



Beach Monitoring Handbook

Ketchikan, AK

Alaska Beach Program Contact Information

DEC BEACH Project Manager - Gretchen Pikul

Phone: (907) 465-5023

Email: gretchen.pikul@alaska.gov

DEC BEACH Quality Assurance Officer – Chandra McGee (acting)

Phone: (907) 451-2140

Email: chandra.mcgee@alaska.gov

R&M Engineering, Inc.

7180 Revilla Road, Suite 300

Ketchikan AK 99901

(907) 225-7917 phone; (907) 225-3441 fax

May 2018

Alaska water quality criteria for bacteria in marine waters¹

Designated use	Description of criteria
(14) Bacteria, For Marine Water Uses	
(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 (STV) of 130 enterococci CFU/100 ml.

¹ Source: 18 AAC 70.020 Water Quality Standards, amended as of April 6, 2018.

Beach-Monitoring Handbook

This handbook introduces the DEC Beach Monitoring Program. The goal of the program is to reduce or eliminate illness and disease due to contact with water at recreational-use beaches that are contaminated by human and animal waste (fecal pollution).

This handbook was designed to provide you with simple instructions for beach assessments, water-quality sampling, and public notification in the event recreational water becomes contaminated with fecal pollution. The book is divided into four main sections.

Section 1 provides background information about the Alaska Beach Program, disease-causing organisms (Pathogens) and their indicators, and state and federal water-quality standards.

Section 2 gives you information about how to assess the risk of exposure to fecal contamination at beaches in your area. This section includes detailed information about how to collect, handle, and ship water samples for laboratory bacterial analysis, as well as how to conduct a beach survey.

Section 3 tells you whom you should notify when your beach assessment indicates marine water quality is unsafe for water-contact activities. It also provides information about how best to notify the public about the water quality at your beach(es).

Section 4 provides water sampling protocols and example field forms, press releases and signage.

Table of Contents

Beach-Monitoring Handbook.....	2
Table of Contents	3
Section 1 - Background.....	5
National BEACH Monitoring Program	5
Alaska BEACH Program	6
Grant Specific BEACH Information	7
Ketchikan BEACH Monitor Responsibilities	7
DEC BEACH Project Manager Responsibilities	8
Water Quality Standards (WQS).....	10
EPA’s Water Quality Standards	10
Alaska’s Water Quality Standards.....	10
BEACH Program.....	10
Section 2 – Community Beach Assessments	12
Overview.....	12
Beach Survey Field Form.....	12
Beach Survey Schedule and Locations.....	13
Community Beach Sampling.....	14
Sample Chain of Custody	14
Laboratory Responsibilities.....	15
Preliminary Quality Assurance/Quality Control (QA/QC) Review of Beach Sample Data	15
Communicating with DEC	17
Re-Sampling.....	17
Section 3 – Notifying the Public.....	19
Beach Advisory	19
Beach Signs	20
Fact Sheets or Flyers.....	20
Press Release	20
Section 4: Protocols and Example Forms	21
Water Sampling Collection Protocols.....	21
Water Sample Collection	21
Sample Collection Method.....	21
Sample Handling	23
Example Forms	25

Example Beach Sampling Field Form25

Example Beach Advisory Sign28

Example DEC Press Release29

DEC Approved Labs for Drinking Water.....**Error! Bookmark not defined.**

Section 1 - Background

Nationwide the greatest cause of coastal water quality impairment is bacteria.²

Beaches are a valuable recreational resource in Alaska. They provide access to coastal recreation waters for swimming, surfing, fishing, playing, and many other water-contact activities. Alaskans do not limit their recreational activities to sandy beaches; gravelly, rocky, or mud-covered beaches are commonly used for recreation. What Alaskans may not know is that recreational activities involving water contact could make them sick if the water is contaminated with human or animal waste (e.g., sewage or other sources of fecal pollution).

A wide variety of sources can contribute to the presence of pathogens associated with fecal pollution in coastal areas. While some of the sources may be direct of “point” sources (e.g., discharge from a waste water treatment plant), others may be “nonpoint” sources which are much harder to track (e.g., failing septic systems).

As rain washes over a watershed, it has the ability to gather pathogens from a number of different sources. Numerous sources makes the process of ruling out whether it is human related or not difficult. In many cases, birds, wildlife, and algae have been linked to being the sources of high levels of fecal bacteria.

People may get sick from recreating in water near possible fecal pollution sources, such as:

- sewage lagoons
- honey-bucket dumps
- sewage treatment plants
- septic tanks and leach fields
- small boats
- storm-water runoff
- landfills
- wildlife

Water contaminated with fecal pollution may contain disease-causing microbes (pathogenic bacteria, viruses, and protozoa). If people are directly exposed to or ingest this pollution, it can cause stomach aches, diarrhea, or ear, eye and skin infections. Water-quality monitoring at beaches near fecal-pollution sources can reveal conditions that indicate an elevated risk of becoming ill from water contact.

National BEACH Monitoring Program

The U.S. Environmental Protection Agency (EPA) developed the concept of a Beach Sanitary Survey as a means for providing State and local beach managers with a technologically sound and consistent approach to identify pollution sources and share information.³ The survey tool provides a method for documenting historic as well as current records of beach and watershed water quality. It provides baseline information including land use, water quality, and pollutant source data. The survey document is meant to serve as a living record that is

² US EPA. 2002. National Water Quality Inventory 2000 Report. EPA-841-R-02-001. Washington DC: Environmental Protection Agency.

³ US EPA. 2008. Great Lakes Beach Sanitary Survey User Manual. EPA-823-B-06-001 Washington DC. Environmental Protection Agency.

regularly updated and evaluated. The survey can be broken into two formats; routine and annual sanitary surveys, in order for temporal data to be evaluated in a more organized manner. The survey information is used by the Alaska Department of Environmental Conservation (DEC) to prioritize beaches for monitoring and assist in development of models to predict daily bathing beach water quality, if appropriate. The survey also provides support for enforcement actions as it establishes a record of conditions and changes over time. The Beach Sanitary Survey assists beach managers meet the requirements of the BEACH Act Grant Program, as described in the National Beach Guidance and Required Performance Criteria for Grants (USEPA 2002b).

Alaska BEACH Program

In response to the increasing incidence of water-borne illness at public beaches, the U.S. congress passed the Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000. The Act provides support for state programs to reduce the risk to beach users from contact with fecal contaminated water.

The Act authorized the EPA to award grants to states and tribes, and the DEC Division of Water (DOW) has used these grants to create an Alaska BEACH Program.

To date, the Alaska BEACH Program has:

- Defined many of the unique aspects of Alaskan recreational beach use;
- Sent surveys to Alaskan coastal communities to assess the likelihood of fecal pollution at their beaches;
- Used the survey data to rank beaches according to their potential exposure risk;
- Developed a generic beach-monitoring plan;
- Developed a generic risk-communication plan; and
- Conducted pilot water-quality sampling at some Alaskan beaches the community surveys identified as having risks of fecal pollution.

The DEC encourages communities to create local beach-monitoring programs and work with the DEC in notifying the public if there is an elevated risk of becoming ill from the water. Local management of water-sampling and public-notification programs should provide the most effective means of protecting the community from exposure to disease-causing organisms in human and animal waste.

Disease-causing organisms come from a variety of sources and can be fairly complicated to track and monitor. As a result of this, the DEC has developed a BEACH Sanitary Survey, based on EPA's survey tool, to assign levels of risk in coastal areas where recreational activity takes place, to aid in the identification and remediation of pollution sources, and to protect marine water quality on Alaska's beaches. Use of surveys is just one part of a larger effort to protect water quality through appropriate and relevant management activities. The BEACH Monitoring process includes, and is not necessarily limited to:

- An initial risk assessment of the coastal area of concern;
- Development or improvement of a water quality monitoring plan specific to a particular area;

- A notification plan to communicate levels of risk to the public;
- Conducting a sanitary survey on a routine basis;
- Means for measuring and monitoring results;
- Cooperation amongst land owners and resource managers to resolve or mitigate issues;
- Metrics to measure improvements over time; and
- Increases public awareness and cooperation in controlling water pollution.

The Alaska Beach Program follows requirements set out in the 2014 National Beach Guidance and Required Performance Criteria for Grants.

Grant Specific BEACH Information

Every BEACH grant program requires the development of a formal relationship with the landowner of the beach being proposed for monitoring. The Ketchikan Indian Community (KIC), the City of Ketchikan, and the Ketchikan Gateway Borough agree with the DEC to develop a local beach monitoring program, with the goal of protecting beach users from exposure to water contaminated by fecal pollution. The Ketchikan BEACH Monitoring Program receives support from the DEC in the form of training, limited funding for water-quality sampling, Standard Operating Procedures for sampling, a Quality Assurance Project Plan template, and a database template for data storage and sharing.

The Ketchikan BEACH Monitoring Program will consist of local individuals periodically conducting beach assessments and collecting water-quality samples for laboratory analysis. Their work will be coordinated by the Ketchikan BEACH Monitor who will keep in touch with the DEC BEACH Project Manager to keep her informed about sampling events.

The roles and responsibilities of the Ketchikan BEACH Monitor and DEC BEACH Project Manager are described in this section. Details about conducting sanitary surveys, collecting and shipping samples, and notifying the public about sample results are given in **Section 2** (Community Beach Assessments) and **Section 3** (Notifying the Public) of this handbook. Figure 1 shows a flow chart describing roles in project organizational structure. In many cases, it is likely that one person may fill more than one role.

Ketchikan BEACH Monitor Responsibilities

The main roles and responsibilities of the Ketchikan BEACH Monitor are to:

- Conduct beach assessments;
- Collect water-quality samples;
- Ship samples to a laboratory for bacterial analysis; and
- Notify the DEC and respective land owner in the event that water samples exceed acceptable bacteria limits.

The Ketchikan BEACH Monitor data analysis responsibilities include:

- Sending beach-sampling and sample identification information to the DEC BEACH Project Manager and DEC Quality Assurance Officer;
- Reviewing laboratory data results to ensure required Quality Assurance/Quality Control (QA/QC) criteria have been met;
- If QA/QC criteria have not been met, the Ketchikan BEACH Monitor will notify the DEC project manager as soon as possible, and in consultation with DEC and other affected parties, develop a corrective action plan to resolve the problem(s);
- Comparing the laboratory results to Alaska and EPA water-quality standards;
- Conferring with the DEC BEACH Program Manager regarding water-quality standard exceedances and the possible need for re-sampling; and
- Submitting laboratory data to the DEC, after completing QA/QC protocols, using DEC provided template or DEC approved format.

DEC BEACH Project Manager Responsibilities

The roles and responsibilities of the DEC BEACH Project Manager are to:

- Provide recommendations to Ketchikan for BEACH survey activities;
- Provide recommendations to Ketchikan for water-quality monitoring;
- Assist with water-quality data assessment;
- Work with the land owner to notify the general public of an exceedance following re-sampling and data assessment, and;
- Report beach-assessment and sampling data to the EPA.

The DEC BEACH Project Manager is also responsible for keeping a record of activities associated with sampling events. This record will include information on the dates, locations, samplers, and results of the monitoring, and will be used to compile an annual report to the EPA on recreational beach water quality for Alaska.

Most important, the DEC BEACH Project Manager will have lead responsibility in working with the municipality or responsible landowner to develop a public notice and other press-related information advising the public of the risks from marine water when beach sampling results exceed State or federal Water Quality Standards.

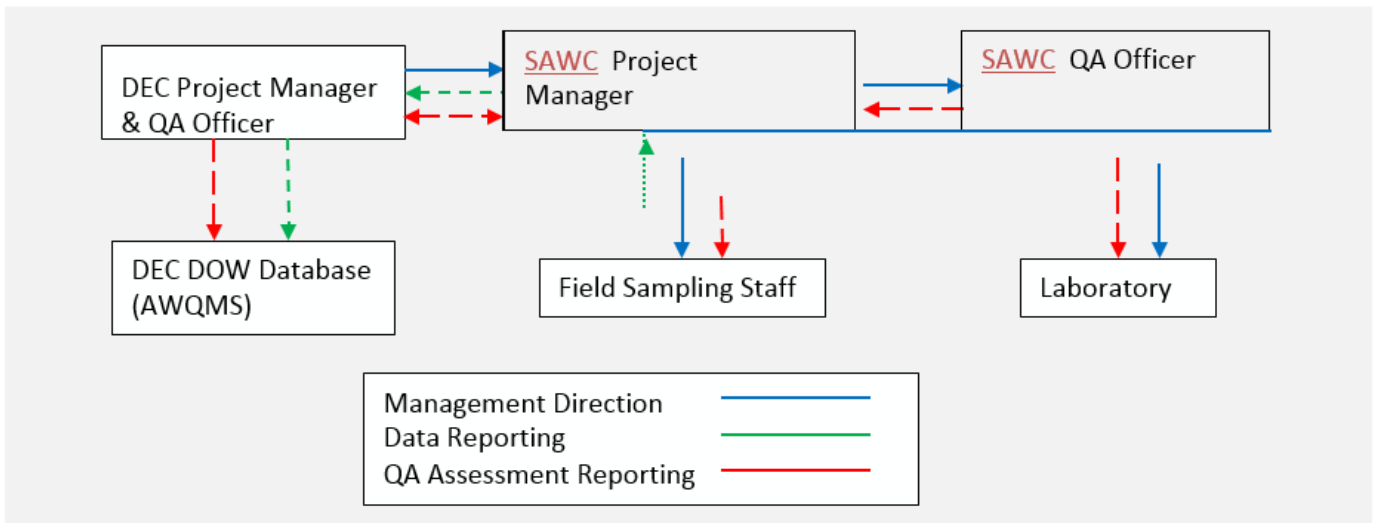


Figure 1: Project Organizational Structure

Water Quality Standards (WQS)

The BEACH program is concerned with fecal contamination. Bacteria can indicate the presence of fecal contamination, which itself may harbor disease-causing (pathogenic) microbes. The indicator bacteria most commonly used are called coliforms and enterococci. Federal and State Water Quality Standards (WQS) set limits for these parameters. Laboratory testing for the presence and abundance of these bacteria is required.

EPA's Water Quality Standards

The EPA recommends the use of enterococcus bacteria, or enterococci (pronounced ěn'tĕ-rĕ-kĕk'sĭ) as indicators of fecal pollution in marine water. Enterococcus bacteria are found in the human intestine. They are subgroup of the fecal streptococci. Studies indicate that the enterococci portion of the streptococcus group is the most efficient bacterial indicator of fresh and marine water quality.

As allowed under Criterion 10 of the EPA, July 2014, National Beach Guidance and Required Performance Criteria for Grants, Alaska has proposed and received an alternative Beach Action Value (BAV). Alaska's proposed BAV is equal to the EPA's 2012 Recommended Recreational Water Quality Criteria's Statistical Threshold Value (at the 36 per 1000 recreators' illness rate) of 130 CFU/100 ml (EPA-832-B-14-001). The 130 CFU/100 ml value corresponds to the 90th percentile of the water quality distribution associated with the same level of public health protection (in this case, 36 per 100 recreators').

Alaska's Water Quality Standards

The State of Alaska's water quality standard also uses enterococcus bacteria as indicators of fecal pollution in marine water for recreational use.

Alaska's water quality standard for pathogen indicators states, "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 (STV) of 130 enterococci CFU/100 mL." This standard for enterococci bacteria is provided in the Alaska Administrative Code 18 AAC 70 for marine water contact recreation. Enterococci bacteria must be determined by the membrane filter technique or Most Probable Number procedure as detailed in Standard Methods for the Examination of Water and Wastewater (American Public Health Association), or by other methods approved by the DEC and EPA. The Alaska standard is tabulated below (Table 1), and on the cover of this handbook.

BEACH Program

The Alaska BEACH Program will monitor both types of bacteria against WQS set for Marine Water Recreation- contact recreation (Table 1; 18 AAC 70 amended February 5, 2017). For the EPA WQS, the DEC has determined that Alaska's beaches are generally in the "lightly used" category; therefore, the DEC has adopted the single-sample standard of 130 enterococci per 100 mL for the BEACH program. In

addition, the geometric mean of five samples collected within a 30-day period may not exceed 35 enterococci per 100 mL.

Designated use	Description of criteria
(14) Bacteria, For Marine Water Uses	
(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 (STV) of 130 enterococci CFU/100 ml.

Table 1: Alaska Marine Water-Quality Indicator Standards⁴

⁴ Source: 18 AAC 70.020 Water Quality Standards, amended as of April 6, 2018.

Section 2 – Community Beach Assessments

Overview

A Sanitary Survey is a type of beach assessment used to identify sources of pollution. It can be an effective tool for protecting human health at recreational-use beaches by providing information that can be used to design future or modify existing monitoring programs. The Ketchikan BEACH Monitor should conduct surveys in suspected high-risk areas to confirm the presence or absence of fecal pollution. An Annual Survey should be conducted on all newly nominated beaches as well as the beginning of each season of on-going monitoring projects to document seasonal changes or new sources. Routine Surveys will be completed when a sample is collected for water-quality testing. Routine surveys are completed using the BEACH Survey Field Form provided in Section 4.

Annual BEACH Surveys collect information from area maps and land use plans, annual and seasonal trends, coastal geomorphic information, and additional potential sources of pollution at a watershed or sub-watershed level. In some cases Annual BEACH Surveys may be conducted at the end of a sampling season to determine whether changes to the monitoring program should take place in the following year. Information that should be considered during the survey process include:

- Freshwater inputs (river mouth, stream, storm drains);
- Properties with subsurface wastewater disposal systems;
- Significant wildlife habitat/wetlands;
- Agricultural operations;
- Impervious surfaces;
- Marinas/moorages/anchorages;
- Recreational areas and the availability of facilities (restrooms, trash cans, doggie bag disposal stations).

A Routine BEACH survey is conducted by visiting a beach of concern to answer questions and fill in blanks on the BEACH Survey Field Form. Since fecal coliform bacteria may originate from sources other than humans, the assessment will note the number of birds, dogs or other animals on the beach. Debris, vegetation, tide stage and murky water are also noteworthy. If animal waste sources are identified, Ketchikan Project Managers should discuss their observations with the DEC BEACH Project Manager as soon as possible. The survey may include collecting a water quality sample if the DEC BEACH Project Manager and Ketchikan Project Manager decide that beach users may be exposed to fecal pollution.

Beach Survey Field Form

The BEACH Survey Field Form is a data sheet used for collecting field information as part of the Routine and Annual BEACH survey process. It is designed to gather information that the Ketchikan BEACH Monitor and the DEC BEACH Project Manager can use to make annual and routine comparisons of

physical characteristics. It documents the physical conditions present during sampling events. These forms will be created and managed in a manner that will facilitate easy data entry into the Ambient Water Quality Monitoring System (AWQMS).

The BEACH Survey Field Form is made up of three parts:

1. The first part asks for a description of the beach including its location and the name of the person performing the assessment.
2. The second part asks for details about the water quality sample, if collected. These details include date, time sample number(s), and water temperature. The water temperature is determined by using a calibrated thermometer that reads to 0.1 degree centigrade (0.1°C). Record the temperature to 0.1°C. It is very important to allow time for the thermometer to stabilize before writing down the temperature reading.
3. The third part asks for information about the condition of the beach at the time of the assessment including the weather, levels of activity, and potential pollution sources.

To complete a BEACH survey, field staff must fill out all of the information on the Beach Survey Field Form including a sketch map of the sampling location. An example Beach Survey Field Form is located in Section 4.

Beach Survey Schedule and Locations

The Ketchikan BEACH Monitor should conduct BEACH surveys using the BEACH Survey Field Form at designated locations at the beginning of the sampling season and each time a water sample is collected for water-quality testing. These observations can help the Ketchikan BEACH Monitor and the DEC BEACH Project Manager assess changes from year to year and modify the existing monitoring program by identifying times during the season with the highest risk of people getting sick from water contact.

The Ketchikan BEACH Monitor may also conduct BEACH surveys at other suspected high-risk beaches to identify any persistent problems that may warrant a need for water-quality testing. The information gathered can be used by the Ketchikan BEACH Monitor and the DEC BEACH Project Manager to design future monitoring programs to protect human health during the recreation season.

Sampling location data should be collected using a calibrated GPS unit to ensure accuracy. All latitude/longitude data should be collected and recorded in decimal form (12.3456) using the Horizontal Collection System datum NAD83. All future sampling events should take place within 100 feet of that site unless the DEC BEACH Project Manager and Ketchikan BEACH Monitor determine that the site does not accurately represent background conditions of beach water quality.

Community Beach Sampling

The Ketchikan BEACH Monitor will determine the sampling location and schedule in coordination with the DEC BEACH Project Manager. Once a sampling site has been determined, Project and Sampling Location ID numbers will be provided by the DEC BEACH Project Manager to ensure that the site has an EPA assigned PRAWN code and consistent with the AWQMS template. Generally, the Ketchikan BEACH Monitor will collect samples on a weekly basis over a one month period, unless monitoring indicates that Alaska's or EPA's water quality standards are exceeded. Currently, the plan is to collect at least one sample per week at a location where people get in the water unless physical conditions and prior sampling dictates a more rigorous sampling regime.

Samples must be sent to a laboratory that is approved by DEC for Fecal Coliform Bacteria (Method 9222D) and Enterococci by MPN (Method ASTM D-6503-99). Fecal coliform bacteria are collected for comparison to other Alaska WQS designated uses in marine water, such as harvesting for consumption and aquaculture. A list of approved laboratories is attached at the end of this handbook (Appendix A). This list is updated periodically by DEC staff and found by visiting the DEC website (<http://dec.alaska.gov/applications/eh/EHLabStatus/MicroReport/Index>).

The sample collection should follow the tide/sampling schedule provided by the DEC BEACH project manager to target low tides, and be transported to the DEC-approved laboratory within the 6-hour sample holding time. The Ketchikan BEACH Monitor will need to coordinate with the laboratory to make sure someone is at the laboratory and able to process the samples as soon as they arrive.

Sample Chain of Custody

The sample chain of custody form documents actions taken to ensure that samples are traceable from the time they are collected at the beach to the time the analytical laboratory reports the results. The laboratory usually supplies these forms with their field sampling kit. Generally, a completed chain-of-custody form will identify the samples, request analysis from the laboratory, note any special instructions, and document who handled the samples from the time they were shipped from the field to the time they reach the laboratory. The Ketchikan BEACH Monitor is responsible for filling out the chain-of-custody form and keeping a copy for reference. The form must include the following information:

- Name and contact information of the person taking the samples;
- Sample identification, including the sample number, and date and time the sample was collected;
- The sample preservation method(s);
- The type of sample (e.g., water sample, sample replicates, field and temperature blanks) and the number of jars being submitted for analysis;
- The requested analysis (enterococcus and fecal coliform bacteria);
- The requested turn-around time (Note: the laboratory is requested to analyze the samples and present the results within 36 hours of sampling);

- Name and contact information for delivery of results (Note: the results should be sent to the DEC BEACH Project Manager and the Ketchikan BEACH Monitor; and
- A relinquishment signature including printed name, date and time.

In addition to completing the chain-of-custody form the Ketchikan BEACH Monitor needs to:

1. Put the completed chain-of-custody form into a plastic bag taped to the inside lid of the cooler;
2. Attach two completed chain-of-custody seals (stickers) to cross over the cooler lid seams;
3. Attach a clearly marked label with laboratory contact information on the top of the sample cooler;;
4. Hand deliver the samples to the airlines;
5. Keep a copy of the airlines' transportation documentation or other means of delivery for reference;
6. Contact the courier service to ensure pick-up and delivery of sample;
7. Contact the laboratory, again, to verify that someone will be there when the samples arrive; and
8. Fax or email a copy of the BEACH Survey Field Form to the DEC BEACH Project Manager.

Laboratory Responsibilities

The Ketchikan BEACH Monitor will work with the pre-determined laboratory to complete analysis of samples and data submission. Laboratories are responsible to comply with the data quality objectives specified in the QAPP and as specified in the laboratory QAP and method specific Standard Operating Procedures (SOPs). Validated sample laboratory data results are reported to the Ketchikan BEACH Monitor and DEC BEACH Project Manager. Electronic project data 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.

Preliminary Quality Assurance/Quality Control (QA/QC) Review of Beach Sample Data

When the Ketchikan BEACH Monitor receives sample results from the laboratory, the results need to be compared to the marine Water Quality Standards that are referenced in Section 1 of this handbook. The Ketchikan BEACH Monitor should check to make sure the sample was analyzed within the 6 hour holding time and that the temperature was within the allowed range when the samples were received at the laboratory. Secondary reviewers (sampling coordinator/supervisor/project supervisor) are responsible for the review, verification and validation of field and laboratory data and data reformatting as appropriate for reporting to AWQMS. The secondary reviewer is also responsible for reporting validated data to the DEC Project Manager. The data management task will include keeping accurate records of field and laboratory QA/QC samples so that project managers and technical staff who use the data will have appropriate documentation to show that the required minimum data quality standards have been met.

The DEC DOW Project Manager, DEC QA Officer and AWQMS data entry staff conduct final data reviews (tertiary review) and submits the validated data to AWQMS. See the flow chart in Figure 2 for detailed information on data management responsibilities.

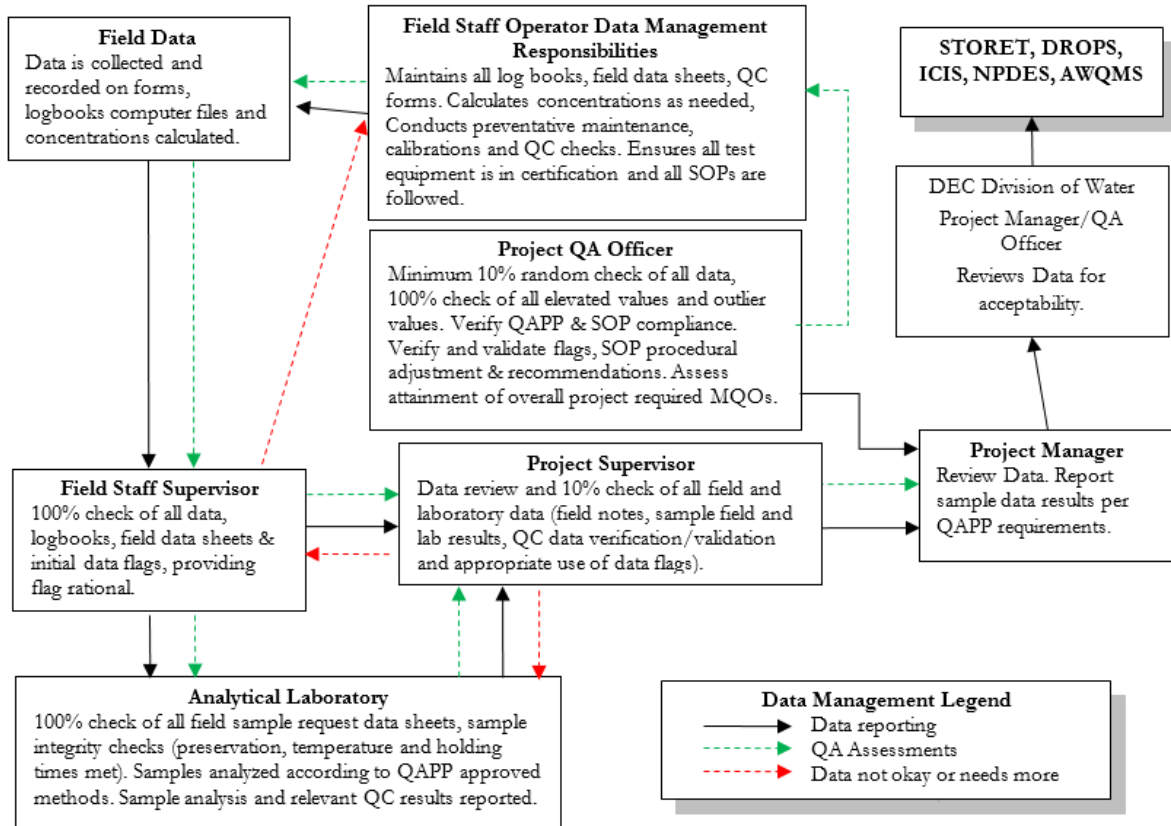


Figure 2: Data Management Flow Chart

Figure 2: Data Management Flow Chart

Communicating with DEC

After collecting and shipping samples to the laboratory, the Ketchikan BEACH Monitor will let the DEC BEACH Project Manager know that the samples are on their way to the lab, and send the completed BEACH Survey Field Form.

After reviewing the sampling results from the laboratory, the Ketchikan BEACH Monitor will need to talk to the DEC BEACH Project Manager to decide if additional sampling or public notification procedures should be initiated.

Re-Sampling

If a sample, after undergoing quality assurance review, is found to exceed BEACH program Water Quality Standards (WQS; Table 1), the Ketchikan BEACH Monitor is required to initiate an additional sampling event to confirm that the exceedence is an on-going issue (See Figure 3). Re-sample protocols will be consistent with those of routine events. If the re-sample event determines that the exceedence is on-going, a Beach Advisory (see Section 3) will be issued by the landowner and DEC. Routine sampling events will continue according to schedule and the Beach Advisory will remain in place until samples are below WQS.

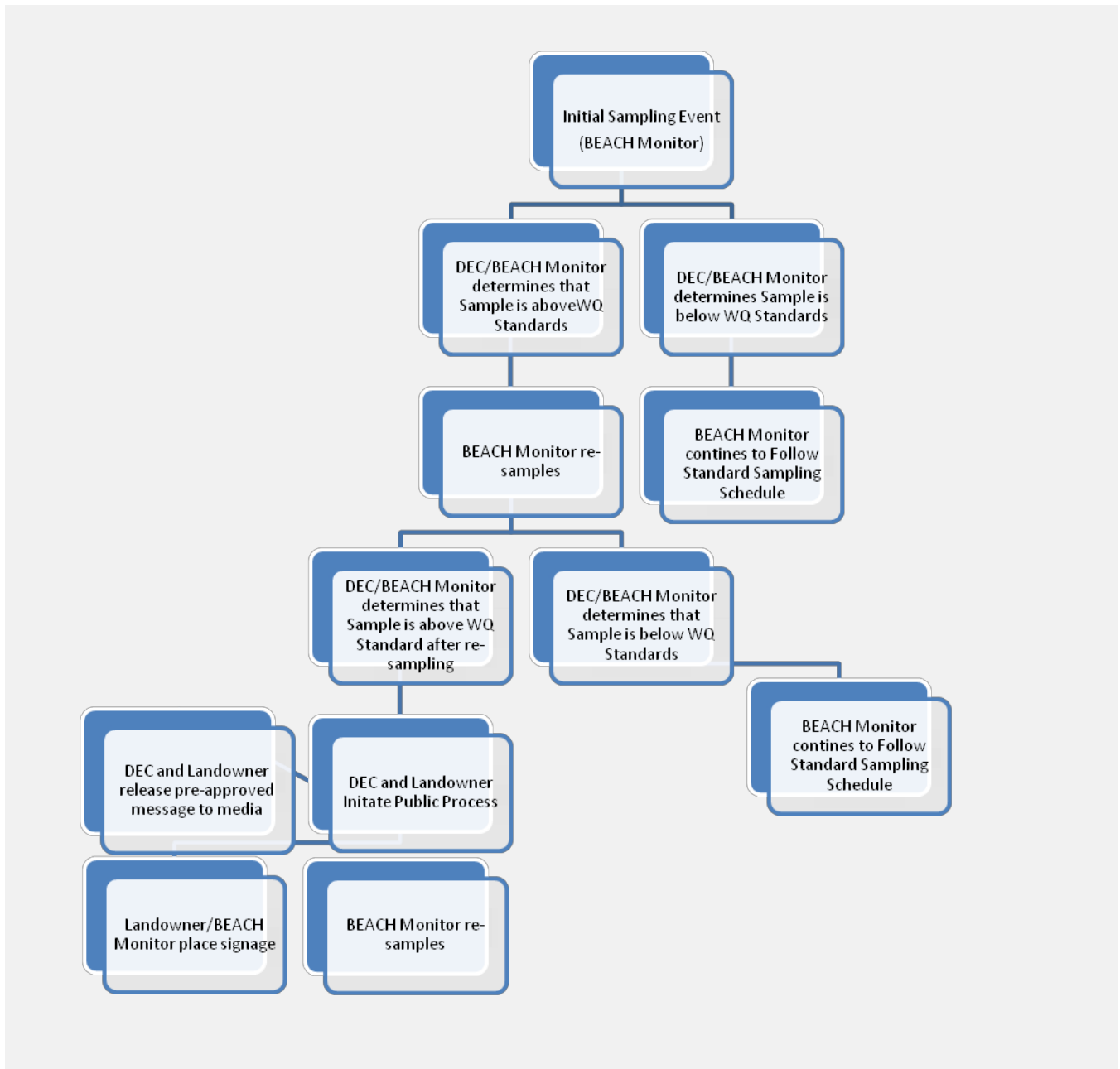


Figure 3: Sample Decision Tree

Section 3 – Notifying the Public

Communicating with the public regarding the nature of the BEACH program, sampling results, and potential responses to Water Quality Standards exceedances is very important. The DEC will work with the respective land owner to distribute public information about sampling results that may require actions such as a Beach Advisory or Beach Closure. Communication plans and specific actions taken will be developed between the DEC, landowner(s) and the BEACH Monitor on a case by case basis.

Beach Advisory

DEC recommends an advisory be issued to the public that warns of health risks from recreation in coastal water when beach-sampling results indicate potential fecal bacteria contamination. The advisory will be based on the bacterial counts and the information from the Beach Survey Field Form.

A Beach advisory provides recommendations to the public to avoid swimming in water that has exceeded the marine WQS referenced in Section 1 (Table 1) of this handbook. Sampling events are scheduled to take place throughout the recreational season. If a sample demonstrates an exceedance for enterococci bacteria, a re-sampling event will be triggered to verify that the presence of the bacteria is ongoing. A Beach Advisory may be issued by the respective land owner and DEC upon receipt of water quality re-sampling results that demonstrate a continued exceedance of water quality standards for bacteria.

The advisory should include:

- General heading (“ADVISORY” or “WARNING”);
- Reason for the advisory;
- Time of the advisory;
- Duration of the advisory;
- Location of the affected beach; and
- Number to contact local beach manager for further information.

Advisories should be issued in the form of press releases, signs at the affected beach, and fact sheets (informative flyers). The DEC will act as the lead in developing advisory information and signage. The press releases should be distributed to local media outlets, government offices, and emergency response entities, and advisory signs should be posted at the beach until additional assessments (sampling) indicate the water quality is acceptable. Contacts for public notification should be developed and verified at the beginning of each season. Table 2 is a framework for organizing possible contacts.

Table 2: Contacts for Public Notification during a Beach Advisory

Community Entity	Contact Person	Phone Number	Email Address
Radio Stations	KRBD	(907) 225-9655	
	KFMJ	(907) 247-3699	
	KTKN	(907) 225-2193	
Newspaper	Ketchikan Daily News	(907) 225-3157	http://www.ketchikandailynews.com/contact_us/
City Manager	Ruben Duran	(907) 228-6625	managersoffice@kgbak.us
Borough Manager	Karl Amylon	(907) 2285-5603	karla@ktn-ak.us
Police Department		(907) 225-6631	
Fire Department		(907) 225-9616	

These media outlets, local governments and emergency response entities can initiate their existing communication protocols to notify the public of potential health risks at the local beach(es). A standard-format press release public service announcement is included in Section 4.

Beach Signs

If a re-sampling event has been triggered and water quality standards continue to show exceedances, a sign should be posted at major beach access points to alert beach users of their risk of illness from water-contact recreation. A sign should also be posted on the beach near the location where the fecal contamination was detected so recreational users know it is not safe to swim there. This advisory should recommend that the public avoid water contact activities at the beach until further analyses reveal safe conditions. Signs will be in place until re-sampling determines that water quality standards are being met. An example of a Beach advisory sign is located in Section 4.

Fact Sheets or Flyers

Distributing informative flyers in public areas can also communicate potential health risks to local beach users. A flyer could be used as an advisory by passing out press release information to people in public places. It also could be used to educate the community about the BEACH Project. The Alaska BEACH Program produced a generic one page fact sheet about the BEACH project that answers commonly asked questions. It can be found at the DEC Alaska BEACH Grant Program website by clicking on the “What is BEACH Grant” quick link. The website address is <http://www.dec.state.ak.us/water/wqsar/wqs/beachprogram.htm>.

Press Release

A press release is likely the fastest way to spread the news about water quality at recreational use beaches in Alaskan communities. The DEC and landowner will act as the lead agents in providing public information.

Section 4: Protocols and Example Forms

Water Sampling Collection Protocols

Water Sample Collection

Water sampling involves wading into the water adjacent to a beach commonly used for water 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.). The Ketchikan BEACH Monitor will complete 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 (artificial ice reduces potential for cross contamination);
- The Beach Survey Field Form 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; and
- A copy of the Beach Survey Field Form and chain-of-custody form is sent to the DEC BEACH Project Manager.

Detailed directions for water sample collection, sample handling and delivery are given in the following subsections.

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:
 - A cooler;
 - The appropriate sample bottles for marine water-quality sampling (enterococci and fecal coliform bacteria);
 - Artificial ice to keep the cooler chilled to the appropriate temperature (<10°C);
 - Temperature blank;
 - Chain-of custody form;

- Custody seal;
 - Sample jar labels;
 - An extra set of sample bottles;
 - An extra set of sample bottles for a replicate sample;
 - Shipping labels; and
 - 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. **If necessary 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. Write the beach sampling location on the bottle label and Beach Survey Field Form.
 5. 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.
 6. 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.
 7. 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 one (1) foot below the water surface and tip it slightly upward to allow air to exit and the bottle to fill.
 8. Remove the bottle from the water. Pour out a little water to leave airspace at the top of the jar.
 9. Tightly close each bottle.

Collect one replicate for each analyte per sampling event. To collect a replicate sample, you must first have requested extra bottles from the laboratory. Repeat Steps 2 through 9 at the same location to complete collection of field replicates.

10. Complete bottle labels and attach them to each sample jar. Labels should be clean, waterproof, non-smearing, and large enough for all the information. Information on the label should include:
 - Sample location (e.g., beach name, KB-Rotary)
 - Sampling date and time
 - Laboratory method for analysis
 - Name of sampler

11. When finished sampling, 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.

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 to the laboratory in good condition. Step-by-step sample handling instructions are provided below:

1. 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. Samples must remain below 10°C until receipt by qualified staff at the laboratory, otherwise samples are determined invalid so ensure sufficient cold artificial ice is added.**
2. Place enough packing material inside the cooler to protect the sample bottles from breaking during transport to the laboratory.
3. Complete the chain-of-custody form. Put the form in a plastic bag and tape it to the inside of the cooler lid.
 - Write a note in the “Special Instructions” box requesting that the laboratory results be sent without delay (within 36 hours of sampling) to three people: Ketchikan BEACH Monitor, DEC BEACH Project Manager, and DEC BEACH Quality Assurance Officer.
4. If the cooler will be out of your immediate control (such as on an airplane or courier), fill out two custody seals and attach one to the front and one to the back of the cooler to span the lid seam. You want them to tear when the cooler is opened.

5. 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.”
6. Ship the samples to DEC-certified laboratory R&M Engineering-Ketchikan, Inc. (907) 225-7917.
7. **Remember that samples have to be collected, shipped and received by the laboratory in 6 hours. 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 and begin the analyses.**

Example Forms

Example Beach Sampling Field Form

Name of Beach _____ Date _____

Nearest Town _____

Describe Sampling Location (Note location on map and attach) _____

Latitude N _____ Longitude _____

SAMPLES

Sample(s) ID: _____ **Time:** _____

Replicate ID: _____ **Time:** _____

Field Blank ID: _____ **Time:** _____

Weather Conditions:

Sunny & Clear _____ Rain _____
Cloudy / Overcast _____ Fog _____

Other (describe): _____

Water Temperature: _____ °C

Air Temperature: _____ °F °C

Wind Speed (approx): _____ Mph

Wind Direction: _____ On Shore Off Shore

Precipitation in the last 24 hours: _____ in

Tidal Conditions:

Low Tide Ebbing
 High Tide Flooding

<u>Tide</u>	<u>Height</u>	<u>Time</u>
Low:	<input type="checkbox"/> ft <input type="checkbox"/> m	(am/pm)
High:	<input type="checkbox"/> ft <input type="checkbox"/> m	(am/pm)

Condition of the beach:

	Debris (Describe)	Vegetation (% Coverage)
On shore		
In water		

Activity on the Beach

Adults _____ Dogs _____
Children _____
Other
(describe): _____

Type of Activity

Swimmers _____ Walkers _____ Fishermen _____ Boaters _____
Other
(describe): _____

Condition of the Water

Clear Cloudy & Murky Oily Film
 Other
(describe): _____

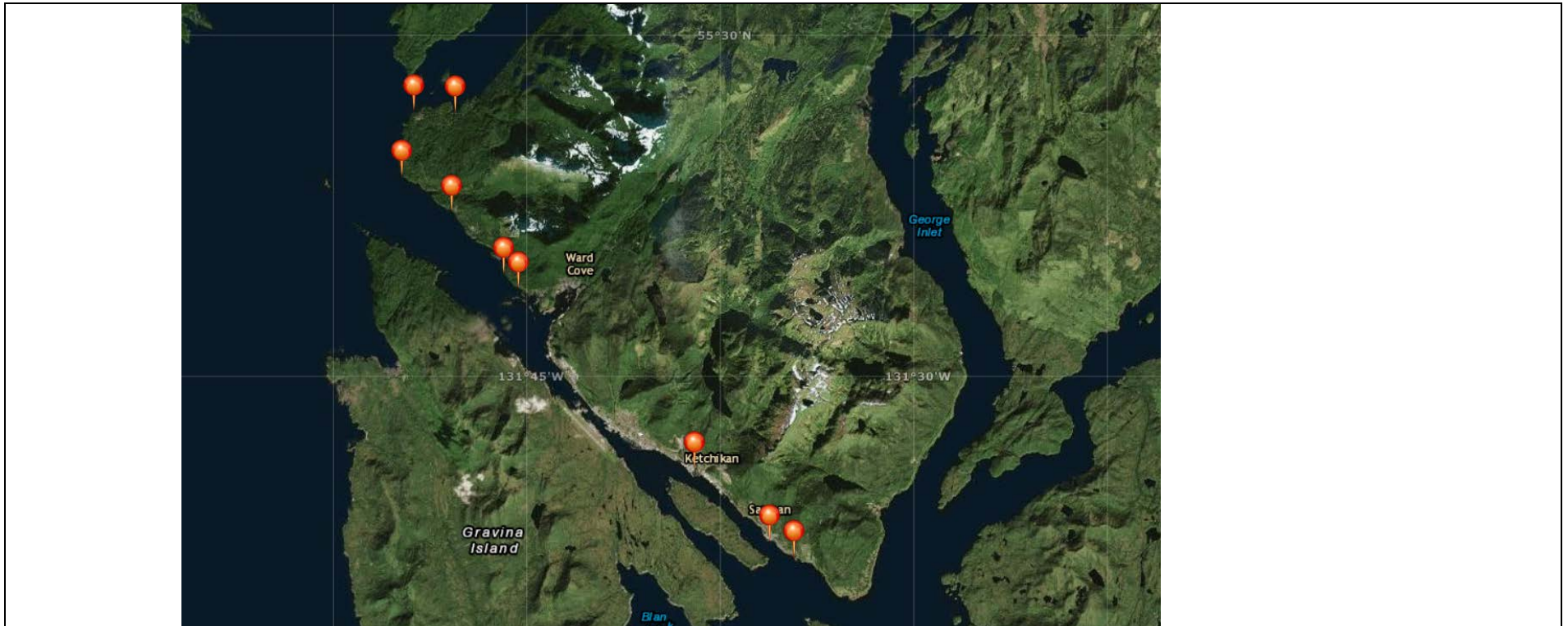
Potential Sources of Pollution

Water Fowl (approx #): _____ Boats (approx #): _____
 Other
(describe): _____
 Sanitary Facilities (describe): _____
 Sewage odor/presence (describe): _____
 Presence of stormwater pipes or other flow across the beach (describe): _____

Additional comments, noteworthy unusual conditions:

Sampler Name (Printed)

Signature



Sampling Notes: *(Put a mark on the map where you collected the sample)*

--	--

Date:		Sample Number:	
-------	--	----------------	--

Additional Comments:			
----------------------	--	--	--

Example Beach Advisory Sign

CAUTION

Swimming May Cause Illness

**WATER CONTACT AND INGESTION OF BEACH WATER MAY BE A HEALTH RISK
DUE TO HIGH LEVELS OF BACTERIA**

*Swallowing contaminated water may cause nausea, vomiting, diarrhea, and fever,
and contact may lead to ear ache or skin rashes.*

Wash after contact with water and avoid swallowing it or swimming.

Fish should be rinsed in clean water and cooked before eating.

Water quality samples with elevated enterococci bacteria levels were collected at
[Beach Name] on [sampling dates].

The water quality will continue to be monitored.

For more information about the results of sampling, please contact:

(FIRST and LAST NAME) at (PHONE NUMBER) or (EMAIL ADDRESS)

Example DEC Press Release

FOR IMMEDIATE RELEASE: [DATE]

CONTACT: [NAME, TITLE, PHONE, EMAIL]

Elevated Levels of [ENTEROCOCCI/FECAL COLIFORM] Bacteria Found at [BEACH NAME]

Ketchikan, Alaska – ([MONTH DAY, YEAR]) – Recent water quality samples collected at [BEACH NAME] indicate elevated levels of [ENTEROCOCCI/FECAL COLIFORM] bacteria in the water. The Alaska Department of Environmental Conservation (DEC) is collecting the samples this summer to determine if the water is safe for recreation.

Contact with water that has high levels of [ENTEROCOCCI/FECAL COLIFORM] may cause people to have stomach aches, diarrhea, or ear, eye and skin infections.

DEC suggests that beach users take normal precautions to avoid exposure, such as avoiding drinking or swimming in the water; washing after contact with the water, and rinsing fish harvested from the area with clean water. As always, people should cook seafood to a minimum of 145 degrees Fahrenheit internal temperature to destroy pathogens.

[BEACH NAME] is located at the [location description]. Water quality samples were collected [DATE(S)]. DEC continues to monitor water quality. If bacteria levels increase significantly, the [landowner] may post advisory signs at the beach until additional sampling indicates that bacteria numbers have dropped to safe levels.

[ENTEROCOCCI/FECAL COLIFORM] bacteria can come from any warm blooded animal including birds, seals, and humans. [The reason for the currently elevated levels is unknown. List any information know about potential sources, e.g. monitoring from nearby wastewater treatment plants.]

The beach sampling program is being funded and implemented by DEC with cooperation of [GRANTEE AND/OR LANDOWNER]. It is part of a nationwide effort to decrease the incidence of water-borne illness at public beaches under the federal BEACH Act.

For more information about the Alaska beach monitoring program contact the Alaska BEACH Project Manager (XXXX) (907-XXX-XXXX) or visit the Alaska BEACH Grant Program Website (<https://dec.alaska.gov/applications/eh/EHLabStatus/MicroReport/Index>)

DEC Approved Labs for Drinking Water

The screenshot shows the website header with navigation links: myAlaska, My Government, Resident, Business in Alaska, Visiting Alaska, State Employees. The main header includes the Alaska Department of Environmental Conservation logo and the text 'Division of Environmental Health'. A search bar is present with the word 'search' and a magnifying glass icon. Below the header, the page title is 'Laboratories Certified to Perform Microbiology Analyses of Drinking Water'. The main content area contains a paragraph of information, a list item, a disclaimer box, and a note. At the bottom, a table header is visible with columns for 'Lab', 'Method', and 'Analyte'.

Laboratories Certified to Perform Microbiology Analyses of Drinking Water

For further information about laboratories on this page contact the [Microbiology Certification Officer](#): (907) 375-8209. You may also be interested in: [Labs that are Certified to perform Chemical Analyses of Drinking Water](#).

How to become a Certified Lab in the State of Alaska:

- [Microbiology or Chemistry](#)

Disclaimer

The department in providing these lists does not guarantee the accuracy or validity of the data generated by these laboratories. A laboratory that is certified or approved has established that they have the ability to implement a quality control program in accordance with the appropriate Federal or State regulations or statutes.

Note... Laboratories in **blue** text do not accept samples from the public.

Lab	Method	Analyte
-----	--------	---------

R & M Engineering 7180 Revilla Road Ketchikan, AK 99901-5614 Phone: (907) 225-7917 Fax: (907) 225-3441 Expiration: 06/30/2018 Certification #: AK00911 Status: Provisional	9215 B HPC Pour Plate	Heterotrophic Bacteria
	9222 D Mem. Filtration (mFC)	Fecal Coliform
	MF (mColiBlue 24 MPN)	E. coli
	MF (mColiBlue 24 PA)	E. coli, Total Coliform