both physical and procedural controls aimed at reducing the amount of bark that reaches the tideline.

Storm Water quality will be managed through site design and engineering controls and site procedures to minimize exposure of fugitive substrates.

Parameter	**Method**	**Reporting Limit**	**Minimum Sample Volume/ Bottle/ Preservative**	**Holding Time**
Conventional Parameters				
Turbidity	EPA 130.2	2 mg/l	100 mL/ P/ HNO_3	6 months

The Sampling Team

Section 7

The NSEA Sampling Team refers to all personnel who are involved in logistical support, sample collection, traffic control, and safety during the actual storm event being monitored. There may be backup personnel to cover for employees that have other obligations when a monitoring event is scheduled, but at a minimum the Sampling Team includes:

- Storm Event Coordinator (1 person, can be remote)
  Monitoring Team (2-4 persons)

1.1 Storm Event Coordinator

Polly Johannsen will be the Storm Event Coordinator for monitoring. The Storm Event Coordinator (Coordinator) is responsible for observing weather patterns and selecting the events to be monitored. The coordinator will work directly with the Weather Consultant to obtain the latest weather updates and forecasts and relay them to the Monitoring Team Leader. The coordinator directs monitoring activities from a base station equipped with necessary equipment to track weather conditions, recalculate sampler pacing as conditions change, and access dependable two-way communication with weather consultants and field crews (via cell phone or radio). The coordinator makes the decision of which storms to monitor, when to initiate sampling, and calculates the runoff intervals to be used for automated sampler pacing. The coordinator should notify the Monitoring Team 72-hours in advance of a potential monitoring event.

1.2 Monitoring Team

The Monitoring Team consists of Polly Johannsen and Steve Haggitt. They are responsible for ensuring that all required equipment is ready for field operation. They are also responsible for performing the entire field monitoring activities and most of the monitoring preparation. Any member of the Monitoring Team may recommend canceling monitoring if the predicted conditions do not materialize or if health or safety of the team could be imperiled due to site conditions or extreme weather. The Monitoring Team’s other duties include contacting the analytical lab to arrange for delivery of sample bottles and drop-off of the samples at the lab once monitoring is completed.

Sample Collection Procedures

Section

8

One type of sampling procedure and field measurement method is incorporated into this monitoring plan: 1) Visual Assessment. There are general procedures for safety, cleanliness, documentation, and transport that apply to sampling. Additionally, there are more specific procedures that must be followed for the different types of sampling as well as for individual parameters sampled by similar methods. Stormwater monitoring generally takes place under difficult operating conditions, which can increase safety risks or sample collection problems for the sampling team. There also exists the potential for sample contamination during collection or transport. Adherence to the procedures outlined in this section and the Standard Operating Procedures (SOPs) can help to minimize these risks and problems as well as reduce the likelihood of errors in sampling results. Topics covered in this section include:

- Personal Safety
- Sampling Equipment and Bottles
- Clean Sampling Techniques
- Field Measurement Collection
- Transport and Chain of Custody

8.1 Personal Safety

The Health and Safety Plan approved by Polly Johanssen of NSEA Timber Inc., Safety Supervisor, should be reviewed by all field personnel before the sampling operations covered in this monitoring plan begin. Personal safety should be of primary concern while conducting all stormwater sampling related activities. All people involved in the sampling operation should be made aware of the hazards associated with monitoring and should freely voice any concerns if potential hazards become apparent. The Occupational Safety and Health Administration (OSHA) provides regulations and guidance on occupational safety, many of which are directly applicable to the types of activities involved in stormwater monitoring. It is the direct responsibility of each person involved in the monitoring program to read the Health and Safety Plan and adhere to its requirements. The following list provides a few basic health and safety procedures that can help to create a safer sampling environment.

- Do not sample alone, a minimum of two-person field crews will be used for stormwater sampling.
- Do not enter a confined space without proper training, equipment, and surface support.
- Never remove or replace manhole covers with your bare hands or feet.
- Never leave an open manhole unattended.
- Do not start staging or sampling until traffic control has been established.

When sampling near open water it is important to be aware of and avoid drowning hazards. High stormwater flows often carry branches and other debris that can entangle a person or pin them beneath submerged obstacles. Creek banks can be unstable or slippery during wet weather and caution should be observed when walking on wet unstable surfaces.

8.2 Clean Sampling Techniques

Clean sample collection techniques should be followed to minimize the potential for contamination of stormwater runoff samples. Care must be taken during all sampling operations to avoid contamination of the water samples by human, atmospheric, or other potential sources of contamination. The monitoring team should prevent contamination of any of the following items: composite bottles, lids, sample, tubing, and strainers. Whenever possible, samples should be collected upstream, and upwind of sampling personnel to minimize contamination.

8.3 Sampling Equipment

Portable Field Equipment

The parameters that will be monitored in the field using portable measurement equipment may include:

1. Temperature
2. pH
3. Conductivity
4. Dissolved Oxygen
5. Salinity

Measurements of these parameters will be accomplished using a multi-probe monitoring system if required, or determined necessary.

Grab Sampling Methods and Equipment

Grab sampling is not proposed as part of this monitoring plan.

8.4 Automated Sampling

Automated Sampling is not proposed as part of this monitoring plan.

8.5 Sample Packing and Shipping

Monitoring personnel will deliver the samples to the laboratory. Sample bottles will be placed in coolers or some other package that is rigid enough to provide protection of the samples and has insulative properties to keep samples cold. During packing, the sample from one monitoring location should not be separated into separate shipping containers unless bottles of one size need to be shipped together because of container size. If samples from a location are separated a copy of the field-sampling sheet pertaining to the bottles will be enclosed in each shipping container. Prior to shipping all sample bottles will be recorded on the packing lists, which will include the shipping date and the method of transporting the samples. Samples must be delivered to the analytical laboratory within 4 hours of sampling to ensure the maximum holding time for bacteria of 6 hours is not exceeded.

8.6 Chain of Custody

After samples have been obtained and the collection procedures properly documented, a written record of the chain of custody of each sample will be made. This record ensures that samples have not been tampered with or inadvertently compromised in any way, and it also tracks the requested analysis for the analytical laboratory. “Chain of Custody” (COC) refers to the documented account of changes in possession that occur for samples. The Chain of Custody record tracks the sampling path from origin through laboratory analysis. Information necessary in the chain of custody include:

- Name of the persons collecting the sample(s)
- Date and time of sample collection
- Location of sample collection

- Names and signatures of all people handling the samples in the field and in the laboratory
- Laboratory analysis requested and control information (e.g., duplicate or spiked samples etc.) and any special instructions (e.g., time sensitive analyses)

To ensure that all necessary information is documented a COC form will accompany each sample or set of samples. COC forms will be printed on multipart carbonless paper so that all personnel handling the samples may obtain a copy. A COC record should accompany all sample shipments, and the sample originator should retain a copy of the forms. When transferring custody of samples, the transferee should sign and record the date and time of each transfer. Each person who takes custody should complete the appropriate portion of the chain of custody documentation.

Quality Assurance and Quality Control

Section 9

9.1 Data Quality Objectives

The NSEA Timber Inc. quality assurance/quality control (QA/QC) program will be implemented to satisfy the data quality objectives of the monitoring program. The primary data quality objectives are to obtain defensible data of acceptable sensitivity and quality to:

- evaluate the stormwater management program, and
- evaluate stormwater quality
- evaluate the performance of the BMP

Analytical accuracy and precision are two parameters typically used to evaluate data quality. Accuracy is defined as the closeness of agreement between an observed value and an accepted reference value. Accuracy is expressed as percent recovery:

$$\%R = \frac{X}{T} x100 \qquad (9\text{-}1)$$

where:

% R	=	Percent recovery
X	=	Observed value of the measurement
T	=	True value of the measurement

The analytical laboratory selected for this study will evaluate the accuracy of its sample extraction and/or analytical procedures using spike samples, which may include matrix spikes (MS), laboratory control samples (LCS) and surrogate spikes. Acceptable spike recoveries must fall within statistically derived laboratory "control limits".

Precision is the agreement among a set a replicate measurements of the same parameter. Precision is quantified by calculating the relative percent difference (RPD) between duplicate measurements:

$$RPD(\%) = \left(\frac{(C_1 - C_2)}{\left[\frac{C_1 + C_2}{2} \right]} \right) x100 \qquad (10\text{-}2)$$

where:

C1	=	First sample result
C2	=	Second sample result

The analytical laboratory will evaluate precision by performing matrix spike duplicate (MSD), laboratory control sample duplicate (LCSD) and duplicate stormwater sample analyses (typically performed for inorganic parameters only). Acceptable RPDs must meet the precision criteria established by the laboratory.

The data quality objectives also include obtaining data that are comparable and representative of the water quality conditions at each monitoring location. Comparable data will be collected if comparable sampling, analysis, QA/QC and reporting procedures are implemented throughout the monitoring program. Representative samples will be collected by performing sampling activities compliant with the procedures described in this monitoring plan. Duplicate samples will be collected and the results will be used to evaluate representativeness.

Comparability expresses the confidence with which one data set can be compared to another. Data are comparable if collection techniques, measurement procedures, methods, and reporting are equivalent for the samples within a sample set.

9.2 Field Quality Assurance/Quality Control

This section summarizes the QA/QC procedures that will be implemented by field personnel to evaluate sample contamination, sampling precision and matrix interference.

Equipment Blanks

After the intermediate sample container or scoop is cleaned using the procedures described in Appendix A (SOPs), an equipment blank will be collected by pouring reagent-grade water into the apparatus. The water will be transferred into sample bottles and analyzed for the full analytical suite.

Automated Samplers

Automated samplers will be cleaned using the rinse and purge-pump-purge cycle. Prior to each storm event, an equipment blank will be collected to evaluate potential carryover from the previous storm event. The blank will be collected by pumping reagent-grade water through the intake tubing into the intermediate sample container. The water is then transferred from the intermediate sample container into the sample bottles. The volume of reagent grade water pumped through the sampler for the equipment blank will be similar to the volume of water collected during a storm event.

Field Duplicate Samples

Field duplicate samples will be collected to evaluate the precision and representativeness of the sample collection procedures as well as sample homogeneity. One duplicate composite sample will be collected for each storm event. The duplicate sample will be collected using the specified manual grab and automated sampling techniques. Twice the volume required for the analytical suite will be collected with each duplicate sample. For grab samples, intermediate sample containers will be used, and the volume collected will be apportioned equally between the intermediate containers. The water in each intermediate container will be poured into a discrete set of sample bottles. One set of bottles will be labeled with fictitious sample identification and submitted "blind" to the laboratory.

Matrix Spike Samples

Matrix spike (MS) and matrix spike duplicate (MSD) analyses will be performed by the laboratory using project samples. MS/MSDs are described in more detail in the Laboratory QA/QC section. One MS/MSD sample will be analyzed for each storm event for all the full analytical suite. Additional sample volume is required to performed MS/MSD analyses. Field crews will submit twice the required sample volume for the sample selected as the matrix spike sample. Field personnel will identify the MS/MSD sample on the chain-of-custody form.

9.3 Laboratory Quality Control

This section summarizes the QC procedures the laboratory must perform and report with the analytical data packages. These procedures are not inclusive of the QA/QC that is required for compliance with the analytical method. The laboratory will be required to implement all procedures required by the analytical methods listed in Section 6, and to implement the Standard Operating Procedures documented in its Quality Assurance Plan. The required frequency for QC procedures and evaluation criteria are summarized in Table 10.1.

Method Blanks

A method blank is prepared using reagent-grade water and is extracted and analyzed with each sample batch (typically 20 samples extracted and/or analyzed on a given day). Method blank results are used to identify potential sources of sample contamination resulting from laboratory procedures. Target analytes should not be detected in the method blank above the practical quantitative limit.

Bottle Blanks

Bottle blanks are required for trace-level metals analysis to verify the effectiveness of the cleaning procedures. After undergoing the cleaning procedures summarized in Section 9, a representative set of sample bottles will be filled with reagent-grade water acidified to pH <2 and allowed to stand for a minimum of 24 hours. Ideally, the time the bottles are allowed to stand should be as close as possible to the actual time the sample will be in contact with the bottle. After standing, the water should be analyzed for metals. If a metal is detected at or above its practical quantitative limit, the contamination source will be identified, the cleaning procedures corrected or cleaning solutions changed, and all affected bottles recleaned. Bottle blanks will be performed and the results obtained before the bottles are provided to field personnel.

Matrix Spike and Laboratory Control Samples

Matrix spikes (MS), matrix spike duplicates (MSD), laboratory control samples (LCS) and laboratory control sample duplicates (LCSDs) are performed by the laboratory to evaluate the accuracy of the sample extraction and analysis procedures. MS/MSDs are also performed to evaluate matrix interference. Matrix interference is the effect of the sample matrix on the analysis, which may partially or completely mask the response of the analytical instrumentation to the target analyte(s). Matrix interference may affect the accuracy of the extraction and/or analysis procedures to varying degrees, and may bias the sample results high or low.

The MS/MSD is prepared by adding known quantities of target analytes to a sample. The sample is then extracted and/or analyzed as a typical environmental sample, and the results are reported as percent recovery. The percent recovery for the MS/MSD analysis is expressed as:

$$\%R = \left(\frac{C_{obs} - C_{org}}{C_s} \right) x100 \qquad (10\text{-}3)$$

where:

% R	=	Percent recovery
Cobs	=	Concentration measured in MS analysis
Corg	=	Concentration measured in un-spiked sample analysis
Cs	=	MS concentration

The LCS/LCSD is prepared exactly like a MS/MSD, except a clean control matrix such as reagent-grade water is used. The LCS recoveries are used to evaluate the accuracy of the analytical procedures, independent of matrix effects (see Equation 10-1).

Surrogate Spikes

Surrogate spikes are performed for organic analysis method only. Surrogates are organic compounds that are similar to the target analytes in terms of their chemical structures and response to the analytical instrumentation, but are not usually detected in environmental samples. Surrogates will be added to each environmental sample and laboratory QC sample per the analytical method to monitor the effect of the matrix on the accuracy of the extraction and/or analysis. Surrogate analysis results are reported as percent recovery (Equation 10-1).

Duplicate Analysis

The laboratory will perform duplicate analyses that may include LCSD, MSD and replicate stormwater sample analyses (for inorganic methods only). The laboratory will evaluate the precision of the duplicate analyses by calculating RPDs (Equation 10-2).

Reporting of Petroleum Hydrocarbon Results

To avoid potential reporting of false-positive results for TPH-gasoline and TPH-diesel, the analytical laboratory will be required to flag results that do not match the laboratory standard for gasoline or diesel fuel. The laboratory will also submit sample and standard chromatograms with the analytical data packages.

9.4 Data Reduction and Validation Requirements and Methods

Laboratory Requirements

Laboratory data reduction and validation requirements will be consistent with the procedures documented in the laboratory Quality Assurance Plan and Standard Operating Procedures (SOPs). Data review will be performed by the project manager and the laboratory QA officer. Generally, the review will determine whether or not the:

- Sample preparation information is correct and complete.
- Analysis information is correct and complete.
- The appropriate SOPs have been followed.
- Analytical results are correct and complete.
- QC samples are within established control limits.
- Special sample preparation and analytical requirements have been met.
- Documentation is complete.
- Data reduction and validation steps are documented, signed, and dated by the analyst.

Independent Data Review Process

The analytical data received from the laboratory will be independently reviewed by the Project chemist to evaluate if the data are of acceptable quality to satisfy the project data quality objectives. The data quality evaluation will be performed following USEPA guidelines. Guidance is provided in the following documents:

- USEPA Guidance on the Documentation and Evaluation of Trace Metals Data Collected for Clean Water Act Compliance Monitoring (April 1995).
- USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999).
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (February 1994).

A summary of the evaluation criteria that will be used for the independent data review process is provided in Table 10.1. The data qualifiers that will be used to flag analytical results associated with QC parameters outside the evaluation criteria are defined below. All qualifiers are defined by USEPA, with the exception of the “H” qualifier.

UJ – The analyte was not detected above the reporting limit. However, the non-detect concentration is considered an estimated value.

U – The analyte was detected, however due to potential sample contamination from laboratory procedures, sampling equipment, sample handling or transportation to the laboratory, the sample reporting limit was raised to the concentration detected in the sample.

J – The analyte was positively identified. However the result should be considered an estimated value.

R – The sample result is rejected due to serious deficiencies in the ability to analyze the sample in compliance with the QC criteria or other laboratory protocols.

H – The reported petroleum hydrocarbon concentration is not representative of the fuel specified for analysis.

Table 10.1 : Summary of Quality Control Evaluation Criteria and Data Usability

QC Parameter	**Applicable Method**	**Frequency**	**Conditions Under Which Data May be Qualified**	**Reanalysis Required?**	**Use of Qualified Data**	**Reference**
Method Blank	Organic and Inorganic Methods	One per sample batch (i.e., 20 samples of a similar matrix analyzed within a 12-hour period)	Detection of Common Laboratory Contaminants in Blank* If the sample concentration is less than 10 times the associated method blank concentration, the sample result is qualified by raising the quantitative limit to the concentration detected in the sample. If the sample result is greater than 10 times the method blank concentration, no qualification is necessary. Detection of Other Analytes in Blank: If the sample concentration is less than 5 times the associated method blank concentration, the associated sample result is qualified by raising the quantitative limit to the concentration detected in the sample. If the sample result is greater than 5 times the method blank concentration, no qualification is necessary.	Yes	Qualified results should be reported as non-detect	USEPA 1994, 1995, 1999
Equipment Blank	Organic and Inorganic	One per storm event	Detection of Common Laboratory Contaminants in Blank* If the sample concentration is less than 10 times the associated equipment blank concentration, the sample result is qualified by raising the quantitative limit to the concentration detected in the sample. If the sample result is greater than 10 times the equipment blank concentration, no qualification is necessary. Detection of Other Analytes in Blank: If the sample concentration is less than 5 times the associated equipment blank concentration, the associated sample result is qualified by raising the quantitative limit to the concentration detected in the sample. If the sample result is greater than 5 times the equipment blank concentration, no qualification is necessary.	No	Qualified results should be reported as non-detect	USEPA 1994, 1995, 1999
Field Duplicate	Organic and	One per storm	Concentrations at least 5 times the quantitative limit: if the	No	Results qualified as **J** and	USEPA 1994,

Table 10.1 : Summary of Quality Control Evaluation Criteria and Data Usability

QC Parameter	Applicable Method	Frequency	Conditions Under Which Data May be Qualified	Reanalysis Required?	Use of Qualified Data	Reference
Samples	Inorganic	event	relative percent difference between the original and duplicate sample result exceeds 25 percent, sample results are qualified as **J.** <u>Concentrations less than 5 times the quantitative limit:</u> if the relative percent difference between the original and duplicate sample result is greater than the quantitative limit, detected sample results are qualified as **J.** If one result is below the quantitative limit, the quantitative limit shall be used to calculate the relative percent difference. If the relative percent difference between the original and duplicate sample is greater than the quantitative limit, the non-detect result is qualified as **UJ** and the detected result is qualified as **J.** Exceedingly high relative percent differences (e.g., 100%) will be qualified based on professional judgment. These data may be qualified as **R** (rejected).		**UJ** should be considered estimated values, but can be used to fulfill the project data quality objectives Results qualified as **R** can not be used to fulfill the project data quality objectives	1995
Matrix Spike/ Matrix Spike Duplicate	Organic and Inorganic	One per sample batch (i.e., 20 samples of a similar matrix analyzed within a 12-hour period)	Organic analyses are not qualified based on matrix spike data alone. Inorganics: Data are qualified only if the original sample concentration does not exceed the matrix spike concentration by greater than 4 times. If MS recovery is above the upper laboratory control limit, detected results are qualified a **J**, and non-detect results are not qualified. If the MS recovery is below the lower laboratory control limit, but is greater than 30%, detected results are qualified as **J**, non-detect results are qualified as **UJ.**	No	Results qualified as **J** and **UJ** should be considered estimated values, but can be used to fulfill the project data quality objectives Results qualified as **R** can not be used to fulfill the project data quality objectives	USEPA 1994, 1995, 1999

Table 10.1 : Summary of Quality Control Evaluation Criteria and Data Usability

QC Parameter	Applicable Method	Frequency	Conditions Under Which Data May be Qualified	Reanalysis Required?	Use of Qualified Data	Reference
			If the MS recovery is below 30%, detected results are qualified as **J** and non-detected results are qualified as **R** (rejected).			
Laboratory Control Sample/ Laboratory Control Sample Duplicate	Organic	One per sample batch (i.e., 20 samples of a similar matrix analyzed within a 12-hour period)	If the LCS recovery is above the upper laboratory control limit, associated detected analytes are qualified as **J**. Non-detect associated analytes are not qualified. If the mass spectral criteria are met but the LCS recovery is below the lower control limit, associated detected analytes are qualified as **J** and associated non-detect analytes are qualified as **R** (rejected). If more than half the compounds in the LCS are not within the laboratory control limits, all associated detected analytes are qualified as **J** and all associated non-detect analytes are qualified as **R** (rejected). *Professional judgment will be used to qualify sample data for the specific compounds that are not included in the LCS solution.*	Yes, to verify recoveries outside laboratory control limits	Results qualified as **J** should be considered estimated values, but can be used to fulfill the project data quality objectives Results qualified as **R** can not be used to fulfill the project data quality objectives	USEPA 1999
	Inorganic		If the LCS recovery is above the laboratory control limits, detected results are qualified as **J**. Non-detect results are not qualified. If the LCS recovery is below the laboratory control limits but greater than 50%, detected results are qualified as **J** and non-detect results are qualified as **UJ**. If the LCS recovery is below 50%, detected results are qualified as **J** and non-detect results are qualified as **R**	Yes, to verify recoveries outside laboratory control limits	Results qualified as **J** and **UJ** should be considered estimated values, but can be used to fulfill the project data quality objectives Results qualified as **R** can not be used to fulfill the project data quality objectives	USEPA 1994, 1995

Table 10.1 : Summary of Quality Control Evaluation Criteria and Data Usability

QC Parameter	Applicable Method	Frequency	Conditions Under Which Data May be Qualified	Reanalysis Required?	Use of Qualified Data	Reference
			(rejected).			
Surrogates	Organic	Added to every environmental and batch QC sample	Volatile Organic Compounds *If a surrogate recovery is above the upper laboratory control limit, detected sample results are qualified as* ***J****. Non-detect results are not qualified.* If a surrogate recovery is below the lower laboratory control limit but above 10%, detected results are qualified as **J** and non-detect results are qualified as **UJ**. If a surrogate recovery is less than 10%, detected results are qualified as **J** and non-detect results are qualified as **R** (rejected). Pesticides The guidance above for volatile organic compounds will be used but professional judgment will be used in applying these criteria as surrogate recovery problems may not directly apply to target analytes. Semi-Volatile Organic Compounds The above criteria for volatile organic compounds applies, but sample results are qualified only if two surrogates within each fraction (i.e., acid, base/neutral) are outside control limits.	Yes, to confirm non-compliance is due to sample matrix effects rather than laboratory deficiencies	Results qualified as **J** and **UJ** should be considered estimated values, but can be used to fulfill the project data quality objectives Results qualified as **R** can not be used to fulfill the project data quality objectives	USEPA 1999
Laboratory Replicate Analysis	Inorganic	One per sample batch (i.e., 20 samples of a similar matrix analyzed	<u>Concentrations at least 5 times the quantitative limit</u>: if the relative percent difference between the original and duplicate sample result exceeds the laboratory control limit, sample results are qualified as **J.**	Yes	Results qualified as **J** and **UJ** should be considered estimated values, but can be used to fulfill the project data quality	USEPA 1994

Table 10.1 : Summary of Quality Control Evaluation Criteria and Data Usability

QC Parameter	Applicable Method	Frequency	Conditions Under Which Data May be Qualified	Reanalysis Required?	Use of Qualified Data	Reference
		within a 12-hour period)	Concentrations less than 5 times the quantitative limit: if the relative percent difference between the original and duplicate sample result is greater than the quantitative limit, detected sample results are qualified as **J.** If one result is below the quantitative limit, the quantitative limit shall be used to calculate the relative percent difference. If the relative percent difference between the original and duplicate sample is greater than the quantitative limit, the non-detect result is qualified as **UJ** and the detected result is qualified as **J.** Exceedingly high relative percent differences (e.g., 100%) will be qualified based on professional judgment. These data may be qualified as **R** (rejected).		objectives Results qualified as **R** can not be used to fulfill the project data quality objectives	
False-Positive Petroleum Hydrocarbon Result	TPH-Gasoline TPH-Diesel	NA	Based on the review of the chromatograms, sample results that do not match the laboratory standard are qualified as **H**. Chromatograms should be reviewed to evaluate if the detection is due to the presence of a different petroleum hydrocarbon, or a volatile organic compound (in the case of TPH-gasoline analysis).	Yes	Use of data qualified as H depends on the information obtained from the review of chromatograms	None. This is not a standard USEPA qualifier.

9.5 Laboratory Audits

Prequalification Laboratory Audits

Prior to selecting the analytical laboratory for this project, a prequalification laboratory audit will be performed to evaluate the acceptability of laboratory conditions, practices and procedures. The laboratory audit may consist of:

- inspection of the laboratory by a qualified individual, using an audit checklist
- review of laboratory Quality Assurance Plan and Standard Operating Procedures
- evaluation of laboratory accuracy and precision criteria
- review of laboratory certifications
- evaluation of performance evaluation results.

The candidate laboratory will be required to review the Crystal Cove Monitoring Plan and authorize that analytical, QA/QC and reporting procedures will be consistent with those requirements documented herein.

Performance Audits

Performance audits are used to quantitatively assess the accuracy of measurement data through the use of performance evaluation samples. The laboratory selected for this project will participate in performance evaluation programs administered by USEPA and in other programs as mandated for State of California certification. The results of performance audit samples will be reviewed before the laboratory is selected. A performance audit may be performed any time during the project at the discretion of the project chemist and the project manager.

Technical Systems Audits

The laboratory will be required to conduct quarterly technical system audits to evaluate:

- compliance with analytical method protocols,
- data validation, reduction, reporting and management procedures
- QA requirements- e.g., method detection limit studies, documentation requirements, employee training

Data Management and Reporting

Section 10

Results will be reported by the laboratory as hard copy and as electronic files. Hard copy data will be entered into an electronic format, and checked at least once by a different person. Electronic submittal of results will be discussed with the analytical lab in advance of delivery and its format arranged. A separate record will be generated for each sample analysis.

In addition the key information such as; station ID, sample date and time, name of sampler, name of constituent), all results, units, detection limits, EPA methods used, name of the laboratory, and any field notes will be entered into the database. Additional information, such as compositing of multiple samples, or the use of grab or automatic samples, will also be included.

When reporting the laboratory results for each stormwater sample the following information will be provided:

- Sample site
- Sample date and time
- Sample number (or identification)
- Sampling technician(s)
- Detection Limit and Reliability Limit of analytical procedure(s)
- Sample Results with clearly specified units

General Standard Operating Procedures for Stormwater Monitoring (SOPs)

Appendix

A

SOP A-1 Weather Tracking and Monitoring Preparation

The Storm Event Coordinator will review the daily National Weather Service forecasts (www.nws.noaa.gov) and track all potential rainfall events.

If an event being tracked has a 75% or greater probability of generating 0.4" of rainfall within a 24 hour period, the Storm Event Coordinator will inform the Monitoring Team 72 hours before its predicted arrival and a the Team will be placed in a "Prepare Mode".

Monitoring Team "Prepare Mode"

- Order bottles from lab and alert lab of possible monitoring activities (may want to keep a supply on hand during monitoring season)
- Assemble field equipment
- Arrange team members schedule for field activities
- Arrange vehicle for monitoring activities
- For 1st event of each season, check and flag all sample locations and assess site conditions, report any potential problems to Storm Event Coordinator

The Storm Event Coordinator will maintain frequent contact with the Weather Consultant and if the forecast still predicts a target magnitude event at 48 hours before its arrival, the Monitoring Team will be placed in a "Stand-By Mode".

Monitoring Team " Stand-By Mode"

- Identify Monitoring Team and arrange schedules for field activities
- Check bottle inventory against station check list
- Initiate chain of custody procedure
- Bench test and calibrate all field equipment
- Confirm team members schedules for field activities
- Arrange for vehicle to conduct monitoring activities

At 24 hours before the event is predicted to arrive if there is still a 75% probability that the storm will generate 0.4" of rainfall within 24 hours the Storm Event Coordinator will receive QPFs every 6 hours from the Weather Consultant and a monitoring "Alert" will be issued.

Monitoring Team "Alert Mode"

- Label bottles
- Check field boxes for supplies
- Ensure a sufficient amount of ice for sampling and sample transport
- Set up sampling equipment at sites (preferably during daylight hours)

At 12 hours before a target event is scheduled to arrive, a Go/No-Go decision on monitoring will be made by the Storm Event Coordinator. The latest QPF will be obtained from the Weather Consultant and sampler programming calculations will be done for each site and this information will be relayed to the Monitoring Team.

Monitoring Team "Go"

- Mobilize Monitoring Team

- Install fully charged batteries in samplers
- Program automated samplers
- Install clean bottles in samplers
- Check all tubing, connections, and strainer placement

Monitoring Team "No-Go"

- Retrieve sampling equipment
- Inventory, clean, organize, and prepare sampling equipment for next event.

Once precipitation has begun the Monitoring Team will go into "Sample Mode"

Monitoring Team "Sample Mode"

- Contact Storm Event Coordinator and confirm "Go" decision
- Place ice in automated samplers
- (See Site Specific Standard Operating Procedures (SSOPs))

SOP A-2 Field Equipment Preparation

Two field boxes will be prepared that will contain tools, spare parts, operation manuals for equipment, copies of the Monitoring Plan and Monitoring Checklist, safety equipment, and other supplies that might be useful during sample collection and transport. Minimum field equipment should include:

Table A.1: Stormwater monitoring field equipment checklist

Documentation	Safety
Health and Safety Plan	Portable gas monitor (in one box only)
Stormwater Monitoring Plan	Safety line
Monitoring Plan Check Lists and Field Notebooks	Tripod, winch, and safety harness (1 per vehicle)
Equipment Manuals	Flashing lights for vehicle
Chain of Custody Forms/Bottle Labels/Permanent markers/pen/pencils	Traffic cones
Sampler	Cell phone (two way radios)
Graduated cylinder for sampler calibration	Flashlights (1 per person)
Spare suction line (0.24-in to 0.375-in diameter)	Gloves (protective leather and nitrile)
Spare strainer	Hard hat (1 per person)
Spare battery	Goggles (1 set per person)
Masonry anchors & screws	**Miscellaneous**
Masonry drill bits	Battery powered drill
Tubing anchors or galvanized steel strapping	Hand tools (hammer, screwdriver, pliers, knife, hacksaw, wire strippers, measuring tape)
Flowmeter	Manhole hook
Depth-measuring rod	Buckets
Data interrogator or laptop computer	Ropes
Spare Batteries	Duct tape
	Distilled water
Area velocity sensor	Watch or stopwatch
Cable ties	Digital camera
Calibration equipment (see flowmeter manual)	Heavy duty hand truck

When the Monitoring Team is placed in "Alert Mode" (approximately 24 hrs. prior to sampling) the field equipment checklist in should be gone through to ensure the equipment is available for monitoring.

SOP A-3 Bottle Organization

- Bottles of proper size and material and sufficient quantity should be prepared by the analytical lab and delivered to the Monitoring Team at least 48 hours prior to the sampling event (see sample bottle order form). Bottles should be inventoried and checked against the SSOPs for each monitoring station.
- A separate 80-quart Rubbermaid Environmental Cooler should be prepared and clearly labeled for each set of samples at each monitoring station. The cooler should include the required bottles for sampling at that site as well as bottles for blanks and duplicates as required by QA/QC plan.
- All sample bottles should be labeled prior to placement in sampler and as much information as possible should be filled out on the labels when bottles are dry. A second label or corresponding Sample ID No. should be place on sample bottle lid.
- One set of clean beakers in Ziploc bags (1-250 ml and 1-500 ml.) should be placed in coolers with bottles.
- Powder free nitrile gloves should be worn whenever handling clean bottles.

Table A.2: Sample Site Identification Information

Site Name	Site ID Number	Grab Sample Bottles	Automated Sample Bottles

SOP A-4 Clean Sampling Techniques

Sample collection personnel should adhere to the following rules while collecting stormwater samples to reduce potential contamination.

General

- No Smoking
- Do not park vehicles in immediate sample collection area, do not sample near a running vehicle.
- Always wear clean powder-free nitrile gloves when handling composite bottles, lids, sterile grab sample bottles, tubing, or strainers.
- Never touch the inside surface of a sample bottle, lid, or sampling tube (even with gloved hands) to be contacted by any material other than the sample water.
- Never touch the exposed end of a sampling tube.
- Never allow any object or material to fall into or contact the collected sample water.
- Avoid allowing rainwater to drip from rain gear or other surfaces into sample bottles.
- Do not eat or drink during sample collection.
- Do not breathe, sneeze, or cough in the direction of an open sample bottle.

Equipment Decontamination Procedures

Non-dedicated sampling equipment will be properly cleaned before sample collection Non-dedicated equipment may include:

- Teflon or fluoropolymer scoops [note- your can’t use stainless steel for trace metals analysis], buckets used to collect manual grab samples
- Water quality probe for field parameter measurements

Scoops and buckets used to transfer samples into the sample bottles required for will be cleaned as follows:

- Clean with tap water and phosphate-free laboratory detergent such as Liquinox®
- Rinse thoroughly with tap water
- Rinse thoroughly with analyte-free water
- Air dry

Before the water quality probe is used at each site, the probe will be double-rinsed with analyte-free water.

SOP A-5 Grab Sampling

Grab samples are not proposed for this project.

SOP A-6 Sampling of Field Parameters

Field parameters will be measured at each sampling location once per event. Parameters to be measured may include:

- Turbidity
- Bark Debris-Fugitive

SOP A-7 Automated Sampling

Automated Sampling is not proposed for this project.

SOP A-8 Chain of Custody Records

A chain of custody record (COC) is a legal document designed to track samples and persons who are responsible for them during preparation of the sample container, sample collection, sample delivery, and sample analysis. These form are supplied by the analytical laboratory that performing the sample analysis. The procedures for filling out these forms are as follows:

Prior to sampling

After bottles are labeled placed in coolers, fill out general information on COC form including:

- Company information and Client Code
- Project Name
- Sample Site ID
- Matrix
- Date
- Sample Numbers (unique to each bottle, see SSOPs for labeling instructions)
- Type of sample

Place COC in a Ziploc bag and tape to the lid of the cooler

After Sampling is complete

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

- Time sampling was initiated
- Number of containers
- Comments or special instructions (see SSOPs)
  Disposal requirements

Replace in Ziploc bag and tape to lid of cooler

At Laboratory or Transfer to Another Person

Whenever custody of the samples is relinquished:

- Sign and date
- Have new custodian sign and date
- Relay any special instructions
- Take one copy of COC for your records

SOP A-9 Automated Sampler Programming

Automated Sampling is not proposed for this project.

SOP A-10 Transporting, Packaging, and Shipping Samples from the Field to the Laboratory

- Clearly mark the analyses to be performed for each sample.
- Fold the field-sampling sheets and chain of custody record form and place them in plastic bags to protect the sheets during transport. Tape COCs to the lid of the cooler.
- Pack samples well to prevent breakage or leakage (samples should already be labeled) and provide additional protection for glass sample bottles (e.g. foam or bubble wrapping).
- Sample should be packed in ice or an ice substitute to maintain a sample temperature of 4°C during shipping. Ice (or substitute) should be placed in double wrapped watertight bags to prevent leaking during shipping.
- Using duct tape or packing tape, wrap the cooler twice to seal the opening.
- On the sealing tape, write the date and time the sample container was sealed
- Affix destination, identification, and FRAGILE labels to each shipping container.
- Samples must be delivered to the analytical laboratory within 4 hours of sampling to ensure the maximum holding time for bacteria of 6 hours is not exceeded.

Site-Specific Standard Operating Procedures (SSOPs)

Appendix

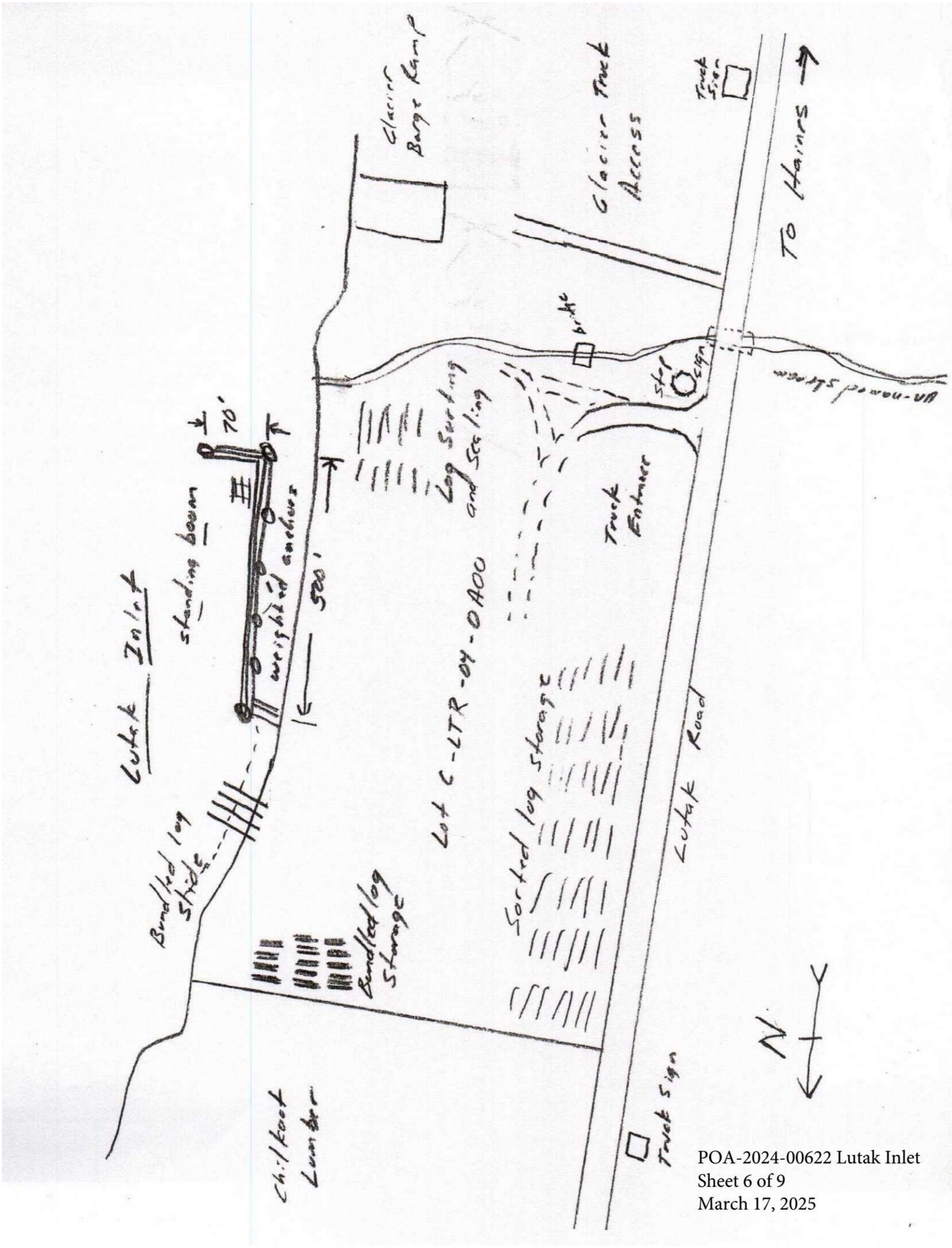
B

SOP B-1 Site Inspection and Preparation

Daily visual inspection of the site conditions will include an assessment of the gravel substrate the vehicles operate on. The substrate will be renewed as necessary to reduce impacts from fine materials that may be washed into the site drainage system and turbidity control methods. Swales ditches and culverts will be inspected for debris or obstructions. Filter controls to reduce fines entering the receiving water will be evaluated for effectiveness. Daily cleaning and maintenance of this infrastructure, as well as ensuring any loose fugitive materials on the site are covered prior to storm events is required. All chemicals, oils and fuel supplies contained on site will be in a covered area, with a containment feature.

REDUCTION OF BARK DEBRIS
AKG-701731 contains specific operating procedures and limits how wood may be introduced into the receiving water in order to reduce the impacts from bark debris deposition on the seafloor. In addition to the regulations that guide operators on proper procedures, site specific measures are proposed to further reduce the impacts from bark and other water quality discharges. Those measures include:

1. Maintenance of the LTF ramp substrate. The ramp will use crushed rock of sufficient size to inhibit the flow of bark debris down the drive down ramp.
2. Low tide ramp maintenance. During periods of low or minus tides, the drive down ramp will be back bladed to recover and properly dispose of excess bark debris on the ramp.
3. Clean and maintain the conveyance system and mitigation linings for drainage ditches, or channels along the ramp edges.
4. Limit loading speed by stacking bundles on the beaver slide and push them into the water.
5. Handle bundles of logs in the water with care to avoid unnecessary abrasion that may release bark debris.
6. Minimize Amount of Soil Exposed during Construction Activity
7. Maintain Natural Buffer Areas
8. Control Storm Water Discharges and Flow Rates
9. Protect Steep Slopes
10. Storm Water Inlet Protection Measures
11. Water Body Protection Measures
12. Down-Slope Sediment Controls
13. Stabilized Log Truck Vehicle Access and Exit Points
14. Dust Control and abatement measures.



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SOP B-2 Grab Sample Collection

Grab Sampling is not proposed for this project.

SOP B-3 Automated Sample Collection

Automated Sampling is not proposed for this project.