

Creating a Beach Safety Plan

The purpose of a Beach Safety Plan is to address and plan for risks associated with the use of beaches in your region. Creating a plan takes into account inherent risks of the beach as well as extraordinary events. The goal of creating this plan is to be able to proactively respond to events that may impact human health or safety. This document contains helpful information and templates for the creation of a useful beach safety plan.

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Definitions

Bathing beach: a public recreational water bathing area, formally recognized as lands controlled by a federal, provincial, regional, or municipal body or agency, which provides access to an ocean, a lake or a river.

Extraordinary event: an unusual event that impacts the recreational water area or surrounding beach

Primary contact: bather activities in which a person's whole body or face and trunk are frequently immersed in the water and/or the face is frequently wetted by spray, and where it is likely that some water will be swallowed by the bather.

Secondary contact: bather activities that result in only a person's limbs being regularly wetted.

Part 1: Identifying the Hazards

Use the following list of potential hazards at public beaches to prepare an action plan for each issue. The response for each issue should be similar for all beaches in your district. If there are special considerations, be sure to note them.

- *Point source contamination: sewage discharge, storm water discharge, fecal waste.*
- *Diffuse source of contamination: domestic and wild animals and birds, storm water runoff, septic waste runoff, contamination from swimmers.*
- *Chemical hazards: industrial discharges, contamination from marinas or watercrafts, chemical spills.*
- *Algae Bloom (cyanobacteria).*
- *Swimmers Itch (schistosomes).*
- *Physical hazards: litter, poor visibility, adverse weather.*
- *Complaints of Waterborne illness or disease outbreak.*

Environmental Health & Safety Survey Tool

The Environmental Health & Safety Survey tool provides a way to collect information about your beach and have it available in case of emergency. A completed survey is used when responding to an emergency situation and to determine the appropriate time to post a "Swimming Not Recommended" notification. The survey tool is available in Appendix A and should be completed for every beach. It is important to review and update the content annually.

Cyanobacterial Algae Blooms

Cyanobacterial blooms in recreational water bodies pose a challenge to both beach owners and health officials because even though they are recurring events, predicting the timing, magnitude, duration and potential health impact is complex. Although many species of cyanobacteria can produce nerve and liver toxins, not all do. In addition, when toxins are present, the amount can vary dramatically within the body of water and over time. Effective management of blooms is based on gathering numerous sources of available information. *The Decision Protocol for Evaluating Cyanobacterial Toxins in BC Drinking Water and Recreational Water* (https://www2.gov.bc.ca/assets/gov/health/keeping-bc-healthy-safe/healthy-communities/decision_protocol_for_cyanobacteria.pdf) provides strategies and resources to assist local

governments in assessing and managing the risks related to cyanobacterial bloom formations in water bodies used for both recreational and drinking water purposes.

Part 2: Monitoring Hazards

Sampling

- **Timing:** Sampling is best undertaken when the beach is in use, with many bathers present because this will present a worst-case scenario of the risk exposure to bathers.
- **Depth of Sampling:** Depth of sampling can have a significant effect upon results. Only samples collected at chest depth have been shown to have a correlation between organism density and illness. Sampling at a shallower depth may increase bacterial counts due to sand and sediment disturbances, but will be more representative of the water encountered by children. Sampling in water of knee to waist depth offers a reasonable approach to monitoring.
- **Sampling Techniques:** The sample bottle should be pushed ahead, underwater, and not be completely filled, to allow for the specimen to be shaken during testing.
- **Event Sampling:** Sampling is recommended for event driven episodes of pollution such as following periods of heavy rainfall or high swimmer activity.

Sampling Frequency and Procedure

Local governments are responsible for collecting beach samples and submitting them to the lab for analysis.

There is a Beach Water Sampling Frequency Assessment Tool in Appendix B. Complete this tool to determine the score for each beach and then enter the beach name into the appropriate box in Table 1- Beach sampling table. Review this information annually.

The frequency of sampling should be based on the Inherent Risk Score from the Assessment Tool in Appendix B. Beaches with a score of less than 75 do not need to be sampled weekly but should be audited occasionally. Beaches with a value greater than or equal to 75 should be sampled weekly throughout the beach season.

Table 1: Beach sampling frequency table

| Assessment Tool Inherent Risk Score (from Appendix B) | Sampling Frequency | Beach Name(s) |
|-------------------------------------------------------------|--------------------|---------------|
| Less than 75 | Audit | |
| Greater than or equal to 75 | Weekly | |

Sampling Modifications: If you wish to create a sample site or change your sample frequency, please contact your Environmental Health Officer.

Biological Monitoring

- Recreational waters used for primary contact activities (see definitions), the Guidelines for Canadian Recreational Water Quality state the following values are acceptable:
 - Geometric mean concentration (minimum of five samples within a 30 day period): ≤ 200 E. coli/100mL
 - Single-sample maximum concentration: ≤ 400 E. coli/100MI

Part 3: Responding to a Hazard

Important Contacts

Make a list of contacts that you may need during a hazard response. Update it as often as possible.

| Contact Type and Name | Phone #s | What they do |
|----------------------------------------|----------|--------------|
| Beach Operator | | |
| | | |
| | | |
| Local Government Contact (daytime) | | |
| | | |
| | | |
| Local Government Contact (after hours) | | |
| | | |
| | | |
| Environmental Health Officer | | |
| | | |
| Medical Health Officer On Call | | |
| | | |
| Beach (maintenance) Contractor | | |
| | | |
| | | |

Sampling Response

Determine what your response will be for each level of bacterial contamination and what other considerations you will take into account when determining if notification should be posted.

Single sample over 400 E.coli:

5 samples over 200 E.coli (5 log mean):

Occasional sample results over 400 E.coli with acceptable results in between:

Algae Bloom Response

Develop a response protocol for reported Algae blooms on water bodies within your jurisdiction. Algae blooms need to be characterized as well as determining if the bloom is producing toxins. A number of resources are available including Ministry of Environment and Interior Health. Both of these agencies should be contacted as part of the owner's response.

Signage

Sample signage is located in Appendix C. Create your own signage and keep copies with your Beach Safety Plan for ease of reference.

Hazards that may warrant signage include:

- Strong currents
- Steep slopes or drop-offs
- Flooding
- Spills
- Shoreline or water obstructions which may cause injury
- Specific hazards/factors (list) which may cause injury or illness
- Algae bloom

Resources

Appendix A – Environmental Health & Safety Survey Template

| BATHING BEACH | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------------------------------|
| Environmental Health & Safety Survey & Sampling Frequency Tool | | |
| Beach Name: | | |
| Site Address: | | |
| Responsible Authority (Beach Owner): | | |
| Phone: | Cell: | Fax: |
| Email: | | |
| Person Conducting Survey: | | |
| Date & Time of Survey: | | |
| Environmental Health Officer: | | |
| Beach Specifications | | |
| Name of Water Body: | | # Sampling Sites: |
| Surrounding Land Details <i>Check all that apply:</i> | | |
| <input type="checkbox"/> Urban | <input type="checkbox"/> Field | <input type="checkbox"/> Commercial (specify) |
| <input type="checkbox"/> Suburban | <input type="checkbox"/> Hills/Uplands | <input type="checkbox"/> Agriculture (specify) |
| <input type="checkbox"/> Rural | <input type="checkbox"/> Marsh/Swamp | <input type="checkbox"/> Industrial (specify) |
| <input type="checkbox"/> Forest | <input type="checkbox"/> Landfill | <input type="checkbox"/> River/Stream/Ditch/Harbour (specify) |
| Description of surrounding land: | | |
| MICROBIOLOGICAL HAZARDS | | |
| Items for consideration: | | |
| <ul style="list-style-type: none"> • Proximity of potential contamination sources to the swimming area. • Potential for contamination sources to have an impact on the swimming area (including an indication of their risk priority: Low, medium, high). • Evaluation of water quality according to historical microbiological data (e.g. frequency of exceedances of the guideline values for the recommended indicators of faecal contamination - continuous/periodic/sporadic). • Discharges: Assessment of such factors as volume, flow rate, treatment type, applicable indicator standards, periodicity (continuous, sporadic) and predictability. • Effects of rainfall: levels triggering contamination events and typical event duration. • Assessment of swimming area circulation: effects of onshore winds, tides, currents, flow patterns in transporting faecal contamination to and entrapping it within the swimming area. | | |

- Animals and birds: assessment of their types, numbers, and droppings.
- Impact of swimmers on water quality – numbers, ages.
- Assessment of potential barriers: Barrier types and points at which they may be applied to reduce the impact of the contamination source and/or swimmer exposure.

Check all microbiological hazards that apply:

- Municipal sewage discharges Animal feeding operation waste
- Combined sewer overflows (CSOs) Storm water drains/discharges
- Other discharges containing faecal wastes (list): _____
- _____
- Other sewage collection/disposal/treatment systems (list): _____
- _____

Storm water runoff from:

- Agricultural areas Areas receiving sewage sludge Beach and surrounding area

2 Yr. Microbiological History:

- 95% of samples less than 400 60-94% of samples less than 400 > 60% of samples less than 400

Other Environmental Sources:

- Rivers/streams/creeks discharging near beach Upstream activities Wild animals

Birds (e.g. Gulls, ducks, geese):

- None Low Medium High

Swimmers (average/day use during bathing season):

- None Low (< 50) Medium (50-100) High (> 100)

Pets:

- None Low Medium High

Chemical Hazards

Items for consideration:

- Proximity of potential contamination sources to the bathing area.
- Potential for contamination sources to have an impact on the swimming area (including an indication of their risk priority: Low, medium, high).
- Discharges: Assessment of such factors as volume, flow rate, treatment type, periodicity (continuous, sporadic) and predictability.
- Effects of rainfall: Levels triggering contamination events and typical event duration.
- Assessment of swimming area circulation: effects of onshore winds, tides, currents, flow patterns in potentially transporting chemical contamination to and entrapping it within the swimming area.
- Motorized watercraft: assessment of their types and numbers
- Assessment of potential barriers: Barrier types and points at which they may be applied to reduce impact of the contamination source and/or swimmer exposure.

Check all chemical hazards that apply:

- | | | |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <input type="checkbox"/> Areas subject to fertilizer application | <input type="checkbox"/> Storm runoff from areas subject to pesticide application | <input type="checkbox"/> Commercial/Industrial Discharges (list): |
| <input type="checkbox"/> Motorized Watercraft | <input type="checkbox"/> Urban areas | <input type="checkbox"/> Marinas (list): |

Other Biological Hazards

Items for consideration:

- Seasonal nature of the hazard: continuous, annual, sporadic
- Presence of contributing factors (as applicable): water conditions, local geography, temperatures, nutrient levels, presence of appropriate host species. Assessment of potential barriers to control hazard and/or reduce human exposure in areas/during times of increased risk

Biological hazards known to affect recreation water areas:

Cyanobacterial blooms: Continuous Seasonal Sporadic

Schistosomes (swimmer's Itch): Continuous Seasonal Sporadic

Large numbers of aquatic plants: Continuous Seasonal Sporadic

Physical Hazards and Aesthetic Considerations

Items for consideration:

- Assessment of the physical characteristics of the beach and their potential impacts on safe enjoyable use of the area. Includes evaluation of physical layout geography, topography), composition of shoreline and bottom material, influence of existing structures.
- Assessment of potential risks posed by specific hazards/factors in causing injury or illness or otherwise interfering with the enjoyable use of the area.
- Shoreline and water free from obstructions and of sufficient clarity to permit viewing of persons who may in distress.
- Assessment of the nature and origin of litter and floating debris.
- Applicable physical and aesthetic parameters (pH, temperature, turbidity, colour, clarity, litter) in agreement with recommendations given in the Guidelines for Canadian Rec Water Quality.
- Assessment of potential barriers to control hazard and/or reduce human exposure in areas/during times of increased risk.

Check all physical hazards and aesthetic considerations that apply:

Subsurface hazards:

- | | | |
|----------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------|
| <input type="checkbox"/> Steep slopes or drop-offs | <input type="checkbox"/> Large rocks | <input type="checkbox"/> Sand/mud/gravel/rock lake substrate |
| <input type="checkbox"/> Depths greater than 4.5 m | <input type="checkbox"/> Slippery or uneven bottom (rock) | |

Water Conditions:

- | | | |
|--------------------------------------------|-----------------------------------|------------------------------------|
| <input type="checkbox"/> Strong currents | <input type="checkbox"/> Undertow | <input type="checkbox"/> Rip tides |
| <input type="checkbox"/> Boats/Watercraft? | | |

Litter on beach? None Low Medium High

Vehicles permitted on beach? No Yes

| | | | | |
|--------------------------------|-------------------------------|------------------------------|---------------------------------|-------------------------------|
| Broken Glass or sharp objects? | <input type="checkbox"/> None | <input type="checkbox"/> Low | <input type="checkbox"/> Medium | <input type="checkbox"/> High |
| Floating debris? | <input type="checkbox"/> None | <input type="checkbox"/> Low | <input type="checkbox"/> Medium | <input type="checkbox"/> High |
| Seaweed/algae on beach? | <input type="checkbox"/> None | <input type="checkbox"/> Low | <input type="checkbox"/> Medium | <input type="checkbox"/> High |
| Medical waste? | <input type="checkbox"/> None | <input type="checkbox"/> Low | <input type="checkbox"/> Medium | <input type="checkbox"/> High |

Facilities and Safety Provisions

| | | |
|----------------------------------------|-----------------------------|-------------------------------------|
| Toilets | <input type="checkbox"/> No | <input type="checkbox"/> Yes #_____ |
| Showers | <input type="checkbox"/> No | <input type="checkbox"/> Yes #_____ |
| Drinking water fountains Portable taps | <input type="checkbox"/> No | <input type="checkbox"/> Yes #_____ |
| Litter/recycling bins: | <input type="checkbox"/> No | <input type="checkbox"/> Yes #_____ |
| Picnic tables | <input type="checkbox"/> No | <input type="checkbox"/> Yes #_____ |
| Lifeguard stations: | <input type="checkbox"/> No | <input type="checkbox"/> Yes #_____ |
| Access for persons with disabilities: | <input type="checkbox"/> No | <input type="checkbox"/> Yes |
| Emergency phone number | <input type="checkbox"/> No | <input type="checkbox"/> Yes |
| Accessible lifesaving equipment | <input type="checkbox"/> No | <input type="checkbox"/> Yes |
| First aid stations | <input type="checkbox"/> No | <input type="checkbox"/> Yes |

Appendix B – Beach Water Sampling Frequency Tool

| Beach Water Sampling Frequency Assessment Tool | | |
|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|--------------|
| Beach name: | Date of completion: | |
| Person completing assessment: | | |
| <i>Category</i> | <i>Description</i> | <i>Score</i> |
| 1. Type of Water | <ul style="list-style-type: none"> • Fresh water | 15 |
| 2. Bather use (average per day use during bathing season) | <ul style="list-style-type: none"> • High: > 100 bathers | 25 |
| | <ul style="list-style-type: none"> • Med: 50-100 bathers | 15 |
| | <ul style="list-style-type: none"> • Low: < 50 bathers | 5 |
| 3. Microbiological History (based on last two years) | <ul style="list-style-type: none"> • Geometric Mean has exceeded 200 E.coli/100 m | 25 |
| | <ul style="list-style-type: none"> • Single Sample has exceeded 400 EC/100 ml | 20 |
| | <ul style="list-style-type: none"> • Some single sample results range from 100-400 EC/100 ml | 15 |
| | <ul style="list-style-type: none"> • All single sample results are < 200 EC/100 ml | 5 |
| | <ul style="list-style-type: none"> • New Beach or Beach with no historical data | 25 |
| 4. Potential Fecal Contamination (choose all that apply) | <ul style="list-style-type: none"> • Community sewage treatment outfall/overflow right at the beach | 25 |
| | <ul style="list-style-type: none"> • Community sewage treatment outfall/overflow - in proximity* of the beach | 20 |
| | <ul style="list-style-type: none"> • Water front homes or public washrooms on private sewage systems | 15 |
| | <ul style="list-style-type: none"> • Water front agricultural areas (i.e. Manure spreading, cattle) | 15 |
| | <ul style="list-style-type: none"> • Seasonal or regular presence of wildlife (i.e. Ducks, geese) and pets | 15 |
| | <ul style="list-style-type: none"> • Boats with facilities / houseboats | 15 |
| | <ul style="list-style-type: none"> • No known sources of fecal contamination | 0 |
| 5. Storm Water | <ul style="list-style-type: none"> • Urban/agricultural creek or storm drain(s) right at the beach | 20 |
| | <ul style="list-style-type: none"> • Urban/agricultural creek or storm drains(s) in proximity of the beach | 15 |
| | <ul style="list-style-type: none"> • No creek or storm drain in vicinity of beach | 5 |
| 6. Dilution and mixing of water | <ul style="list-style-type: none"> • Limited to no water mixing | 20 |
| | <ul style="list-style-type: none"> • Open and constant mixing of water | 5 |
| 7. Sanitary Facilities | <ul style="list-style-type: none"> • Public washroom / privy not available | 15 |
| | <ul style="list-style-type: none"> • Public Washroom / privy available | 0 |
| Inherent Risk Score | | |

*in proximity – where the source of contamination is upstream or downstream; and/or flows could carry the contamination to the bathing area. Additional information or knowledge of the area may be needed.

Beach Water Quality



Poor

Swimming is not recommended

Bacterial counts exceed Health Canada guidelines

(other hazards or messaging may be inserted)

For more information contact the beach owner at:

___ or view the information online at ___ or
www.interiorhealth.ca