Haines Beach Water Quality Monitoring Program

Quality Assurance Project Plan

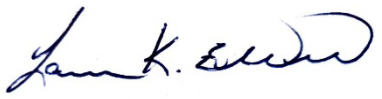
April 2025

Updates in Appendix F (June 2025)

A. Project Management Elements

Title and Approvals

Title: Quality Assurance Project Plan for 2025-2026 Haines Beach Program

Laura Eldred Beach Program Manager DEC DOW WQ NPS Section Manager Signature: 	Phone: 907-376-1855 Email: laura.eldred@alaska.gov Date: 5/01/2025
Gretchen Augat Haines Beach Project Manager DEC DOW WQ NPS Program Staff Signature: 	Phone: 907-465-5023 Email: gretchen.augat@alaska.gov Date: 4-15-25
Stacie Evans Project Manager and Lead Field Sampler Science Director Signature: 	Phone: 907-766-3542 Email: stacie@takshanuk.org Date:
Brock Tabor DEC Quality Assurance Officer (acting) DEC DOW WQ Program Staff Signature: 	Phone: 907-465-5185 email: brock.tabor@alaska.gov Date: 04-28-25

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A.1 Distribution List

This list includes the names and addresses of those who receive copies of the approved QAPP and subsequent revisions.

Table 1: Distribution List

NAME	POSITION	AGENCY/ Company	DIVISION/BRANCH/ SECTION	CONTACT INFORMATION
Laura Eldred	DEC Beach Program Manager	DEC	Division of Water/ WQ / Nonpoint Source	907-376-1855 Laura.eldred@alaska.gov
Gretchen Augat	DEC Beach Project Manager	DEC	Division of Water/WQ/ Nonpoint Source/ Southeast Region	907-465-5023 Gretchen.augat@alaska.gov
Stacie Evans	Grantee Project Manager, QA Officer and Lead Field Sampler	TWC		907-766-3542 stacie@takshanuk.org
Tracy Wirak-Cassidy	Grantee Field Support Staff	TWC		907-766-3542 tracy@takshanuk.org
Derrek Poinsette	Grantee Executive Director	TWC		907-766-3542 derek@takshanuk.org
Brock Tabor	DEC QA Officer (acting)	DEC	Division of Water/ WQ/QA	907-269-3066 brock.tabor@alaska.gov
Hope O'Neill	Grant Project DEC-Approved Laboratory Manager	Admiralty Environmental		907-463-4415 honeill@admiraltyenv.com

A.2 Project Task/Organization

The Alaska Department of Environmental Conservation (DEC) duties and responsibilities of key individuals are listed below.

A.2.1 DEC Staff

- **DEC Beach Program Manager** – Responsible for overall technical and contractual management of the project.
- **DEC Beach Project Manager** – Responsible for overall technical and contractual management of the project. If the DEC staff have direct responsibility for sample collection and analysis of data results, the DEC Project Manager assumes the responsibilities of the Lead Field Sampler/Project Manager.
- **DEC QA Officer** – Responsible for Quality Assurance (QA) review and approval of plan and oversight of QA activities ensuring collected data meets project's stated data quality goals. Conducts field audits, data audits, QA review of blind lab performance, evaluation of samples, and lab audits.

A.2.2 Grantee

- **Grantee Project Manager and/or QA Officer** – Responsible for overall technical and contractual management of the project. If Grantee staff have direct responsibility for sample collection and analysis of data results, the Grantee Project Manager assumes the responsibilities of the Lead Field Sampler/Project Manager. Responsible for ensuring all monitoring complies with the QAPP specified criteria. This is accomplished through routine technical assessments of the sample collection, analysis, and data reporting process. Assessments may include but are not limited to activities such as: on-site field audits, data audits, QA review of blind lab performance evaluation samples, and lab audits. These assessments are performed independent of overall project management.
- **Grantee Lead Field Sampler** – Responsible for sampling preparation, sample collection, sample preservation, transportation of samples to laboratory for analysis, receipt of data and transmittal of data to Grantee Project Manager. The individual will procure personal equipment of field personnel, coordinate with laboratories in planning sampling equipment needs, obtain supplies for and prepare daily sampling kits prior to departure for field location, travel to the field location, prepare necessary preservatives while in the field, perform site reconnaissance, collect site specific parameters, collect water samples, prepare samples for shipping, transport samples to laboratory, alert laboratory of successful sampling event, receive data from laboratory, verify sample result data is reliable and submit the data and all applicable Quality Assurance/ Quality Control (QA/QC) results to the DEC and Grantee Project Managers.
- **Grantee Field Support Staff** - Responsible for accompanying Grantee Lead Field Sampler into the field and supporting Grantee Lead Field Sampler during sampling.
- **Grant Project DEC-Approved Laboratory name Laboratory Manager** – Responsible for the overall review and approval of contracted laboratory analytical work, responding to sample result inquiries and method specific details. Responsible for QA/QC of laboratory analysis as

specified in the QAPP and reviews and verifies the validity of sample data results as specified in the QAPP and appropriate EPA approved analytical methods.

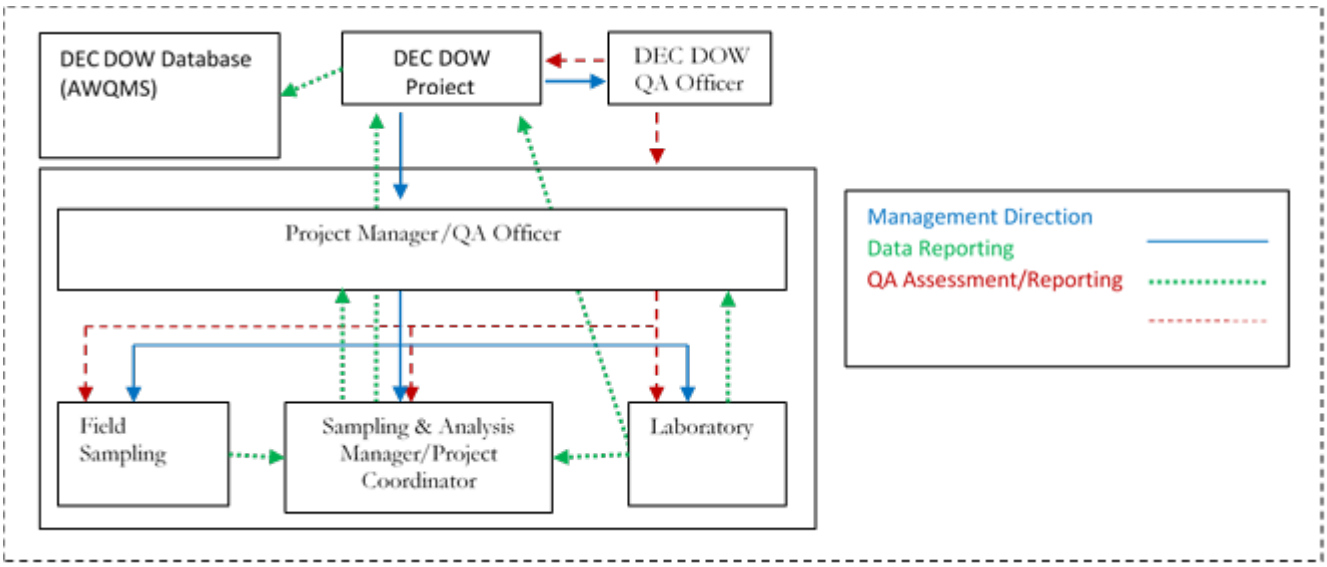


Figure 1. Project Organizational Structure

A.3 Project Definition/Background and Project Objectives

A.3.1 Project Definition

The purpose of this sampling effort is to conduct pathogen monitoring at the Haines Lutak Inlet, Portage Cove, and Pyramid Island in the Chilkat Estuary. Data gathered under this project may be used to inform the public of in-season exceedances of the Alaska Water Quality Criteria (18 AAC 70 (14)) for primary contact recreation for marine waters. Management decisions for public health and safety should be based on specific data (e.g., activities, sanitary surveys). Data must be indicative of water quality conditions to adequately assess the conditions of a waterbody to make the appropriate management decision.

The listed Haines beaches were identified as Tier 1 beaches under the Environmental Protection Agency (EPA) Beaches Environmental Assessment and Coastal Health (BEACH) Act Program (Table 2). The Haines beaches monitored under this project were nominated by members of the public through an EPA Recreational Beach Survey. Tier 1 references high priority beaches where potential bacteria sources may pose the greatest threat of human contact with contaminated waters during recreational use. Contact with waters containing fecal bacteria increases the risk of becoming ill due to pathogens contained in feces. In Alaska, Tier 1 beaches are usually accessed via the road system, near population centers, and may host fishing or other recreational activities. Communities with Tier 1 beaches are generally in a position to use local or ship samples to Department of Environmental Conservation (DEC)-approved laboratories to ensure compliance with the 6-hour EPA analytical method holding time; a DEC regulatory requirement.

Table 2. Haines Beach Monitoring Locations					
Site Name/ EPA ID	**Latitude**[1]	**Longitude**	**Site Description**	**Assessment Unit (EPA AK ID)**	**Years Monitored**
Lutak Inlet	59.324193	-135.540818	Beach off Lutak Spur Road to the east of the Chilkoot River outlet.	AK538329	2025, 2026
Portage Cove	59.229288	-135.436617	Beach off Beach Road between the Cruise Ship Dock and Fast Ferry Dock.	AK374717	2025, 2026
Pyramid Island	59.2044570	-135.4457288	Beach off Mud Bay Road directly across from Pyramid Island.	AK(TBD)	2025, 2026

A.3.2 Project Background

The Beaches Environmental Assessment and Coastal Health (BEACH) Act was passed by the U.S. Congress in 2002 in response to increased occurrences of water-borne illnesses at recreational beaches. The EPA administers grant funds to states, tribes, and territories under the BEACH Act to establish monitoring and public notification programs, such as the Alaska BEACH Program. The BEACH program has established national marine water quality monitoring and reporting standards for fecal waste contamination and notifies the public when levels exceed state standards.

DEC has and continues to implement a BEACH Grant monitoring model which partners with local interested organizations and the general public to monitor levels of fecal contamination and evaluate the potential risks associated with recreational beach use. Data associated with monitoring efforts at Alaskan beaches are on file and can be obtained by contacting the DEC Project Managers.

This project addresses a BEACH priority and will be conducted by the Takshanuk Watershed Council (TWC). TWC staff will conduct weekly bacteria monitoring for fecal coliform and enterococci at three recreational beaches in the Haines area during the summer seasons of 2025 and 2026 and assist DEC in notifying the community if results exceed state allowed limits. Monitoring will help gain a better understanding of the safety of recreational waters and build the capacity to inform Tribal and municipal citizens of ways to better protect human health and the environment while also establishing a baseline of data for future comparisons. TWC will distribute educational outreach material throughout the recreational season and conduct educational outreach events focusing on residents and recreational users at the end of the recreational year. A final report summarizing the monitoring outcomes will be available on the DEC website at project conclusion.

[1] Lat/long coordinates may be revised based on specific field sample location.

A.3.3 Project Objective(s)

The objectives for this project are to:

- Monitor selected Tier 1 beaches for fecal indicator organisms (i.e., fecal coliform and enterococci bacteria) during periods of high recreational use.
- Inform the public notification process when indicator organisms exceed Alaska Water Quality Standards (WQS).

The first objective will be achieved through designing a monitoring plan that samples at identified beaches during periods of high recreation activity by the public[2].

The secondary objective will be achieved by distributing data to the public and stakeholders through DEC's BEACH Program webpage, local news articles and radio spots, posters, handouts, listserv updates, and social media posts.

A.4 Project/Task Description and Schedule

A.4.1 Project Description

TWC will collect beach water samples from three Haines beaches during the 2025 - 2026 recreation seasons; DEC staff may assist with monitoring activities when needed. A DEC-approved laboratory will analyze samples for presence of fecal coliforms by SM 9222 D and Enterococci by ASTM D6503. The goal of this project is to gather enough data to determine whether these beaches meet the water quality standards for fecal coliforms and enterococci based on single sample and/or geometric mean calculations. A list of DEC-approved microbiological laboratories is available at: Laboratories Certified to Perform Microbiological Analyses of Drinking Water (alaska.gov).

A.4.2 Project Implementation Schedule

Table 3 includes the implementation schedule and sampling frequency for selected parameters and methods.

Table 3. Implementation Schedule for Selected Parameters and Methods

Product	Measurement/ Parameter(s)	Sampling Site	Sampling Frequency	Time Frame
Field Sampling	Ambient air temperature, marine water temperature, site conditions and in-situ measurements reported on Beach Sanitary Survey 123, photos	All sites	Each sample event	May - September
Lab Analysis	Fecal coliform (SM 9222 D), Enterococci (ASTM D6503)	All sites	Each sample event	May - September

[2] High use periods for this project are defined as ice-free months between May and September, with the highest use periods occurring in June through August within sample collection and shipping to DEC-approved laboratories restrictions.

Table 3. Implementation Schedule for Selected Parameters and Methods				
	Microbial Source Tracking		Once per recreation season	
Field Audit	Audit of field monitoring operations	All sites	at least 1 QA audit during project period	May - September
Field Replicate	Fecal coliform (SM 9222 D), Enterococci (ASTM D6503)	One site, alternate location	Each sample event	May - September

A.5 Data Quality Objectives and criteria for Measurement Data

A.5.1 Data Quality Objectives (DQOs)

Data Quality Objectives (DQOs) are qualitative and quantitative statements which are derived from the DQO Process that:

- Clarify the monitoring objectives (i.e., determine water pollutant concentrations of interest and how these values compare to water quality criteria referenced at 18 AAC 70.020(b).
- Define the appropriate type of data needed. To accomplish the monitoring objectives, the appropriate type of data needed is defined by the respective WQS. For WQS pollutants, compliance with the WQS is determined by specific measurement requirements. The measurement system is designed to produce water pollutant concentration data that are of the appropriate quantity and quality to assess compliance.

A.5.1.1 Action Limits/Levels

Table 4 below outlines the current DEC regulatory compliance limits associated with each method of analysis required by the Alaska BEACH Program.

Table 4 - 18 AAC 70(14) Water Quality Standards amended as of January 8, 2025

Designated Use Class	Use Subclass	Criteria
(A) Water Supply	(i) aquaculture	For products normally cooked, the geometric mean of samples taken in a 30-day period may not exceed 200 fecal coliform/100 mL, and not more than 10% of the samples may exceed 400 fecal coliform/100 mL. For products not normally cooked, the geometric mean of samples taken in a 30-day period may not exceed 20 fecal coliform/100 mL, and not more than 10% of the samples may exceed 40 fecal coliform/100 mL.
	(ii) seafood processing	In a 30-day period, the geometric mean of samples may not exceed 20 fecal coliform/100 mL, and not more than 10% of the samples may exceed 40 fecal coliform/100 mL.
	(iii) industrial	Where worker contact is present, the geometric mean of samples taken in a 30-day period may not exceed 200 fecal coliform/100 mL, and not more than 10% of the samples may exceed 400 fecal coliform/100 mL.
(B) Water Recreation	(i) contact recreation	In a 30-day period, the geometric mean of samples may not exceed 35 enterococci CFU/100 mL, and not more than 10% of the samples may exceed a statistical threshold value of 130 enterococci CFU/100 mL.
	(ii) secondary recreation	In a 30-day period, the geometric mean of samples may not exceed 200 fecal coliform/100 mL, and not more than 10% of the samples may exceed 400 fecal coliform/100 mL.
(D) Harvesting for consumption of raw mollusks or other raw aquatic life		The geometric mean of samples may not exceed 14 fecal coliform CFU/100 mL; and not more than 10% of the samples may exceed 31 fecal coliform CFU/100 mL[11]

A.5.2 Measurement Quality Objectives (MQOs)

Measurement Quality Objectives (MQOs) are a subset of DQOs. MQOs are designed to evaluate and control various phases (sampling, preparation, and analysis) of the measurement process to ensure that total measurement uncertainty is within the range prescribed by the project's DQOs. MQOs define the acceptable quality (data validity) of field and laboratory data for the project. MQOs are defined in terms of the following data quality indicators.

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

Detectability is the ability of the method to reliably measure a pollutant concentration above background. DEC Division of Water (DOW) uses two components to define detectability: method detection limit (MDL) and practical quantification limit (PQL) or reporting limit (RL).

- The MDL is the minimum value which the instrument can discern above background but has no certainty to the accuracy of the measured value. For field measurements the manufacturer's listed instrument detection limit (IDL) can be used.
- The PQL or RL is the minimum value that can be reported with confidence (usually some multiple of the MDL).

Note: The measurement method of choice should at a minimum have a practical quantification limit or reporting limit 3 times more sensitive than the respective DEC WQS.

Sample data measured below the MDL is reported as ND or non-detect. Sample data measured ≥ MDL but ≤ PQL or RL is reported as estimated data. Sample data measured above the PQL or RL is reported as reliable data unless otherwise qualified per the specific sample analysis.

Precision is the degree of agreement among repeated measurements of the same parameter and provides information about the consistency of methods. Precision is expressed in terms of the relative percent difference (RPD) between two measurements (A and B).

For field measurements, precision is assessed by measuring replicate (paired) samples at the same locations and as soon as possible to limit temporal variance in sample results. Field and laboratory precision is measured by collecting blind (to the laboratory) field replicate or duplicate lab samples. For paired and small data sets project precision is calculated using the following formula:

$$Precision = \frac{(A-B)}{\left((A+B)/2\right)} \times 100$$

For larger sets of paired precision data sets (e.g., overall project precision) or multiple replicate precision data, the following formula may be used:

RSD = 100*(standard deviation/mean)

Note: Precision assessed only when both paired values ≥:

- 5 times PQL (fecal coliforms SM 9222D)
- 2 times PQL (E. coli SM 9222B)

Bias (Accuracy) is a measure of confidence that describes how close a measurement is to its "true" value. Methods to determine and assess accuracy of field and laboratory measurements include, instrument calibrations, various types of QC checks (e.g., sample split measurements, sample spike recoveries, matrix spike duplicates, continuing calibration verification checks, internal standards, sample blank measurements (field and lab blanks), external standards), performance audit samples (DMRQA, blind Water Supply or Water Pollution PE samples from A2LA certified, etc.), Bias/Accuracy is usually assessed using the following formula:

$$Accuracy = \frac{Measured\ Value}{True\ Value} \times 100$$

Completeness is a measure of the percentage of valid samples collected and analyzed to yield sufficient information to make informed decisions with statistical confidence. As with representativeness, data completeness is determined during project development and specified in the QAPP. Project completeness is determined for each pollutant parameter using the following formula:

$$\frac{T - (I + NC)}{T} \times 100\% = Completness$$

Where: T = Total number of expected sample measurements.
I = Number of invalid samples measured results.
NC = Number of sample measurements not produced (e.g., spilled sample, etc.).

This project has a goal of 80% data completeness. In 2 years, 32 sampling events are planned. The data collected is intended to provide members of the public with pertinent recreational information.

Representativeness is determined during project development and specified in the QAPP. Representativeness assigns what parameters to sample for, where to sample, type of sample (grab, continuous, composite, etc.) and frequency of sample collection.

Comparability is a measure that shows how data can be compared to other data collected by using standardized methods of sampling and analysis.

Monitoring shall be conducted in accordance with EPA-approved analytical procedures by state certified or equivalent laboratories and in compliance with 40 CFR Part 136, Guidelines Establishing Test Procedures for Analysis of Pollutants, as listed in Table 5. Field parameters will be measured using a HANNA® handheld probe, or an equivalent sonde (minimum resolution of 0.1 °C or better) as a point measurement. The device used must be verified prior to each sampling event[3].

Each sampling location is fixed and located by a GPS coordinate. The locations do not change throughout the sampling season, but the area of sampling may change due to targeted parameters, field conditions, and tides during a sampling event. Sampling is conducted in accordance with the Haines BEACH Monitoring Handbook.

[3] See Appendix B: Standard Operating Procedure for Ambient Water Collection for Pathogen Monitoring and the Haines BEACH monitoring handbook for more information on equipment calibration and maintenance schedules.

Table 5. Project Measurement Quality Objectives						
Group	Analyte	Method	MDL	PQL	Precision (RPD)	Accuracy
Pathogens	Fecal coliform	SM 9222 D, Membrane filtration (MF)	1.0 CFU/100 mL	2.0 CFU/100 mL	±60%	NA
	Enterococci	D6503-99, Enterococci by Enterolert	1.0 MPN/100 mL	10 MPN/100 mL	±60%	NA
	Microbial Source Tracking	Human_HF183 Canine_BacCan Avian_GFD	NA	NA	±60%	NA
Field	Temperature air and water, pH, turbidity, dissolved oxygen	EPA 170.1, 150.2, 180.1, 360.1	NA	0.1°C	±0.2°C	± 0.2 °C

A.5.3 Data Validation and Verification

Data validation determines whether the data sets meet the requirements of the project specific intended use as described in the QAPP. That is, were the data results of the right type, quality, and quantity to support their intended use? Data validation also attempts to give reasons for sampling and analysis anomalies, and the effect that these anomalies have on the overall value of the data.

All data generated shall be validated in accordance with the QA/QC requirements specified in the methods and the technical specification outlined in this QAPP. Raw field data will be maintained by the Program staff who collect it. Raw laboratory data shall be maintained by the laboratory. The laboratory may archive the analytical data into their laboratory data management system. All data will be kept at a minimum of 5 years.

The primary goal of verification is to document that applicable method, procedural and contractual requirements were met in field sampling and laboratory analysis. Verification checks to see if the data was complete, if sampling and analysis matched QAPP requirements, and if Standard Operating Procedures (SOPs) were followed.

The summary of all laboratories' analytical results will be reported to the DEC and Grantee BEACH Project Manager staff. Protocols for laboratory data validation and verification are listed in Section B.4.2 and as specified in the laboratory's QAPP and SOPs.

Grantee and/or Subcontractors staff will verify that equipment used to collect field data is reading within acceptable limits before each sampling event using calibration solution. After sampling is completed, staff will complete a post verification check on equipment using calibration solution. Staff

will record the date, name of equipment operator, calibration solution lot number and expiration date, reading of the standard solution, and verification pass/fail in a logbook kept with the field instrument.

Unacceptable data (i.e., data that do not meet the QA measurement criteria of precision, accuracy, representativeness, comparability, and completeness) will not be used for further analyses but will be documented. Any problems with the data will be clearly defined, flagged appropriately and data used clearly delimited and justified. Any action taken to correct QA/QC problems in sampling, sample handling, and analysis must be noted in the QA BEACH Data Checklist. Under the direction of the DEC and Grantee Beach Project Managers, project staff **will document all QA/QC corrective actions taken**.

The Grantee Project Manager is responsible for reviewing electronic or paper data sheets for accuracy and completeness within 48 hours of each sample collection activity, if possible. The Grantee Project Manager will compare the sample information in the electronic or paper field sheets with the laboratory analytical results to ensure that no transcription errors have occurred, and to verify project QC criteria have been met (e.g., samples preserved, and sample hold times met as required by QAPP and method, relative percent difference (RPD) results for blind sample replicates).

RPD's greater than the project requirements will be noted. The Grantee Project Manager, along with supervisors and/or the Project QA Officer, if necessary, will decide if any QA/QC corrective action will be taken if the precision, accuracy (bias) and data completeness values exceed the project's MQO goals.

The DEC and Grantee Beach Project Managers and the QA Officer will review and validate data against the Project's defined MQOs prior to final reporting stages. If there are any problems with quality sampling and analysis, these issues will be addressed immediately, and methods will be modified to ensure that data quality objectives are being met. Modifications to monitoring will require notification to DEC and subsequent edits to the approved QAPP.

Only data that have been validated and qualified, as necessary, shall be provided to DEC Division of Water and entered in the applicable database (AWQMS, WQX).

A.6 Special Training Requirements/Certification

DEC Beach Program Manager is responsible for overall technical and contractual management of the project. The current manager is up to date on current management training(s) and has over 20 years of experience in the Nonpoint Source (NPS) Section.

DEC Beach Project Manager is responsible for overall technical and contractual management of the project. The current manager serves as DEC BEACH Grant coordinator and has 15 years of experience in administrating BEACH Grant Monitoring Program grants. The experience associated with their duties allows them to be effective in carrying out duties as Project Manager.

DEC QA Officer is responsible for ensuring that all QA requirements for sample collection and data analysis are met for the project. The current acting QA Officer has over 20 years of experience in water quality.

For BEACH monitoring projects, the grantee is responsible for providing a knowledgeable and competent grant manager, project QA Officer and Lead Field Sampler.

Grantee Project Manager and/or QA Officer are responsible for coordinating efforts for field sampling, including equipment and supplies procurement, planning and leading field sampling events. The Project Manager is also responsible for preliminary QA/QC of field data. She has 6 years' experience with water quality sample collection; chain of custody procedures; equipment operation, calibration, and troubleshooting; data management; QA protocols; and safety training.

Grantee Subcontractor Lead Field Sampler will assist the Grantee Project Manager with field sampling, including equipment and supplies procurement, equipment maintenance, data organization, and other tasks as needed. She has 6 years' experience with water quality sample collection, chain of custody procedures, data management, equipment calibration, and safety training.

Grant Project DEC-approved Laboratory is responsible for performing analytical work and must have the requisite knowledge and skills in execution of the analytical methods being required. Information on laboratory staff competence is usually provided in each lab's Quality Management (QMP) and/or Quality Assurance Plan (QAP). The laboratories to be used for this project will be Alaska Drinking Water certified microbiological laboratories or maintain equivalent certification. It is the responsibility of the contracted lab to maintain a current copy of the laboratory's QA Plan and attendant method specific SOPs on file with the DEC's Beach Program Manager, Project Manager, and DOW QA Officer during the duration of laboratory use.

DEC Beach Program Manager: Laura Eldred, DEC DOW WQ NPS Section Manager

DEC Beach Project Manager: Gretchen Augat, DEC DOW WQ NPS Program Staff

DEC QA Officer: TBD, DEC DOW WQ Program Staff

Grantee Project Manager, QA Officer and Lead Field Sampler: Stacie Evans, Science Director

Grantee Project Field Support Staff: Tracy Wirak-Cassidy, Education Coordinator

Grantee Project Lead Support Staff: Derek Poinsette, Executive Director

Table 6. Training and Certification Requirements

Specialized Training/Certification	Grantee Project Lead Field Sampler	Grantee Project Lead Support Staff	Grantee Project Manager and/or QA Officer
Safety training	**X**	**X**	**X**
Water sampling techniques	**X**	**X**	**X**
Instrument calibration and QC activities for field measurements	**X**	**X**	**X**
QA principles			**X**
Chain of Custody procedures for samples and data	**X**	**X**	**X**

A.7 Documents and Records

A.7.1 QA Project Plan Distribution

The Grantee Project Manager and/or QA Officer are responsible for QAPP revisions/updates. The Grantee Project Manager will provide drafted QAPP versions to DEC program manager, DEC QA Officer,

and Project QA Manager for review(s) and finalization. This QAPP will be reviewed and revised annually or earlier as needed. Minor revisions may be made without formal DEC Program Manager and/or QA Officer comment. Such minor revisions may include changes to identified project staff, QAPP distribution list, and minor editorial changes. Revisions to the QAPP that affect state monitoring Data Quality Objectives, Method Quality Objectives, method specific data validation "critical" criteria and/or inclusion of new monitoring methods must solicit input/ and pre-approval by DEC DOW QA Officer/DEC Project Manager before being implemented. If updates are required, tracked changes will be used by all parties for full transparency. Following acceptance of revisions, signatures from all representatives are collected. Due to the physical distance between potential signatories of this document, electronic signatures will be acceptable. Once all signatures have been obtained, the final document is distributed to all parties in PDF format by the DEC Program Manager.

A.7.2 Field Documentation and Records

Beach Sanitary Survey 123 will be provided for all field crews (Appendix A). An electronic tablet or cell phone may be used to digitally record field measurement. The lead field sampler is responsible for ensuring that all field data are correct.

Field activities and observations will be recorded on Beach Sanitary Survey 123. Any comments or descriptions will be noted in the comments with enough detail so that participants can reconstruct events later if necessary. Survey results will include descriptions of any changes at the site personnel and responsibilities or deviations from the QAPP/SAP as well as the reasons for the changes. Requirements for the field survey entries will include the following.

- Entries will be made while activities are in progress or as soon afterward as possible (the date and time that the notation is made should be included, as well as the time of the observation itself).
- Each entry will have its own unique identifier for the sampling event.
- Unbiased, accurate language will be used.
- Any deviation from the sampling plan will be included in the comments of the Beach Sanitary Survey 123.
- When field activity is complete, the electronic field survey form will be submitted and saved to the digital project file.

In addition to the preceding requirements, the person recording the information must have an additional field crew member review the data entry, on the electronic survey application. After data review is complete, the Grantee Project Manager or Grantee Project Lead Field Sampler will record the data electronically in a DEC-provided excel workbook. The DEC Beach Project Manager will conduct the first round of quality assurance reviews, including field and laboratory datasets, and then request a QA review from the DEC Beach Program Manager. The data will then be submitted to the DEC QA Officer for review. After the final QA review is completed, data will be uploaded electronically into state and federal databases (e.g., AWQMS, EPA BEACON, WQP). The type of information that may be included in the electronic survey and/or paper field data forms includes the following.

- Names of all field staff
- A record of site health and safety meetings, updates, and related monitoring
- Station name and location
- Date and collection time of each sample
- Observations made during sample collection, including weather conditions, environmental conditions, complications, potential bacteria sources, and other details associated with the sampling effort
- Photo log[4]

Beach Sanitary Survey 123 and sample chain-of-custody forms will be completed for all samples and kept in the project file. Laboratory data results from the laboratories are recorded on laboratory data sheets, bench sheets and/or in laboratory logbooks for each sampling event. These records as well as control charts, logbook records of equipment maintenance records, calibration, and quality control checks, such as preparation and use of standard solutions, inventory of supplies and consumables, check in of equipment, equipment parts and chemicals are kept on file at the laboratory.

Any procedural or equipment problems are recorded in the Beach Sanitary Survey 123. Any deviation from this Quality Assurance Project Plan will also be noted in the DEC-provided Beach Sanitary Survey 123 and the DEC-provided QA Beach Data Checklist. Data results will include information on field and/or laboratory QA/QC problems and corrective actions.

In addition to any written report, data collected for the project will be provided electronically in an AWQMS compatible format, which will be provided by DEC.

All records will be retained according to the state records retention schedule. Table 7 includes a description of types of records/documents that may be included.

Chain of Custody Forms and Custody Seals

The original chain of custody form(s) will accompany the sample to the laboratory. When portions of the sample are sent to another laboratory (e.g., for many of the priority pollutants), a copy of the chain of custody will be made and this will accompany the samples. At each transfer of the sample, the transfer will be indicated on the chain of custody form. The sampler listed on the chain of custody should have custody of the sample until the COC is relinquished by that person and received by the next party signed on the COC. Custody of the sample means either in the sampler's physical possession, within their view, or locked/secured with restricted access. If the sample is unable to maintain this (such as flying with samples as checked baggage), a custody seal will be applied to the sampling cooler for at least that duration.

A scanned PDF of the original chain of custody form(s) will be included with the final data package including the COC(s) transferring samples to other labs.

Photograph

[4] See Appendix F: Unmanned Aerial Vehicle Technology Use for specific information on data requirements for drone use.

A photograph of the sample collection point will be taken during every sampling event. The photo will include the ship name, sampling port ID, date, and time. The photograph will also include identifying marks or signage at the sampling point if possible.

Table 7. Project Documents and Records

Categories	Record/Document Types
Site Information	Site maps
	Site pictures
Environmental Data Operations	QA Project Plan
	Field Method SOPs
	Beach Sanitary Survey 123
	Sample collection/measurement records
	Sample Handling & Custody Records
	Inspection/Maintenance Records
Raw Data	Lab data (sample, QC, and calibration) including data entry forms
Data Reporting	Progress reports
	Project data/summary reports
	Lab analysis reports
Data Management	Data quality assessments
	Site audits
	Lab audits
	QA reports/corrective action reports
	Corrective Action Response

B. Data Generation and Acquisition

B.1 Sampling Process Design (Experimental Design)

Monitoring will be conducted at preselected locations identified in Appendix A.

Project staff will develop a project contract with the laboratory that will be used for the project. The contract will specify the lab charges for sample analysis for the duration of the project.

Conduct marine water quality monitoring during recreational use season for bacteria at three recreational beaches: Lutak Inlet, Portage Cove, and Pyramid Island. Sampling events should occur weekly at each beach location for two recreational seasons (typically May – early September). The sampling schedule is available upon request. A narrative description of the time and relevant environmental conditions present at the time in which each sample is collected will be recorded in Survey 123.

Water samples will be analyzed to determine the population densities of microbes that indicate the presence of fecal contamination; microbes to be enumerated will be enterococci and fecal coliforms, with the results reported per 100 mL marine water.

For each sample collected, the date and time will be noted. Sample containers will be delivered to labs for analysis within the six (6)[5] hour hold time required for pathogens for accurate results. The procedures for collection of samples are identified in Appendix B.

B.1.1 Define Monitoring Objective(s) and Appropriate Data Quality Objective(s)

Project schedule and tasks may be adjusted as needed due to unplanned or unavoidable events.

TASK 1: Planning documents: BEACH Monitoring Handbook and Quality Assurance Project Plan (QAPP)

Description: Use DEC's generic templates at http://beaches.alaska.gov/ to complete a project specific BEACH Monitoring Handbook and Quality Assurance Project Plan (QAPP) for DEC review and approval.

Deliverable(s) and Permits:

	Deliverable	Due Date:
1a	Draft BEACH Monitoring Handbook for DEC review (Word)	April 1, 2025
1b	Final Beach Monitoring Handbook incorporating review comments (Word, PDF)	May 1, 2025
1c	Draft QAPP for DEC review (Word)	April 1, 2025
1d	Final signed QAPP incorporating review comments (Word, PDF)	Prior to first sampling event
1e	Updated BEACH Monitoring Handbook and QAPP in 2025 if needed (Word and PDF)	April 1, 2025

TASK 2: Monitor beach water quality

Description: Develop a contract with a DEC-approved laboratory for fecal coliform and enterococci, and a contract for Microbial Source Tracking (MST) to be used for the project. The contract will specify the laboratory charges for sample analysis for the duration of the project.

[5] Max hold time for pathogen samples is: 6 hours in the field, 2 hours in the laboratory (total of 8 hours hold time).

Additional laboratory charges may be incurred for expedited enterococcus sample results reporting to meet the 36-48 hour reporting time.

Conduct marine water quality monitoring during recreational use season for bacteria at three recreational beaches: Lutak Inlet, Portage Cove, and Pyramid Island in the Chilkat Estuary. Sampling events should occur weekly at each beach location for two recreational seasons (typically mid-May through early September).

Collect one (1) near-shore marine water sample at each beach location for fecal coliform bacteria (SM 9222D) and enterococci (ASTM D6503-99) using the DEC-approved sampling procedures and approved QAPP. Submit the samples to a DEC-approved laboratory within the six (6) hour holding time. Collect one (1) replicate sample for each bacteria analytical test per sampling event for quality assurance.

Collect near-shore marine water samples for MST once each summer for each project beach, field filter and preserve the samples using laboratory provided materials and submit to laboratory experienced in MST analytical method. Determine the MST host markers based on potential bacteria sources within the beach area(s) (e.g., dog, avian, horse, ruminant, etc.). DEC requires the human marker to be one of the host markers. Collect MST samples at the same date/time as the bacteria samples.

Ideally, pathogen sample collection should occur prior to and during low tide at the outgoing tides (ebb tide) and incoming tides (flood tide). Sampling events should alternate site collection between these ebb and flood tide cycles to capture various tidal scenarios at each site location. However, flight times to ship samples out to the laboratory may change this schedule.

Complete the DEC-provided Marine Beach Sanitary Survey 123, chain-of-custody form, and site photos at each monitoring location for each monitoring event.

Include photos of sample collection and project samplers during the sampling events for use as supporting documentation and for outreach and education materials.

Permission to access land for sampling purposes may need property owner(s) coordination.

Deliverable(s) and Permits:

	Deliverable	**Due Date:**
2a	Laboratory results (if DEC has not already received)	Within 36 hours of the sampling event from May - September
2b	Sanitary surveys (Survey 123)	
2c	Beach and sampling photos (JPEG preferred)	
2d	Chain of Custody form copies (PDF)	
2e	Copies of other data information (e.g. verification and calibration records)	
2f	Land access permission documentation (if necessary)	Prior to first sampling event

TASK 3: GIS Mapping

Description: Develop a GIS map that shows monitoring locations in relation to potential bacteria sources that may be contributing to the nearshore marine environment. The GIS map should show the spatial relationship between residential/public waste treatment and septic systems, boat harbors, topographic contours, surface water hydrology, potential pollution sources, and beach survey data. DEC uses NAD83/Alaska Albers.

Deliverable(s) and Permits:

	Deliverable	**Due Date:**
3a	Draft GIS map	October 31, 2025 and 2026
3b	Final GIS map	December 31, 2025 and 2026

TASK 4: Community Notifications

Description: Develop a community notification email list for parties interested in sample results. Update DEC-provided draft potential health advisory posting with specific information for the project and beaches. Assist DEC working with local landowners to post advisory at the beaches if results exceed water quality criteria.

Ensure that DEC is on the laboratory result email to expedite result receipt, and assist DEC with beach advisory notifications, if needed.

Develop social media messages throughout the project to inform the public on the project, results, and tips for reducing bacteria at area beaches. Provide draft copy to DEC project manager prior to posting.

Deliverable(s) and Permits:

	Deliverable	**Due Date:**
4a	Notification email list	May 1, 2025
4b	Beach advisory posting example	May 1, 2025
4c	Copies of social media posts (screenshots)	Through recreational season

TASK 5: Educational Outreach

Description: Conduct a community educational outreach event to share the BEACH program prior to the start of the first recreational season, and two additional events to present sampling results and findings following both recreational seasons. Prepare event invitations, agendas,

and presentations. Lead and participate in the event. Keep discussion notes and participant lists. The DEC project manager will be available to participate.

Develop outreach material to communicate the BEACH program and sampling results to the community. Outreach will be applicable to the Haines community and may include flyers, radio PSA's, social media posts, PowerPoint slide presentation, or applicable communication platforms.

Outreach materials will be approved by DEC before distributing.

Work with DEC to develop a 15-30 second public service radio message about the project and tips for reducing bacteria sources at beaches to protect health. Run the radio message on the local radio station during both recreational seasons. The exact schedule depends on the budget and number of stations available in the community.

Deliverable(s) and Permits:

	Deliverable	**Due Date:**
5a	Draft Outreach materials including flyers and presentation materials (Word, PowerPoint)	April 1, 2025
5b	Final Outreach materials including flyers and presentation materials (Word, PDF, PowerPoint)	May 1, 2025
5c	Draft meeting invitations, agendas, and any other materials for DEC review (use applicable software)	April 1, 2025
5d	Final meeting invitations, agendas, and any other materials; copy of event notes and participant lists (use applicable software)	September 30, 2025 and 2026
5e	Draft radio public service announcement language	April 1, 2025
5f	Metrics on number of stations and spots the radio message played	September 30, 2025 and 2026
5g	Copy of radio digital file	September 30, 2025 and 2026

TASK 6: Project Data Processing

Description: Provide monitoring location details to DEC project manager including GPS coordinates with the start and end latitude and longitude of each beach segment being sampled. During the sample season, review all laboratory results for quality assurance purposes as soon as received from the laboratory, and work with the laboratory on any data

discrepancies or issues. Compile and enter all sampling and monitoring data (e.g., analytical results, field parameters, data flags, air and water temperature, in-situ data, and any other project data into DEC-provided data template). Submit the completed water quality data entry template to DEC for review. Revise data template as needed after DEC review. DEC will import the data into Alaska's water quality database (AWQMS). Complete the requested sections of the DEC-provided data processing checklist listed below.

Data processing steps to be completed by the grantee

Field Work/Pre-Database	1a. During the field season, review raw data files (electronic data deliverables, instrument verification/calibration records) as they are received and adjust as needed, keeping DEC project manager informed. Document issues/changes on the checklist.
	1b. Once all data is received, review for overall project success and compliance with project QAPP. Conduct a detailed evaluation of Survey 123 records, in-situ field data, and analytical results. Document all data that fails QA and provide justification for any rejected results.
Database Prep	2. Provide the DEC project manager with supporting project information like field notes and supporting records.
Database Import	3. Enter data into the DEC-provided Excel spreadsheet data entry template and review for accuracy and completeness. Submit the spreadsheet to the DEC project manager for review and database importing. The DEC project manager and grantee will resolve data validation errors until the data is successfully in the database. DEC will create a standard export of the project data. The grantee will review the export for completeness and correctness and to make corrections as needed (this review may occur multiple times until the data is finalized).

Deliverable(s) and Permits:

	Deliverable	Due Date:
6a	Requested sections of the DEC-provided Data QA Checklist (fill in through the recreational season)	October 31, 2025 and 2026
6b	Monitoring location information	May 1, 2025 and 2026 (if necessary)
6c	Draft AWQMS data template for DEC review (DEC-provided Excel workbook)	October 31, 2025 and 2026
6d	Corrected AWQMS data template (as needed) (DEC-provided Excel workbook)	November 30, 2025 and 2026

TASK 7: Annual Monitoring Reports

Description: After the end of each recreational season, evaluate results and prepare a draft and final report of findings and conclusions. The second-year report should combine findings from both recreational years. DEC will provide a reporting template for use.

The monitoring report will include an abstract, background information, project objectives, methods, QA review summary, results summary, conclusion, and recommended next steps (optional). The results summary will have data exceedances using DEC Water Quality Standards 18AAC70 (14), 30-day geometric mean calculations, and include narrative description and tabular/graphical formats to evaluate monitoring results. The quality assurance review will summarize the integrity of the reported analytical results as compared to the data quality objectives described in the QAPP. Include appropriate references throughout the report, and necessary project data. Incorporate photos and maps within the report. Include an appendix with a table showing all the monitoring dates, locations, and results.

Deliverable(s) and Permits:

	Deliverable	Due Date:
7a	Draft (year 1) Beach Monitoring Report for DEC review (Word)	December 5, 2025
7b	Final Beach Monitoring Report incorporating DEC edits (Word, PDF)	February 15, 2026
7c	Draft (combined years) Beach Monitoring Report for DEC review (Word)	December 5, 2026
7d	Final Beach Monitoring Report incorporating DEC edits (Word, PDF)	February 15, 2027

B.1.2 Identify the Site-Specific Sample Collection Location(s), Parameters to be Measured, and Frequencies of Collection

Table 8. Site Location and Rationale			
Site Name	**Latitude**	**Longitude**	**Site Description**
Lutak Inlet	59.324193	-135.540818	Beach off Lutak Spur Road to the east of the Chilkoot River outlet.
Portage Cove	59.229288	-135.436617	Beach off Beach Road between the Cruise Ship Dock and Fast Ferry Dock.
Pyramid Island	59.2044570	-135.4457288	Beach off Mud Bay Road directly across from Pyramid Island.
Note: GIS maps of sampling locations are shown in the Appendix.			

B.2 Sampling Method Requirements

Methodology for specific sampling protocols can be found in:

- Alaska BEACH Program Monitoring Handbook
- Appendix B: Standard Operating Procedure for Ambient Water Collection for Pathogen

B.2.1 Sampling Method Requirements

Laboratory samples will be listed as "grab" on the Chain-of-Custody forms and data sheets while field samples will be listed as "In situ" as defined below.

Grab Samples – Sample bottles will be filled sequentially, normally being filled to the shoulder of the bottle, leave a small space for expansion and mixing. The laboratory will provide sampling instructions with the sample bottles for specific samples.

In Situ Samples – In situ water measurements will be taken as point readings HANNA® Handheld probe and/or sonde. In situ measurements include air and water temperature, pH, and dissolved oxygen.

Turbidity – The sample bottles provided with the HACH® Turbidimeter will be used. Bottles will be rinsed with ambient water and then filled to the level recommended by the manufacturer. Follow the manufacturer's instructions for operating the Turbidimeter. Check that all calibration standards are not expired before use. See BEACH Monitoring Handbook for more information.

B.2.2 Sample Containers and Equipment

The sample container, preservation, and holding time requirements are tabulated below.

Table 9. Preservation and Holding Times for the Analysis of Samples					
Analyte	**Matrix**	**Container**	**Necessary Volume**	**Preservation and Filtration**	**Maximum Holding Time**
Temperature air and water, pH, turbidity, dissolved oxygen	Surface Water	NA, direct measurement			
Fecal coliform	Surface Water	PA	150 mL	Cool 4 to 10°C, do not freeze	8 hours total, (6 hrs. field, 2 hrs. lab)
Enterococci	Surface Water	PA	150 mL	Cool 4 to 10°C, do not freeze	8 hours total, (6 hrs. field, 2 hrs. lab)
Microbial Source Tracking	Surface Water	PA	100 ml	Cool 4 to 10°C, do not freeze	48 hours or 3 weeks using preservation kit
Notes: G = glass, PA = autoclavable plastic, PC = polycarbonate					

B.3 Sample Handling and Custody Requirements

B.3.1 Sample Custody Procedures

Samples and sample containers will be maintained in a secure environment from the time the bottles leave the field until the samples are received at the laboratory. The laboratory will maintain custody of bottles and samples using their normal custody procedures.

Samples must be in the sampler's possession or in a cooler sealed with signed and dated friable evidence tape on opposing sides of the cooler. When the cooler is sealed, the method of securing the samples must be such that tampering with samples or bottles is not possible. The cooler must be secured so that the lid cannot be removed without breaking the evidence tape.

Transfer of samples will be accomplished using the laboratory's Chain-of-Custody (COC) form. When samples are transferred between personnel, such transfers will be indicated on the COC form with signature, date, and time of transfer. The COC will remain with the samples, sealed inside the cooler, until received by the laboratory. DEC will provide a copy of the contracted lab COC for staff to use during fieldwork.

If custody is broken at any time during sample transfer, a note must be made on the COC form accompanying the sample. Upon receipt at the laboratory, the laboratory sample custodian will make note if a breach of custody has occurred (for example, if a custody seal has broken during transport).

B.3.2 Shipping Requirements

Packaging, marking, labeling, and shipping of samples will comply with all regulations promulgated by the U. S. Department of Transportation in 49 CFR 171-177. Staff should receive the necessary training for shipping samples or consult with the contracted laboratory for shipping instructions.

Samples collected in plastic bottles may be placed in the cooler with sufficient padding (e.g., bubble wrap, cardboard, etc.) to limit movement of the bottles in the cooler during transport. The sealed plastic bags and plastic sample bottles will be placed into a cooler with gel-ice/blue-ice in plastic bags to maintain a temperature of <10 °C. A temperature blank, 250 or 500 mL in size, will be placed in the cooler. Temperature will be measured upon receipt at the lab. The chain of custody (COC) form will be placed in a plastic bag within the cooler. The cooler will be taped closed securely using packing tape at the last sampling site. If the cooler is being transported by the field crew members directly to the laboratory, tape is not mandatory.

Table 10. Sample Transport and Lab Information

Transport	Name	Address	Hours	Contact Information	Estimated Transit Time
Deliver directly to flight	Alaska Seaplanes	Alaska Seaplanes Haines, 3.5 mile, Haines Rd, Haines, AK 99827	Flight 406 11:50 daily through 5/22/25 Flight 406 12:20 daily through 8/25/23 Flight 406 11:05 through 9/1/23	(907) 766 - 3800	35 minutes
DEC/Lab couriers deliver to lab	Admiralty Environmental Lab	641 Willoughby Ave. Suite 301 Juneau, AK 99801	8:00 – 17:00 last sample drop off without additional charge at 15:30	(907) 463 - 4415	30 minutes
Ship FedEx First Overnight (no preservation kit) or regular	LuminUltra (MST samples only)	805 Pinnacle Dr. Suite M Linthicum Heights, MD 21090		(506) 459 - 8777	48 hours or 3 weeks if using preservation kit

shipping (preservation kit used)					

B.4 Analytical Methods and Requirements

Water quality analytical methods that will be used throughout this project are outlined below. All analysis methods used for this program are EPA-approved. The contracted laboratory will be a DEC Drinking Water certified laboratory, though the lab will be using methods specified for water/wastewater analysis. The contracted laboratory's current Quality Assurance Plan will be on file with DEC Division of Water Quality Assurance Office detailing their quality assurance procedures. Laboratory turnaround time is 36 hours. Any issues regarding analytical data quality will be resolved by the DEC project manager in consultation with any or all of the following: DEC QA Officer, sampling staff and the laboratory project manager.

B.4.1 Measurement and Sampling Parameters

- **Temperature** will be reported in °C for air and water and will be measured using a Hanna handheld meter or an equivalent meter (minimum resolution of 0.1 degree C or better). The thermometer will have current NIST traceable certification.
- **Turbidity** will be measured in situ using a Hach 2100Q Turbidimeter.
- **pH** will be measured using a Hanna handheld meter or an equivalent meter (YSI). Stream water pH is a measure of hydrogen ion activity.
- **Fecal Coliform** Standard Method 9222D will be used to determine the fecal coliform concentration in surface water. Filter sample through a membrane filter. Place membrane on mFC agar containing aniline blue as indicator. Incubate at 44.5°C for 22-24 h. Colonies that are various shades of blue are positive for fecal coliforms. The blue color indicates the capability to ferment lactose to acid.
- **Enterococci** ASTM Method D6503-99 will be used to determine the most probable number enterococci concentration in surface water. Add reagent to the sample, pour into Quanti-Tray® or Quanti-Tray® /2000, seal in Quanti-Tray® Sealer and incubated for 24 hours at 41°C. Count fluorescent wells and refer to most probable number table.
- **Microbial Source Tracking** Detection and quantification of the fecal host associated gene biomarker by quantitative Polymerase Chain Reaction (qPCR) DNA analytical technology. Host markers may include Human HF183, Canine BacCan and Avian GFD.

Monitoring shall be conducted in accordance with EPA-approved analytical procedures and in compliance with 40 CFR Part 136, Guidelines Establishing Test Procedures for Analysis of Pollutants. Reference the Project's MQO Table 5 (section A.6.2) of this QAPP for list of parameters of concern, approved analytical methods, method-specific detection and reporting limits, accuracy and precision values applicable to this project. 40 CFR, Part 136.6 lists other regulated pollutant parameters not listed in the MQO Table 5 (section A.6.2).

An expedited reporting turnaround time after sampling will be required for laboratory enterococcus analyses to obtain results quickly for decision-making purposes. As pathogen exposure remains a risk

to beach users during the period between sample analysis and reporting sample results, a short reporting time is recommended; a period of 36 hours following sample submission should be used for reporting results to the QAO, the BPM, and local community point of contact.

B.5 Quality Control Requirements

Table 5 lists the relative percent difference of field and laboratory replicates to be used for quality control (see section A.6.2 for discussion on calculation of precision and accuracy). The precision of field and laboratory measures will be calculated using the equation in section A.6.2. Data measurements that do not meet the limits described in A.6.2 may or may not be used in the final report depending on the degree to which limits are not met. However, the report will clearly flag all data of questionable value along with a brief description of the problem and any justification for why data should be considered for use. Beach Sanitary Survey 123 will make up the main documentation for field activities. As soon after collection as possible, Beach Sanitary Survey 123, and chain-of-custody forms will be scanned to create an electronic record. Field data will be hand-entered or electronically transferred into the database.

An example Data Management Flow Chart (Figure 2) provides a visual summary description of the data flow/management process for environmental data collected in support of DEC's Division of Water decision making processes. Revisions may be made as appropriate for the monitoring project.

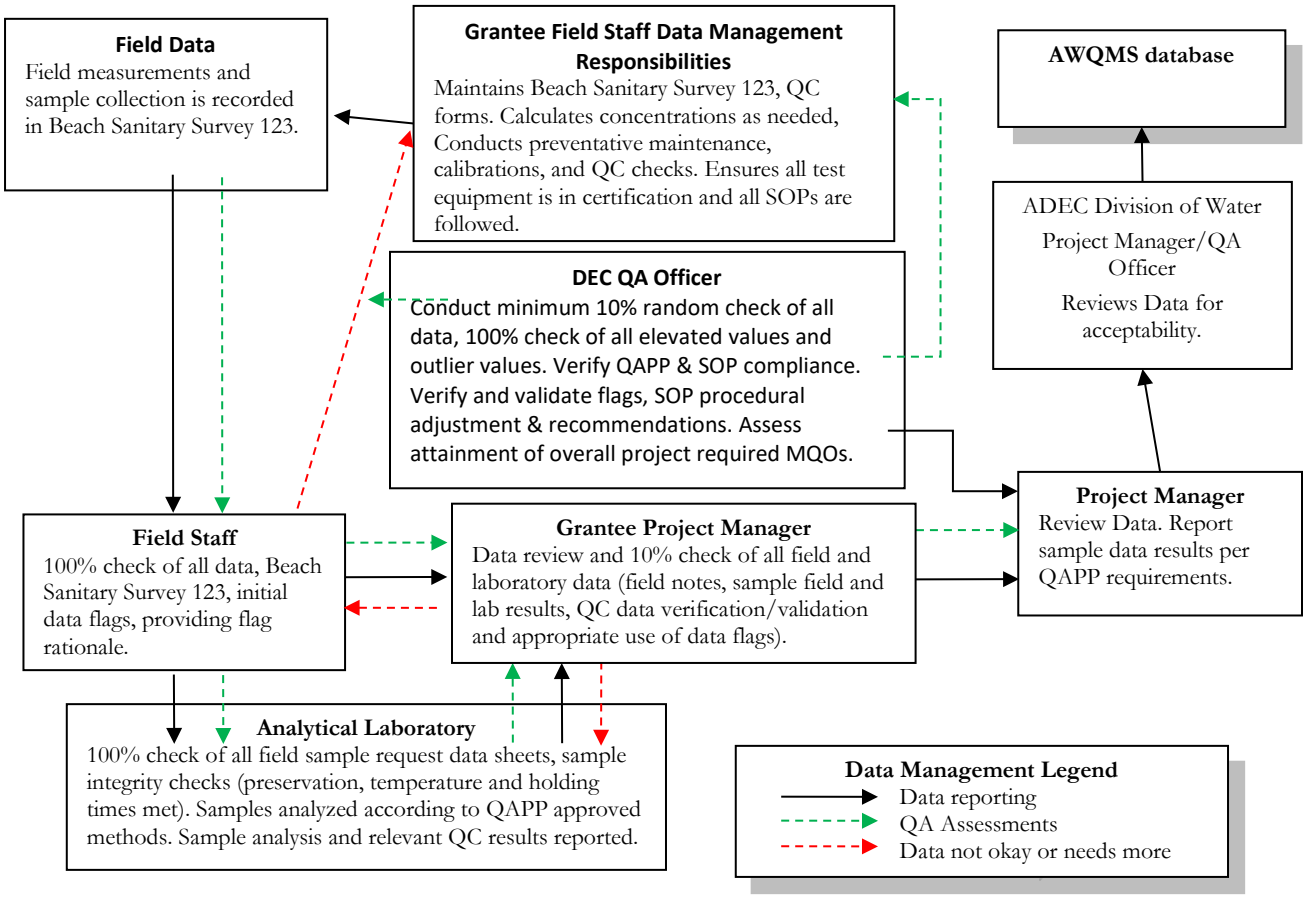


Figure 2. Data Management Flow Cart

One field sample replicate (i.e., duplicate) will be collected once each sampling event, at alternating sample locations, for both fecal coliform and enterococci bacteria. The purpose of field sample replicate is to assess sampling and laboratory precision for the monitoring project.

For laboratory analyses, contract laboratories will submit quality control results along with sample analytical results. Laboratory Quality Control will include duplicates, holding times, sample temperatures upon receipt of sample at lab and blanks. Laboratory precision criteria should be within MQO criteria provided in Section A.6.

B.5.1 Field Quality Control

Quality control activities in the field will include adherence to documented procedures and comprehensive documentation of sample collection information included in the field survey (electronic or paper). A rigidly enforced chain-of-custody program will ensure sample integrity and identification. The chain-of-custody procedure documents the handling of each sample from the time the sample was collected to the arrival of the sample at the laboratory.

Quality Control measures in the field include but are not limited to.

- Proper handling of sampling equipment.
- Maintenance, cleaning, and calibration of field equipment/ kits per the manufacturers and/or laboratory's specifications, and field Standard Operating Procedures (SOPs).
- Chemical reagents and standard reference materials are used prior to expiration dates.
- Proper field sample collection and analysis techniques, including but not limited to: Utilization of clean hands, dirty hands techniques; use of powder free nitrile gloves.
- Ensuring all sample equipment and sample containers are in proper condition (i.e., no cracks or broken bottle caps, tamperproof seals are intact before sampling).
- Correct sample labeling and data entry.
- Proper sample handling and shipping/transport techniques, including the use of a temperature blank in each cooler containing samples to be shipped.
- Field replicate measurements at a minimum of one sample for each analyte per sampling event.

Analytical methods used on the project have been approved and documented by EPA, Standard Methods, or ASTM. These methods will be used as project-specific protocols to document and guide analytical procedures. Adherence to these documented procedures will ensure that analytical results are properly obtained and reported.

B.5.2 Laboratory Quality Control (QC) Measures

Contracted and sub-contracted laboratories will follow the testing, inspection, maintenance, and quality control procedures required by EPA Clean Water Act approved methods and as stated in the respective laboratories' QAP and SOPs including the following.

Laboratories detail QC procedures used in their laboratory Quality Assurance Plan and method specific SOPs Quality Control in laboratories includes the following.

- Laboratory instrumentation calibrated with the analytical procedure.
- Laboratory instrumentation maintained in accordance with the instrument manufacturer's specifications, the laboratory's QAP and Standard Operating Procedures (SOPs).
- Specific QC activities prescribed in the project's QAPP.
- Laboratory data verification and validation prior to sending data results to DEC.

Contracted and sub-contracted laboratories will provide analytical results after verification and validation by the laboratory QA Officer. The laboratory must provide all relevant QC information with its summary of data results so that the DEC Project Manager and QA Officer can perform field data verification and validation and review the laboratory reports. The DEC Project Manager reviews this data to ensure that the required QC measurement criteria have been met. If a QC concern is identified in the review process, the DEC Project Manager and QA Officer will seek additional information from the sub-contracted laboratory to resolve the issue and take appropriate corrective action(s).

B.5.3 QA Reports to Management

Following field and laboratory quality control measurements, quality analysis reports will be filed with the DEC and/or Grantee Project Manager. Table 11 details the report requirements for submittal to the DEC and/or Grantee Project Manager.

Table 11. Quality Assurance Reports to Management

QA Report Type	Contents	Presentation Method	Report Issued by	Reporting Frequency	
				As Required	Annual
On-site Field Inspection Audit Report	Description of audit results, audit methods and standards/ equipment used and any recommendations	Checklist or written text and tables, charts, graphs displaying results	Grantee Project Manager or QA Officer/ DEC Project Manager	✔	
Corrective Action Recommendation	Description of problem(s); recommended action(s) required; time frame for feedback on resolution of problem(s)	Written text/table	Grantee Project Manager or QA Officer/ DEC Project Manager	✔	
Response to Corrective Action Report	Description of problem(s), description/date corrective action(s) implemented and/or scheduled to be implemented	Written text/table	Grantee Project Manager or QA Officer overseeing sampling and analysis	✔	
Data Quality Audit	Independent review and recalculation of sample collection/analysis (including calculations, etc.) to determine sample result. Summary of data audit results; findings; and any recommendations	Written text and charts, graphs displaying results	Grantee QA Officer	✔	
Quality Assurance Report to Management	Project executive summary: data completeness, precision, bias/ accuracy	Written text and charts, graphs displaying results	Grantee QA Officer	✔	✔

B.6 Instrument Calibration and Frequency

Field instruments shall be calibrated prior to using the instruments. The Grantee Subcontractor Lead Field Sampler will ensure that instruments are calibrated correctly, and appropriate documents recorded and retained. Sensors for field equipment (i.e., air and water temperature) will be replaced according to manufacturers' recommendations. If abnormal readings occur, the manufacturer will be contacted for assistance or replacement of field equipment.

Contracted and sub-contracted laboratories will follow the calibration procedures found in its QAP and the laboratory's Standard Operating Procedures (SOPs). Specific calibration procedures for regulated

pollutants will agree with the respective "EPA Approved" Clean Water Act Pollutant methods of analysis. Field and/or Laboratory calibration records will be made available to DEC upon request.

B.7 Inspection/Acceptance of Supplies and Consumables

Pre-cleaned sample containers will be obtained from the lab with the appropriate preservation method included. Coolers, gel ice, temperature blanks, and chain-of-custody forms will be provided by the contract laboratory prior to field mobilization. Qualified grantee staff will check all field equipment and supplies to ensure that their technical specifications have been met before use. Any deviances during inspection procedures will be remedied by the grantee staff and recorded in the electronic or paper field data sheets. If re-sampling becomes necessary, replacements will be made.

No standards, solutions, buffers, or other chemical additives will be used if the expiration date has passed. It is the responsibility of the grantee lead sampler or his/her designee to keep appropriate records, such as logbook entries or field data sheets, to verify the inspection/acceptance of supplies and consumables and restock these supplies and consumables when necessary.

Contracted and sub-contracted laboratories will follow procedures in their laboratory's QAP and SOPs for inspection/acceptance of supplies and consumables.

B.8 Data Acquisition Requirements (Non-Direct Measurements)

Topographic non-direct measurements (e.g., maps, charts) will be conducted using USGS derived materials. All geographical materials will be listed according to their source, year, and scale. GPS information will be documented by including collection device make and model number, geographic coordinate system, degree of accuracy (minimum of three satellite signals), and calibration information. GIS information will include GIS software program and model, source information, and geographic coordinate system.

B.9 Data Management

Various people are responsible for separate or discrete parts of the data management process.

The grantee field samplers are responsible for field measurements/sample collection and recording of data and subsequent shipment of samples to laboratories for analyses. They assemble data files, which include raw data, calibration information and certificates, QC checks (routine checks), data flags, sampler comments and metadata where available. These files are assembled and forwarded for secondary data review by the Grantee Project Manager.

Laboratories are responsible for complying with the data quality objectives specified in the QAPP and as specified in the laboratory QAP and method specific SOPs. Validated sample laboratory data results are reported to the Grantee Lead Field Sampler and Project Manager.

Secondary reviewers (DEC Beach Project Manager and Program Manager) are responsible for the QC the review, verification and validation of field and laboratory data and data reformatting as appropriate for reporting to AWQMS and reporting validated data to the DEC Project Manager.

The Grantee QA officer is responsible for performing routine independent reviews of data to ensure the monitoring projects data quality objectives are being met. Findings and recommended corrective actions (as appropriate) are reported directly to project management.

The DEC and Grantee Project Managers are responsible for final data certification.

DEC Beach Program Manager and QA Officer conducts a final review (tertiary review) and submits the validated data to AWQMS.

Daily field records (a combination of field and core logbooks data sheets) will make up the main documentation for field activities. As soon after collection as possible, field notes, data sheets, core logs, and chain-of-custody forms will be scanned to create an electronic record. Field data will be hand-entered or electronically transferred onto excel workbooks to be submitted into the database. One hundred percent of the transferred data will be verified based on hard copy records. Electronic QA checks to identify anomalous values will also be conducted following entry.

Data obtained during sampling activities will be entered into field data sheets and/or notebooks.

The following is a list of data information that will be kept and submitted to DEC.

- Field equipment and chemicals maintenance, cleaning, and calibration records
- Beach Sanitary Survey 123
- Photographs of sampling stations and events
- Chain-of-Custody forms
- Laboratory equipment maintenance, cleaning, and calibration records
- Laboratory bench sheets, control charts, and SOPs
- Records of QA/QC problems and corrective actions (field and/or laboratory)
- Laboratory data QC records
- Records of data review sheets
- Replicate, performance evaluation records and other QA/QC control records (field and laboratory)
- Data review, verification, and validation records

Sample Numbering

All samples will be assigned a unique identification code based on a sample designation scheme designed to suit the needs of the field personnel, data management, and data users. Sample identifiers will consist of two components separated by a dash. The first component is used to identify the area to which the sample originated, for example: Haines-LutakInlet.

Laboratory Data

The contract laboratory will submit data in electronic format to DEC. Written documentation will be used to clarify how field replicates and laboratory duplicates and QA/QC samples were recorded in the

data meta tables and to provide explanations of other issues that may arise. The data management task will include keeping accurate records of field and laboratory QA/QC samples so that DEC Project Managers and technical staff who use the data will have appropriate documentation. Data management files will be stored on a secure computer or on a removable hard drive that can be secured. All records will be retained by the contract laboratory for five years.

Data Storage and Retention

Data management files will be stored on a secure computer or on a removable hard drive that can be secured. Laboratory Records will be retained by the contract laboratory for a minimum of five years. Project records will be retained by the lead organization conducting the monitoring operations for a minimum of five years, preferably longer. Site location and retention period for the stored data will be specified in each QAPP.

C. Assessment and Oversight

C.1 Assessment and Response Actions

Assessment audits are independent evaluations of the monitoring project that are performed by the DEC Project Manager and /or QA Officer or his/her designee. These audits may include (but are not limited to) any of the following: on-site field surveillance, on-site laboratory audits, performance evaluation samples, blind sample duplicates/ replicates (precision samples), field split samples, data quality audits, and/or data reviews. The number and types of assessments are dependent upon the monitoring project's intended data uses.

C.1.1 On-Site Assessments To Be Performed

- One on-site field audit will be completed to evaluate sampling protocols and survey techniques. Audits will evaluate whether procedures used for sample collection, preservation, shipping and hold times, and sample receipt at lab follow QAPP requirements.

C.1.2 Project Data Assessments

- Audits of Monitoring Data for reproducibility of results from recalculation/reconstruction of field/lab data.
- Calculation of monitoring project's overall achieved precision, accuracy, and data completeness compared to QAPP defined precision, accuracy, and data completeness goals. Method specific precision, accuracy, and data completeness criteria are specified in Project MQO Table 5 of section A.6.2.
- Complete the data review checklist. Describes whether project data quality objectives and measurement quality objectives were obtained, and corrective actions that were taken if any.
- Water Quality Field Report will be completed at the end of the project. Summarizes project methods and results and whether exceedances of Alaska's Water Quality Standards were measured.

D. References

ADEC (Alaska Department of Environmental Conservation). 2025. Haines BEACH Monitoring Handbook. Water Quality, Division of Water. Juneau, AK.

ADEC (Alaska Department of Environmental Conservation). 2025. 18 AAC 70. Water Quality Standards. 65 pg.

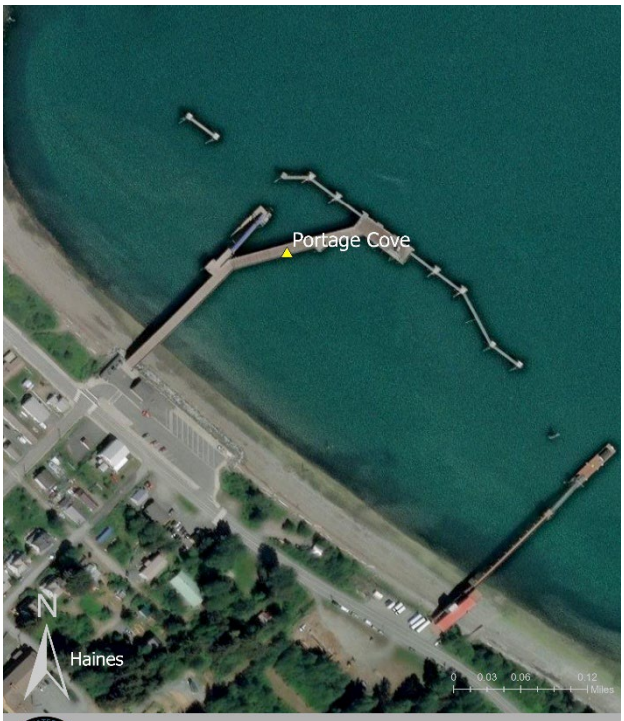
Bureau of Land Management. 2017. AIM National Aquatic Monitoring Framework: Field Protocol for Wadeable Lotic Systems. Tech Ref 1735-2. U.S. Department of the Interior, Bureau of Land Management, National Operations Center, Denver, CO.

USEPA (U.S. Environmental Protection Agency). 2013. Great Lakes Beach Sanitary Survey User Manual. EPA-823-B-06-001. U.S. Environmental Protection Agency, Office of Water. Washington, DC

USEPA (U.S. Environmental Protection Agency). 2014. National Beach Guidance and Required Performance Criteria for Grant, 2014 Edition. EPA-823-B-14-001. U.S. Environmental Protection Agency, Office of Water. Washington, DC.

Appendix A: Sample Site Locations

Pyramid Island Sampling Location



Portage Cove Sampling Location

Lutak Inlet Sampling Location

Appendix B: Standard Operating Procedure for Ambient Water Collection for Pathogen Monitoring

B.1 Standard Operating Procedures Alaska BEACH Program

Sampling for the Alaska BEACH Program involves wading into the water adjacent to a beach commonly used for recreation to collect water from below the surface into sample jars. The sample should be collected in the general recreational beach area, or near locations expected to be influenced by fecal contamination (e.g., adjacent to sewage lagoons, near small boat harbors, etc.). Field staff will have completed sampling after the following steps have been accomplished:

- Each sample jar is filled with water,
- Each sample jar is labeled,
- Each sample jar is placed in a cooler kept chilled with artificial ice,
- The Beach Sampling Data Sheet is filled out,
- A chain-of-custody form is filled out,
- The cooler is transported to the laboratory responsible for determining fecal coliform and enterococcus populations,
- A copy of the Beach Sampling Data Sheet is sent to the respective DEC Project Manager, and a copy of the Beach sampling Data Sheet is kept by the Grantee Project Manager.

Detailed directions for collecting good water samples, shipping the samples to the laboratory, and providing beach assessment information to DEC are given in the following subsections.

B.1.2 Sample Collection Method

A good water sample is collected by avoiding cross-contamination, which can happen when the sampler inadvertently contaminates the sample. To reduce the potential for cross-contamination the sampler must follow a standard sample-collection method. Step-by-step sample-collection instructions are provided below:

1. Request a sample kit from the laboratory. The kit should include the following.
    - A cooler
    - The appropriate sample containers for marine water quality sampling (enterococcus and fecal coliform bacteria)
    - Artificial ice to keep the cooler chilled to the appropriate temperature
    - The appropriate container for the duplicate sample
    - Temperature blank
    - Chain-of custody form

- Custody seals
- Sample jar labels
- An extra set of Sample bottles
- An extra set of sample bottles for a duplicate sample
- Shipping labels
- Packing material

2. **Call the laboratory prior to sampling** to make sure there will be someone at the laboratory to receive and process the samples within 6 hours of sampling.
3. **Consult flight schedules** to make sure there will be a flight that can get the samples to the laboratory within 6 hours of sampling.
4. **Verify/Calibrate** equipment to be used for in situ measurements.
5. Write the beach sampling location on the bottle label and Beach Sampling Data Sheet.
6. Put on clean waders and gloves. Wade into the water to a depth of approximately 3 feet. Try to avoid kicking up sediment or wait until any sediment that has been kicked up settles. Stand downstream of the water current and wait for sediment to clear.
7. Remove the bottle cap just before collecting the sample. Protect the cap from contamination. Do not touch the inside of the bottle, or the inside of the cap.
8. Open the sampling bottle and hold onto the base with one hand. Plunge the top of the bottle downward into the water. Avoid introducing surface scum. Point the mouth of the bottle into the current. Hold the bottle about 1 foot below the water surface and tip it slightly upward to allow air to exit and the bottle to fill.
9. Remove the bottle from the water. Pour out a little water to leave the airspace at the top of the jar. Fill two 250-mL bottles at each sampling location.
10. Tightly close each bottle.
11. Collect in situ field measurements using a handheld probe or similar. Collect in situ samples immediately after collecting grab samples. Face upstream or into the current, allow any disturbed sediment to settle before submerging the probe to the manufacturer's suggested depth. Swirl the probe gently to allow good contact with the sensors. Wait for numbers to stabilize. Record results on field datasheets. Note that handheld probes must be calibrated prior to use in the field.

Collect one replicate sample for each bacteria analytical test per sampling event for quality assurance. To collect a replicate sample, you must first have requested extra jars from the laboratory. Repeat Steps 2 through 8 at the same location.

1. Complete bottle labels and attach them to each sample jar; some sample jar labeling can be done prior to sample collection. The labels should be clean, waterproof, non-smearing, and large enough for all the information. Information on the label should include the following.

- Sample identifier (e.g., “site name-date-sample” = “Haines-LutakInlet-05152025”)
- Sample location (e.g., beach name)
- Sampling date and time
- Name of sampler

2. Wash your hands and arms with soap and water or waterless antimicrobial cleanser, or disinfectant lotion to reduce exposure to potentially harmful bacteria or microorganisms.

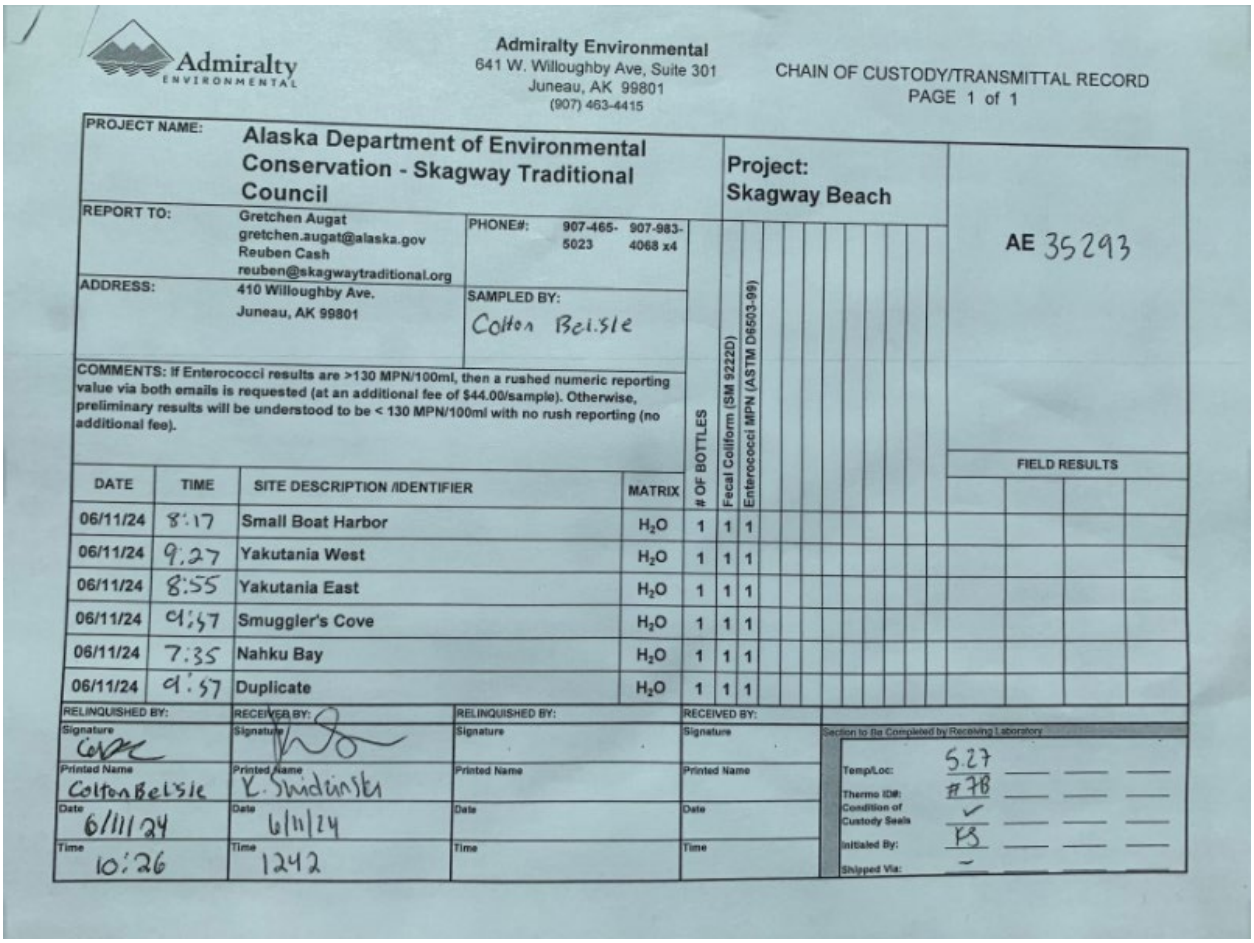
B.1.3 Sample Handling

Sample handling involves packing the samples in a cooler and shipping them to the laboratory. After sample collection is complete the samples must be handled with care so that they arrive at the laboratory in good condition. Step-by-step sample handling instructions are provided below.

3. Place the sample(s) in a pre-chilled cooler containing artificial ice to maintain a temperature from 1° to 10°C. Ask the laboratory ahead of time how much ice will be needed. Do not allow the samples to freeze.
4. Place enough packing material inside the cooler to protect the sample jars from breaking during transport to the laboratory.
5. Complete the chain-of-custody form. Put the form in a plastic bag and tape it to the inside of the cooler lid.
6. Write a note in the “Special Instructions” box requesting that the laboratory results be sent without delay (within 36 hours of sampling) to two people: the DEC Project Manager, the Grantee Project Manager. Only enterococcus testing will be expedited for immediate posting for the community.
7. Fill out two custody seals and attach one to the front an one to the back of the cooler to span the lid seam. You want them to tear them when the cooler is opened.
8. Securely tape the cooler shut prior to shipment. Attach shipping labels that identify the shipping destination and say: “keep cool,” “do not freeze,” and “fragile.”
9. Ship the samples to (Laboratory Name and Phone Number).

Remember that samples must be collected, shipped, and received by the laboratory in 6 hours. Samples that exceed the 6-hour holding time may not be analyzed. Consult flight schedules and call the laboratory prior to sampling to make sure there will be a flight that can get the samples to the laboratory within 6 hours of sampling, and that there will be someone at the laboratory to receive the samples.

C. Appendix C: Example Chain of Custody Form



Admiralty ENVIRONMENTAL

Admiralty Environmental
641 W. Willoughby Ave, Suite 301
Juneau, AK 99801
(907) 463-4415

CHAIN OF CUSTODY/TRANSMITTAL RECORD
PAGE 1 of 1

PROJECT NAME: Alaska Department of Environmental Conservation - Skagway Traditional Council

Project: Skagway Beach

AE 35293

REPORT TO: Gretchen Augat gretchen.augat@alaska.gov Reuben Cash reuben@skagwaytraditional.org

PHONE#: 907-465-5023 907-983-4068 x4

ADDRESS: 410 Willoughby Ave. Juneau, AK 99801

SAMPLED BY: Colton Belisle

COMMENTS: If Enterococci results are >130 MPN/100ml, then a rushed numeric reporting value via both emails is requested (at an additional fee of $44.00/sample). Otherwise, preliminary results will be understood to be < 130 MPN/100ml with no rush reporting (no additional fee).

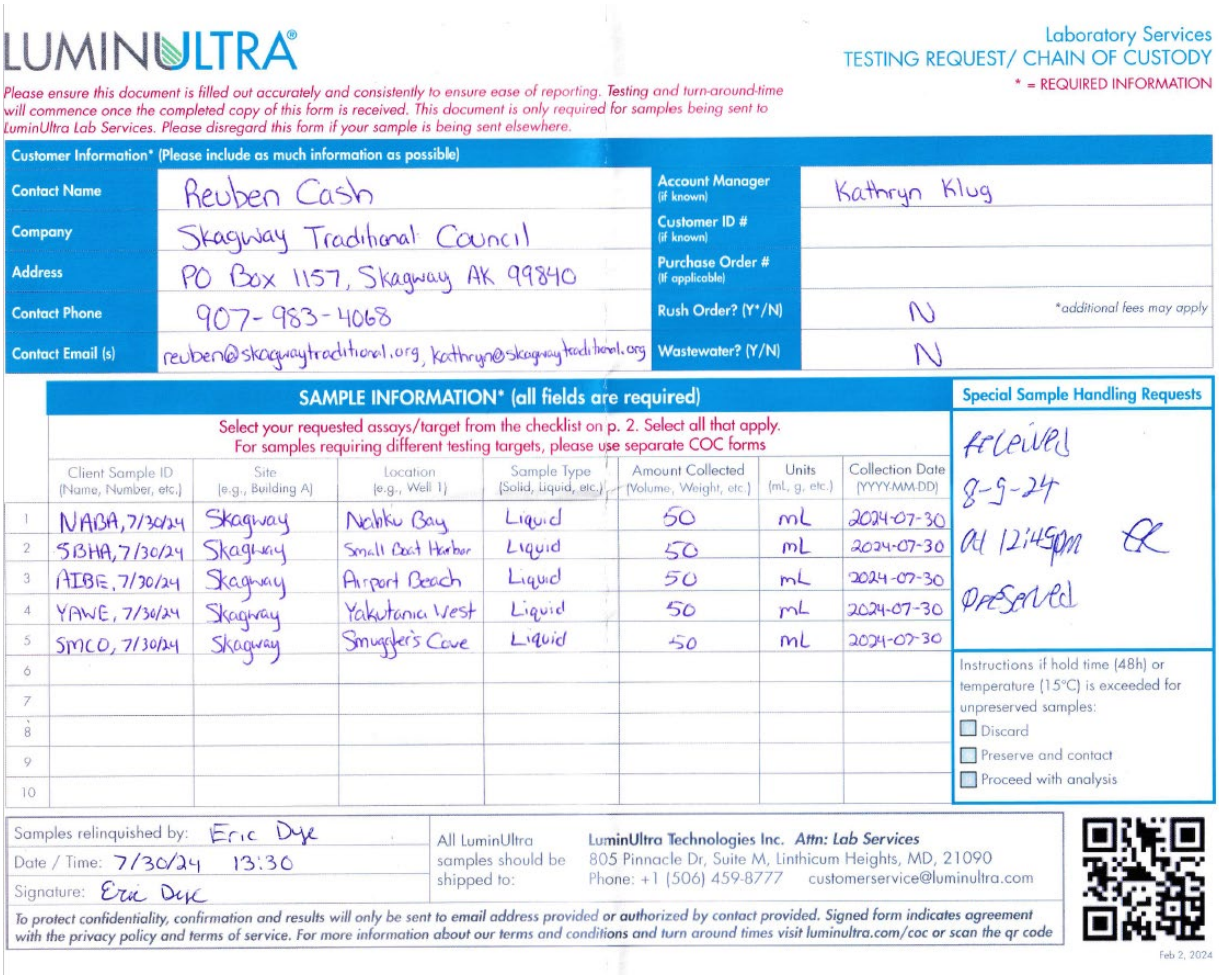
DATE	TIME	SITE DESCRIPTION /IDENTIFIER	MATRIX	# OF BOTTLES	Fecal Coliform (SM 9222D)	Enterococci MPN (ASTM D6503-99)	FIELD RESULTS
06/11/24	8:17	Small Boat Harbor	H_2O	1	1	1	
06/11/24	9:27	Yakutania West	H_2O	1	1	1	
06/11/24	8:55	Yakutania East	H_2O	1	1	1	
06/11/24	9:47	Smuggler's Cove	H_2O	1	1	1	
06/11/24	7:35	Nahku Bay	H_2O	1	1	1	
06/11/24	9:57	Duplicate	H_2O	1	1	1	

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: Colton Belisle	Signature: K. Smidinski	Signature	Signature
Printed Name: Colton Belisle	Printed Name: K. Smidinski	Printed Name	Printed Name
Date: 6/11/24	Date: 6/11/24	Date	Date
Time: 10:26	Time: 1242	Time	Time

Section to Be Completed by Receiving Laboratory

Temp/Loc: 5.27
Thermo ID#: #78
Condition of Custody Seals: ✓
Initialed By: KB
Shipped Via: –

Figure C. 1. Example Chain of Custody form.



LUMINULTRA®

Laboratory Services
TESTING REQUEST/ CHAIN OF CUSTODY
* = REQUIRED INFORMATION

Please ensure this document is filled out accurately and consistently to ensure ease of reporting. Testing and turn-around-time will commence once the completed copy of this form is received. This document is only required for samples being sent to LuminUltra Lab Services. Please disregard this form if your sample is being sent elsewhere.

Customer Information* (Please include as much information as possible)

Contact Name	Reuben Cash	Account Manager (if known)	Kathryn Klug
Company	Skagway Traditional Council	Customer ID # (if known)	
Address	PO Box 1157, Skagway AK 99840	Purchase Order # (If applicable)	
Contact Phone	907-983-4068	Rush Order? (Y*/N)	N *additional fees may apply
Contact Email (s)	reuben@skagwaytraditional.org, kathryn@skagwaytraditional.org	Wastewater? (Y/N)	N

SAMPLE INFORMATION* (all fields are required)

Select your requested assays/target from the checklist on p. 2. Select all that apply.
For samples requiring different testing targets, please use separate COC forms

	Client Sample ID (Name, Number, etc.)	Site (e.g., Building A)	Location (e.g., Well 1)	Sample Type (Solid, Liquid, etc.)	Amount Collected (Volume, Weight, etc.)	Units (mL, g, etc.)	Collection Date (YYYY-MM-DD)
1	NABA, 7/30/24	Skagway	Nahku Bay	Liquid	50	mL	2024-07-30
2	SBHA, 7/30/24	Skagway	Small Boat Harbor	Liquid	50	mL	2024-07-30
3	AIBE, 7/30/24	Skagway	Airport Beach	Liquid	50	mL	2024-07-30
4	YAWE, 7/30/24	Skagway	Yakutania West	Liquid	50	mL	2024-07-30
5	SMCO, 7/30/24	Skagway	Smuggler's Cove	Liquid	50	mL	2024-07-30
6							
7							
8							
9							
10							

Special Sample Handling Requests

Received
8-9-24
at 12:45pm
Preserved

Instructions if hold time (48h) or temperature (15°C) is exceeded for unpreserved samples:
- ☐ Discard
- ☐ Preserve and contact
- ☐ Proceed with analysis

Samples relinquished by: Eric Dyke
Date / Time: 7/30/24 13:30
Signature: Eric Dyke

All LuminUltra samples should be shipped to:

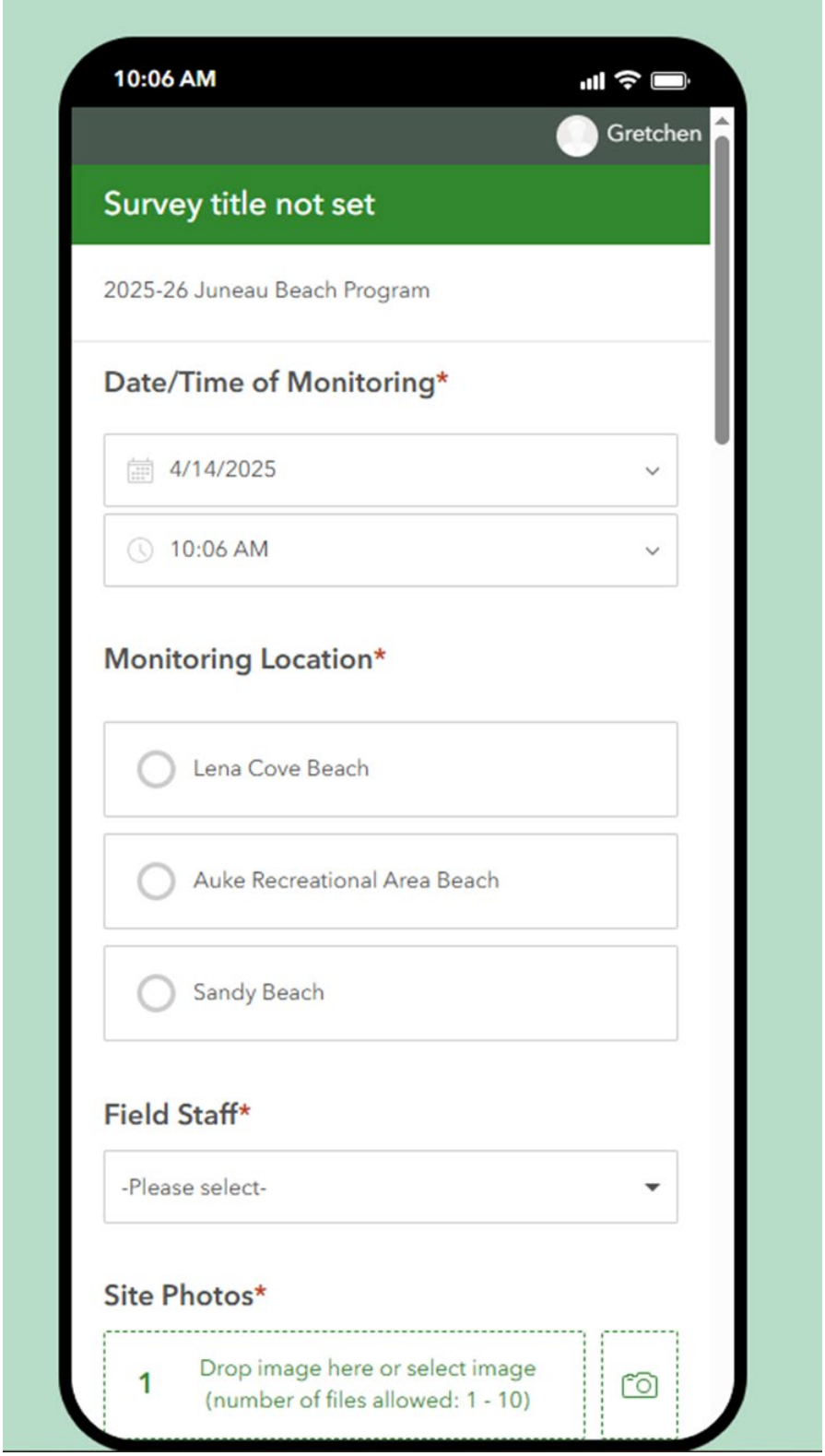
LuminUltra Technologies Inc. *Attn: Lab Services*
805 Pinnacle Dr, Suite M, Linthicum Heights, MD, 21090
Phone: +1 (506) 459-8777 customerservice@luminultra.com

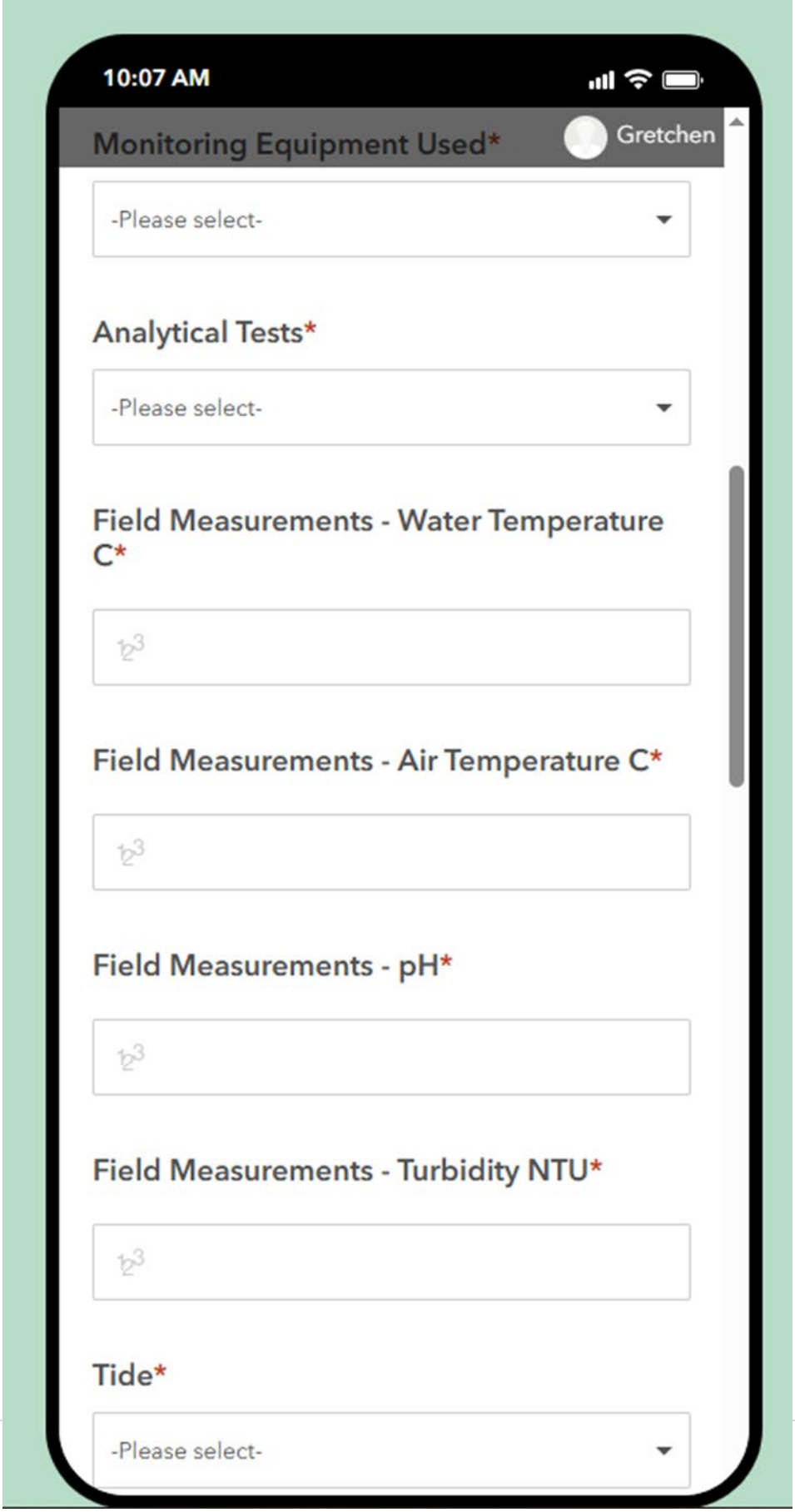
To protect confidentiality, confirmation and results will only be sent to email address provided or authorized by contact provided. Signed form indicates agreement with the privacy policy and terms of service. For more information about our terms and conditions and turn around times visit luminultra.com/coc or scan the qr code

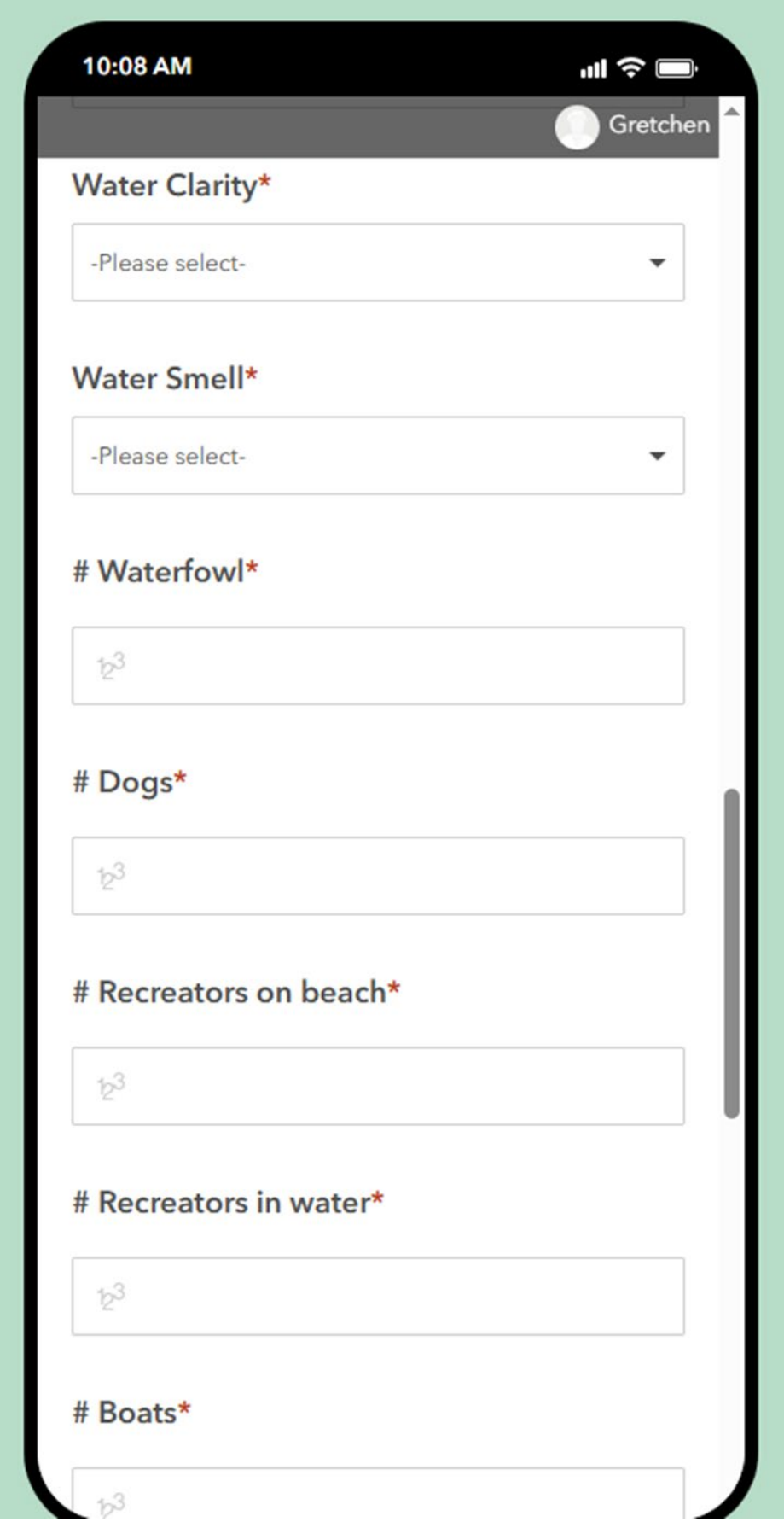
Feb 2, 2024

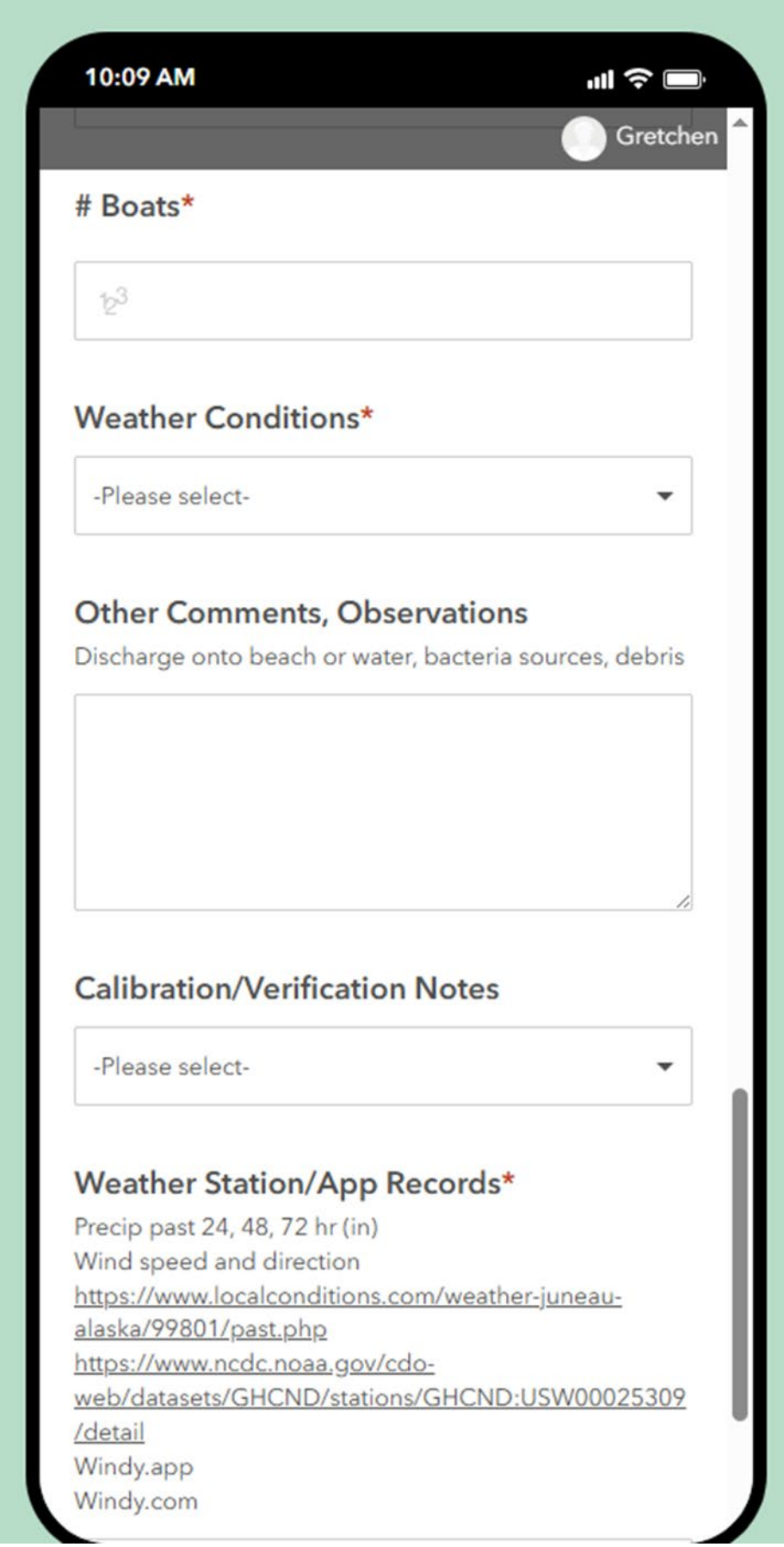
Figure C. 1. Example Chain of Custody form.

D. Appendix D: Site-Specific Beach Sanitary Survey 123




10:07 AM
Monitoring Equipment Used*
Gretchen
-Please select-
Analytical Tests*
-Please select-
Field Measurements - Water Temperature C*
Field Measurements - Air Temperature C*
Field Measurements - pH*
Field Measurements - Turbidity NTU*
Tide*
-Please select-


10:08 AM
Gretchen
Water Clarity*
-Please select-
Water Smell*
-Please select-
Waterfowl*
Dogs*
Recreators on beach*
Recreators in water*
Boats*


10:09 AM
Gretchen
Boats*
123
Weather Conditions*
-Please select-
Other Comments, Observations
Discharge onto beach or water, bacteria sources, debris
Calibration/Verification Notes
-Please select-
Weather Station/App Records*
Precip past 24, 48, 72 hr (in)
Wind speed and direction
https://www.localconditions.com/weather-juneau-alaska/99801/past.php
https://www.ncdc.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:USW00025309/detail
Windy.app
Windy.com

Date/Time of Monitoring*

5/31/2024

02:06 PM

Monitoring Location Name

VanCr-1 | VanCr-2 | VanCr-3

DEC Field Staff

-Please select-

Site Photos

Take photos in this order: upstream, downstream, banks, and of interest.


site_photos-20240531-220609.jpg 3.4MB


site_photos-20240531-220633.jpg 3.4MB


site_photos-20240531-220646.jpg 3.8MB


site_photos-20240531-220653.jpg 2.9MB

5 Drop image here or select image (number of files allowed: 1 - 10)

Monitoring Equipment Used

Aqua Troll 500

Equipment Serial Number

659601

Air Temperature (F)

61

Weather Conditions

Cloudy

Water Clarity

Other

Slightly turbid

Water Smell

Septic

Water Level

Other

Below average

Wildlife, Debris, Observations

Birds, Eagles, Ravens. Reading taken at 2:08. Usually not turbid at this site when background clear; potential upstream influences?

869

Calibration/Verification Notes

Verification passed

Discharge into water

No turbid discharge from DOT GI trench

Weather Station/App Records (Past 24 hr in inches)

0.003

Wind Speed/Direction

12 ene

E: Microbial Source Tracking (MST) Sampling for Analysis by LuminUltra Technologies

Purpose

This standard operating procedure (SOP) outlines the procedures for collecting and filtering (optional) water samples and shipping them to the laboratory for Microbial Source Tracking (MST) analysis by quantitative polymerase chain reaction (qPCR). MST provides insight into potential animal sources of bacteria in surface waters. Specifically, this SOP follows procedures recommended by LuminUltra Technologies for filtering using their preservation qKit and sample analyses by their labs. DEC neither requires nor endorses exclusive use of LuminUltra laboratories, and other labs may have different recommendations, equipment, and procedures.

Quick Links

Collecting Water Sample by Hand

Collecting Water Sample by Hand

If collecting water samples using a dipper pole, see Section 2.

Write the sampling location, date, time, and site ID on the bottle label and place label on bottle. Cover with tape.

Put on clean gloves.

Wade into the stream to no deeper than three feet. Try to avoid kicking up sediment or wait until any sediment that has been kicked up settles. Face upstream and wait for sediment to clear.

Rinse the bottle by placing the bottle roughly six inches below the surface of the water and uncap it. Point the mouth of the bottle into the current. Hold the bottle about six inches below the water surface and tip it slightly upward to allow air to exit and the bottle to fill to shoulder. Discard water downstream. Repeat twice more for a total of three rinses. If using sterile bottles, there is no need to rinse.

Place the bottle upstream roughly six inches underwater and fill the bottle once more. Cap the bottle underwater.

Repeat for additional bottles being filled at the same site. The recommended sample volume to be filtered for MST is 100 ml; if filtering, collect at least 200 ml in case of spills. One sample can be analyzed for multiple genetic markers (dog, human, bird, etc.)

Note: if shipping unfiltered samples to lab, use only one bottle per sample.

Collecting Water Sample Using Dipper Pole

A dipper pole may be used if site access or safety conditions deem it necessary. Sample collection using a dipper pole is easiest when done in teams of two: one person collects the sample using the dipper pole and another person holds the sample bottle into which the water sample is poured. Both people should wear gloves.

Write the sampling location, date, time, and site ID on the bottle label and place label on bottle. Cover with tape.

Put on clean gloves.

Rinse the dipper cup attachment three times by filling the cup pointed upstream and emptying the cup downstream.

Pointing the dipper cup upstream, fill the dipper cup.

Empty the dipper cup into either thrice rinsed or sterile sample bottle, filling to shoulder, taking care not to touch the rim of the dipper cup to the mouth of the sample bottle.

Repeat for additional bottles being filled at the same site. The recommended sample volume to be filtered for MST is 100ml; if filtering, collect at least 200 ml in case of spills. One sample can be analyzed for multiple genetic markers.

Place bottle(s) in cooler with frozen gel packs.

Filtering Sample

Samples are filtered and preserved using the GeneCount® qKit following LuminUltra Laboratory's instructions for liquid samples. There is a video demonstration of this process here. Note: the video was made prior to changing the recommended sample volume from 50 to 100 ml. **If not filtering sample, proceed to Step 5.** It is preferred to filter in the office but not required. If filtering in the field, choose a location sheltered from the weather and make the area as clean as possible.

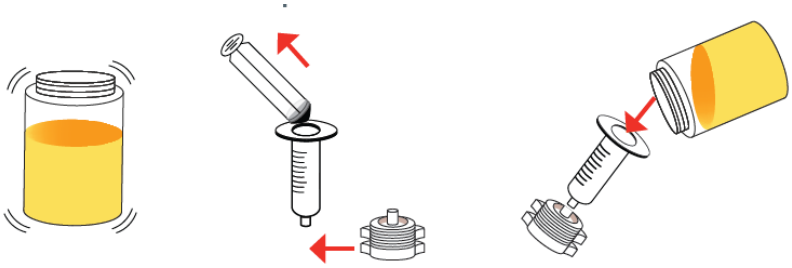
Sanitize work surface.

Put on clean gloves.

Mix the sample well

Remove the plunger from the syringe and attach the Luer-Lock Filter assembly. Pour 50 ml of sample into the syringe. Recap the sample bottle

Reinsert the plunger and slowly push the sample through the filter into a waste receptacle



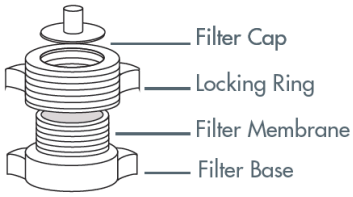
Remove the Luer-Lock Filter assembly, then remove the plunger

Reattach the Luer-Lock Filter assembly and pour another 50 ml of sample into the syringe. Reinsert the plunger and slowly push the sample through the filter into a waste receptacle.

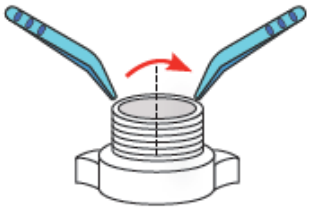
Record the final volume of sample that was filtered on the COC. If the recommended 100 ml of sample could not be filtered, record the actual volume processed.

Remove the filter assembly from the syringe, draw up 10 ml of air, reattach the filter, and push the plunger through the barrel over a waste receptacle.

Detach the filter and place it on a clean surface such as a paper towel. Carefully open the filter assembly by loosening the locking ring from the filter base.



Using sterile forceps, gently fold the filter membrane in half, being careful not to touch the center of the membrane where cells are collected. Carefully place the folded membrane into the Preservation Buffer A tube.



Note: if the filter membrane sticks to the filter cap, use forceps to gently remove it and lay it back on the fiter base with the residue side up.

Empty the contents of the Nuclease Free Water tube into the Preservation Buffer A tube. Close tube tightly and shake for 30 seconds to rehydrate and mix the contents.

Label the tube with identifying information about the sample.

Repeat for other samples.

Chain of Custody

A two-page chain of custody is to be completed containing project name and project manager information, sample information, and requested analyses.

Complete the Customer Information section, using the correct regional DEC office address for the project manager. The account manager field can be left blank. DEC's customer ID number is 196018. Enter the project name in the Purchase Order field. This allows invoices to be tracked and sent to the correct project manager. Unless the project requires rush analysis, write "N" for the remaining two boxes.

Under sample information, fill out boxes for Client Sample ID, Sample Type, Amount Collected, Units, and Collection Date. Sample ID should match what is written on the sample tube. If sample ID includes site and location information, those boxes may be filled with "n/a". Repeat for all samples.

In the instructions box for hold time/temperature exceedances, write "N/A" for filtered samples. For unfiltered samples, check desired box(es).

Print, sign, and date the "samples relinquished by" section. Proceed to the next page.

On the next page, under Microbial Source Tracking, check the qPCR boxes next to the desired genetic markers. Nothing else needs to be marked on this page.

Take a picture or make a copy of the chain of custody to retain with project records. The original will be shipped with samples.

Packing and Shipping: Filtered Samples

Filtered samples are packed in lab-provided materials and shipped to LuminUltra in the box from the qKit. Holding times for filtered samples are 4 weeks. Preserved samples do not require expedited shipping and can be shipped on standard ground. For shipping unfiltered samples, see Step 7.

Tightly wrap the foam pad around the sample tube and place it into provided resealable bag.

Pack the sample in the cardboard shipping box, or padded envelope, along with the completed chain of custody**.** Multiple samples may be shipped in the same box if each sample is labeled and documented appropriately. If shipping multiple boxes, each box should have its own completed chain of custody for the samples in that box.

Seal the box, attach shipping label, and send it to:

LuminUltra Technologies Inc. Attn: Lab Services
805 Pinnacle Drive, Suite M
Linthicum Heights, MD 21090

Note: The instructions on the qKit box request that LuminUltra lab be notified when samples are shipped. This is no longer necessary for preserved samples.

Packing and Shipping: Unfiltered Samples

Unfiltered samples are packed with gel ice and shipped via expedited service. Check the estimated delivery date and times to ensure samples arrive when the lab is open. **Do not ship unfiltered samples on Fridays.**

Wrap each bottle with paper towels and place it in an individual zip bag.
Place wrapped bottles in a cooler or in an insulated liner in a box.
Arrange frozen gel ice packs between and on top of bottles to maintain temperature.
Place completed chain of custody form in Ziploc bag inside the shipping container.
Close and seal the shipping box with packing tape for secure transport.

Equipment List

The following equipment will be needed for collecting the water samples and using the GeneCount® qKits to filter and preserve samples. This list does not include safety gear nor equipment needed for other concurrent field activities.

- LuminUltra GeneCount® qKit(s), one per sample
  Includes:
  - Instructions
  - Preservation buffer A
  - Nuclease free water
  - Luer-Lock assembly (filter housing and 25 mm filter)
  - 50 ml syringe
  - Forceps x 2

    - Spoon
    - Sterile flocked swab w/ breakpoint
    - Gloves
    - Packing material
    - Chain of custody form
- Hand sanitizer
- Gloves
- Dipper pole
- Screw-top plastic sample bottles (100 ml or greater)
- Zip bags
- Labels
- Tape or tape strips
- Extra blank chain of custody form (current form available at www.luminultra.com/coc)
- Labels
- Ink pen
- Fine point permanent marker
- Liquid waste receptacle (plastic cup, etc.)
- Bag to collect trash/waste

Example Chain of Custody

Example is for filtered samples. For unfiltered samples, check one of the three boxes under instructions for incidental temperature or hold time exceedance instead of writing “N/A”.

LUMINULTRA®

Laboratory Services
TESTING REQUEST/ CHAIN OF CUSTODY
* = REQUIRED INFORMATION

Please ensure this document is filled out accurately and consistently to ensure ease of reporting. Testing and turn-around-time will commence once the completed copy of this form is received. This document is only required for samples being sent to LuminUltra Lab Services. Please disregard this form if your sample is being sent elsewhere.

Customer Information* (Please include as much information as possible)			
Contact Name		Account Manager (if known)	
Company	Alaska Department of Environmental Conservation	Customer ID # (if known)	196018
Address		Purchase Order # (if applicable)	Project Name
Contact Phone		Rush Order? (Y*/N)	N (unless need Y) *additional fees may apply
Contact Email (s)		Wastewater? (Y/N)	N

SAMPLE INFORMATION* (all fields are required)

Select your requested assays/target from the checklist on p. 2. Select all that apply.
For samples requiring different testing targets, please use separate COC forms

	Client Sample ID (Name, Number, etc.)	Site (e.g., Building A)	Location (e.g., Well 1)	Sample Type (Liquid, Solid, Swab)	Amount Collected (Volume, Weight, Surface area)	Units (mL, g, cm^2)	Collection Date (YYYY-MM-DD)
1	Sample ID 1	n/a	n/a	Liquid	100	ml	YYYY-MM-DD
2	Sample ID 2	↓	↓	↓	↓	↓	↓
3	Sample ID 3						
4							
5							
6							
7							
8							
9							
10							

Special Sample Handling Requests

Instructions if hold time (48h) or temperature (15°C) is exceeded for unpreserved samples:
- ☐ Discard
- N/A
- ☐ Preserve and contact
- ☐ Proceed with analysis

Samples relinquished by: Print name
Date / Time:
Signature:

All LuminUltra samples should be shipped to:

LuminUltra Technologies Inc. ***Attn: Lab Services***
805 Pinnacle Dr, Suite M, Linthicum Heights, MD, 21090
Phone: +1 (506) 459-8777 customerservice@luminultra.com

To protect confidentiality, confirmation and results will only be sent to email address provided or authorized by contact provided. Signed form indicates agreement with the privacy policy and terms of service. For more information about our terms and conditions and turn around times visit luminultra.com/coc or scan the qr code

Feb 2, 2024

LUMINULTRA®

Laboratory Services
TESTING REQUEST/ CHAIN OF CUSTODY

Check the boxes next to desired markers

SEQUENCING	
NGS - 16S (Bacteria & Archaea) For timely entry into the GeneCount® Dashboard please ensure your Site, Location and Users are accurate	☐

INDUSTRIAL		
Assay Name	**qPCR**	**dPCR**
GeneCount® MIC Panel	☐	
GeneCount® Total Prokaryote Assay	☐	
GeneCount® Total Archaea Assay	☐	
GeneCount® Total Bacteria Assay	☐	
GeneCount® Sulfate Reducing Bacteria Assay	☐	
GeneCount® Sulfur-Oxidizing Bacteria Assay	☐	
GeneCount® Corrosive Methanogens (micH) Assay	☐	
GeneCount® Iron-Reducing Bacteria Assay	☐	
GeneCount® Methanogens Assay	☐	
GeneCount® Total Fungi Assay	☐	
GeneCount® Nitrifiers Panel	☐	
GeneCount® Ammonia-Oxidizing Archaea Assay	☐	
GeneCount® Ammonia-Oxidizing Bacteria	☐	
GeneCount® Comammox Bacteria Assay	☐	
GeneCount® Nitrite-Oxidizing Bacteria Group 1 (Including Nitrospira)	☐	
GeneCount® Nitrite Oxidizing Bacteria Group 2 (Including Nitrobacter)	☐	
GeneCount Pseudomonas Species Assay	☐	

To be filled out by LuminUltra

Date Received
Received By
Temperature
Raw/Preserved/Other

MICROBIAL SOURCE TRACKING		
Assay Name	**qPCR**	**dPCR**
Avian Fecal Assay (GFD)	☑	
Canada Goose Fecal Assay (CGOF1)	☐	
Canine Fecal Assay (BacCan)	☑	
Canine Fecal Assay (DG3)	☐	
Cattle Fecal Assay (CowM2)	☐	
Chicken Fecal Assay (CL)	☐	
Gull Fecal Assay (Gull-4)	☐	
Horse Fecal Assay (HoF597F)	☐	
Human Fecal Assay (HF183 Assay)	☑	☐
Human Fecal Assay (HumM2 Assay)	☐	☐
Pig Fecal Assay (Pig2Bac)	☐	
Ruminant Fecal Assay (Rum2Bac)	☐	

NOTE: If interested in testing for Human Fecal Assay using Method 1696, please contact our team. Email: customerservice@luminultra.com Phone: 506-459-8777

PATHOGEN		
Assay Name	**qPCR**	**dPCR**
GeneCount® *Enterococcus* Assay	☐	
GeneCount® *E. coli* Assay	☐	
GeneCount® *Legionella* Assay	☐	
GeneCount® *Legionella pneumophila* Assay	☐	
GeneCount® *Vibrio cholerae* Assay	☐	

Feb 2, 2024

Appendix F: 2025 Monitoring Season updates

Table 5. Haines Beach Monitoring Locations					
Site Name/ EPA ID	**Latitude**[6]	**Longitude**	**Site Description**	**Assessment Unit (EPA AK ID)**	**Years Monitored**
Lutak Inlet	59.324193	-135.540818	Beach off Lutak Spur Road to the east of the Chilkoot River outlet.	AK538329	May 20, 2025[7]
Portage Cove	59.229288	-135.436617	Beach off Beach Road between the Cruise Ship Dock and Fast Ferry Dock.	AK374717	2025, 2026
Pyramid Island	59.2044570	-135.4457288	Beach off Mud Bay Road directly across from Pyramid Island.	AK(TBD)	2025, 2026
Tanani Beach	59.271292	-135.440916	Beach off Lutak Road below Tanani Point picnic and rest area.	AK(TBD)	2025, 2026

TASK 2: Monitor beach water quality
Description: Develop a contract with a DEC-approved laboratory for fecal coliform and enterococci, and a contract for Microbial Source Tracking (MST) to be used for the project. The contract will specify the laboratory charges for sample analysis for the duration of the project. Additional laboratory charges may be incurred for expedited enterococcus sample results reporting to meet the 36-48 hour reporting time.

Conduct marine water quality monitoring during recreational use season for bacteria at three recreational beaches: Tanani Beach, Portage Cove, and Pyramid Island in the Chilkat Estuary. Sampling events should occur weekly at each beach location for two recreational seasons (typically mid-May through early September).

[6] Lat/long coordinates may be revised based on specific field sample location.

[7] Lutak Inlet Beach sampling location was replaced with Tanani Beach on May 27 because of access issues, and Tanani Beach has more recreational use by the community (e.g., swimming, dog walking, seaweed collection).

B.1.2 Identify the Site-Specific Sample Collection Location(s), Parameters to be Measured, and Frequencies of Collection

Table 8. Site Location and Rationale			
Site Name	**Latitude**	**Longitude**	**Site Description**
Lutak Inlet	59.324193	-135.540818	Beach off Lutak Spur Road to the east of the Chilkoot River outlet.
Portage Cove	59.229288	-135.436617	Beach off Beach Road between the Cruise Ship Dock and Fast Ferry Dock.
Pyramid Island	59.2044570	-135.4457288	Beach off Mud Bay Road directly across from Pyramid Island.
Tanani Beach	59.271292	-135.440916	Beach off Lutak Road below Tanani Point picnic and rest area.
Note: GIS maps of sampling locations are shown in the Appendix.			

Appendix A: Sample Site Locations