



***DRAFT***

**Beach Environmental Assessment, Communication and Health  
BEACH Program Guidance**

**For Washington's Marine Recreation Beaches**

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# Beach Environmental Assessment, Communication and Health BEACH Program

## For Washington's marine recreation beaches

	<u>Page</u>
Introduction.....	1
Acknowledgements.....	2
1.0 BEACH List.....	3
2.0 Water quality.....	5
2.1 Threshold guidance.....	5
2.2 Monitoring.....	7
2.3 Predictive tools.....	7
2.4 Monitoring and notification protocol.....	8
3.0 Advisory and notification procedures.....	9
3.1 BEACH Program notification.....	9
3.2 Advisory.....	10
3.3 Warning.....	12
3.4 Closure.....	14
4.0 Procedures for removing advisories and reopening recreational beaches.....	17
Appendices	
A: Definitions.....	18
B: Water monitoring protocols.....	21
C: Health and safety guides and resources.....	22
D: Resources for addressing pollution problems.....	23
E: RCW 70.05.070, RCW 70.90.120, WAC 246-260-180, and WAC 173-201A-030.....	25

## Introduction

Washington's **Beach Environmental Assessment, Communication and Health (BEACH) Program** is funded through a U.S. Environmental Protection Agency (EPA) grant. Congress authorized EPA to award grants to states for the development and implementation of BEACH programs which will reduce the risk of disease to users of the Nation's marine recreational waters. The grant money is to be used by states to develop and implement a program which will support microbiological testing and monitoring of marine recreational waters along with a communication program to notify the public of potential exposure to disease-causing microorganisms. The State of Washington's BEACH Program will meet the requirements specified in the Clean Water Act (CWA), Section 303(i). Continuation of the Program is dependent upon federal funding.

The BEACH Program is being developed through an inter-agency committee led by the Department of Ecology (Ecology). Implementation of the program will be a cooperative effort by the State of Washington's departments of Ecology and Health, various other state agencies, local health care authorities, tribal governments, volunteer organizations, the public, and other interested parties. Revisions to the Program will occur through evaluation and recommendations by the BEACH Committee, participants in the BEACH Program, and the public.

The BEACH Program is being developed using EPA's *National Beach Guidance and Performance Criteria for Recreational Waters*<sup>1</sup>. While the State of Washington does not have comprehensive regulations specifically for managing recreational marine beaches, the State of Washington does have formal *Water Quality Standards for Surface Waters of the State of Washington*<sup>2</sup> and requires the Board of Health to adopt rules which govern safety, health, and water quality for water recreation facilities<sup>3</sup>. A committee made up of environmental health directors and state officials wrote a guidance document, *Guidance for Recreation Waters and Beaches* July 2001<sup>4</sup>, which is a valuable tool for managing recreational beaches. The BEACH Committee used this document as a reference while designing the BEACH Program.

### Notice

Washington State regulations give authority for enforcing the public health statutes of the State to the local health officers (Appendix E). The BEACH Program will provide local health officers notification of test results when above threshold limits established by this Program.

### Goal

The BEACH Program has the goal of reducing the risk of disease to users of Washington's marine recreational beaches. The Program has been developed to support microbiological monitoring and an efficient communication system that will notify the public of potential exposure to disease-causing microorganisms. Monitoring efforts will focus on recreational beaches with high water contact use and potential pollution problems. Monitoring and notification of coastal marine water quality provides information to the public regarding the relationship between water quality and human health and safety.

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<sup>1</sup> USEPA. 2002 *National Beach Guidance and Required Performance Criteria for Grants*. EPA-823-B-02-004. June 2002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

<sup>2</sup> Appendix E, WAC 173-201A-030

<sup>3</sup> Appendix E, RCW 70.90.120, RCW 70.50.070, and WAC 246-260-180

<sup>4</sup> *Recreational Waters and Beaches Resource Guide*. Washington State Department of Health and Environmental Health Directors' Living Environmental Committee, 2001. Washington State Department of Health, Tumwater, Washington.

## Acknowledgements

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## **1.0 BEACH List**

After receiving input from the public and from state, tribal, and local health care authorities, the BEACH Committee will develop, maintain, and evaluate annually a list of marine beaches used by the public for recreation. The BEACH List will be prioritized according to density of users, water quality, public input, point source pollution, nonpoint source pollution, rainfall, extent of water contact when recreating, numbers of children in the water, and limited marine recreation alternatives. The list will have a tiered structure used to identify which marine recreation beaches are eligible for monitoring through the BEACH Program.

The method for prioritizing the BEACH List has not been determined at this time. A workgroup will be formed to address this issue by winter 2003.

### **Tier Structure**

- Tier I – The public marine recreational beaches appearing on the prioritized BEACH List, beginning with the number one prioritized public marine recreational beach and inclusive, in descending order, the sites for which the BEACH Program has adequate funding to cover monitoring costs.
- Tier II – The public marine recreational beaches which appear on the prioritized BEACH List and have been identified by the BEACH Committee, public, state, tribal, or a local health authority as sites for which monitoring would benefit public safety, but for which there is not adequate funding to cover monitoring costs.
- Tier III – The public marine recreational beaches which appear on the prioritized BEACH List and have been identified by the BEACH Committee, public, state, tribal, or a local health authority as sites with lower public safety impacts and for which monitoring would currently be deferred regardless of funding.

## **BEACH Program participation**

Tier I - Marine recreational beaches will be eligible for routine monitoring and for monitoring major pollution events through the BEACH Program. The BEACH Coordinator will work with local health authorities and site managers to determine the preferred authority for sample collection and analysis of water quality samples. The BEACH Program will fund sample collection and analysis through grant agreements. Program direction and guidance will be incorporated into the agreements.

Tier II – Ideally, all at risk marine recreational beach sites will have monitoring costs covered using funds from the BEACH grant received from EPA or from other sources. However, if there is not adequate funding to cover monitoring on a weekly basis, marine recreational beaches will be eligible for monitoring when the BEACH Program has funding to cover monitoring costs or when funding is covered through an alternative source. In any case, the BEACH Program will monitor major pollution events which pose a human health risk as determined by the BEACH Coordinator in cooperation with the site manager. The BEACH Coordinator will work with local health authorities and site managers to determine the preferred authority for sample collection and analysis of water quality samples. When funding is available, the BEACH Program will fund sample collection and analysis through grant agreements. Program direction and guidance will be incorporated into the agreements.

Tier III – Marine recreational beaches will be eligible for monitoring when major pollution events pose a human health risk as determined by the BEACH Coordinator in cooperation with site manager. When a major pollution event has occurred and human health and safety is at risk, the BEACH Program will fund sample collection and analysis through grant agreements if necessary. The BEACH Coordinator will work with local health authorities and site managers to determine the preferred authority for sample collection and analysis of water quality samples. Program direction and guidance will be incorporated into the agreements.

The BEACH Coordinator will work with local health authorities and site managers to design the preferred monitoring program for Tier I sites and Tier II sites if funding is available. The BEACH Program will support water quality sample collection by county health officials, site managers, volunteers, or others as appropriate. All sample collection will follow protocols outlined in **Appendix B** and samples will be taken to state accredited laboratories for analysis.

## 2.0 Water quality

### 2.1 Threshold guidance

These thresholds are recommended as guidelines to be used for monitoring marine recreational beaches to increase human health and safety. They are meant to be used as a tool along with knowledge of potential or actual pollution problems at the recreational beach to maintain the State of Washington's waters in a condition which will limit health and safety risks. These water quality guidelines have been developed by the BEACH Committee using *Guidance for Recreational Waters and Beaches*<sup>1</sup> July 2001, *National Beach Guidance and Required Performance Criteria for Grants*<sup>2</sup>, applicable State of Washington laws, and a technical BEACH Water Quality Assessment Workgroup. Appendix C contains a list of resource materials for recreation managers to address health and safety concerns.

#### **Microbiological Standards – Marine Water**

##### **(a) Bacteria**

The **minimum** advisory level protective bacteriological standards for marine recreational beaches used for primary contact recreation shall be as follows:

- (1) Based on a single sample, the density of bacteria in water from each sampling station shall not exceed:
  - (A) 104 enterococci bacteria colonies per 100 milliliters<sup>3</sup>, or
  - (B) 200 fecal coliform bacteria colonies per 100 milliliters.<sup>4</sup>
- (2) Based on the geometric mean of results from a minimum of five weekly samples (including any additional samples) the density of bacteria in water from any sampling station shall not exceed:
  - (A) 35 enterococci bacteria colonies per 100 milliliters, or
  - (B) 100 fecal coliform bacteria colonies per 100 milliliters.

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<sup>1</sup>Appendix C

<sup>2</sup> USEPA. 2002 *National Beach Guidance and Required Performance Criteria for Grants*. EPA-823-B-02-004. June 2002. U.S. Environmental Protection Agency, Office of Water, Washington, DC.

<sup>3</sup> Enterococcus gives the best correlation between indicator levels and illness rates, thus EPA requires states receiving BEACH Act Grants to use it as an indicator for marine waters. EPA's criterion is based upon an "Acceptable Swimming Associated Gastroenteritis Rate" of 19 cases/1000 swimmers.

<sup>4</sup> The BEACH Committee recognized financial concerns voiced by counties which monitor for fecal coliform due to required shellfish monitoring. Understanding the weak correlation between illness rates associated with water contact and density of fecal coliform, the BEACH committee recommends the use of enterococci for management of marine recreational beaches. However, the Committee wanted to give counties a reference for fecal numbers since monitoring for both enterococci and fecal coliform can be financially prohibitive.



The **critical** warning level protective bacteriological standards for coastal marine waters used for primary contact recreation shall be as follows:

(3) Based on a single sample, the density of bacteria in water from each sampling station shall not exceed:

(A) 276 enterococci bacteria colonies per 100 milliliters<sup>1</sup>, or

(B) 400 fecal coliform bacteria colonies per 100 milliliters.

**(b) Phytoplankton**

Toxic phytoplankton contains biotoxins that are harmful to humans, such as domoic acid and saxitoxin. Primary concern is for ingestion of shellfish feeding on toxic algae, however, the hazards from direct contact is relatively unknown.

The minimum protective phytoplankton standards for coastal marine waters used for primary contact recreation should be as follows:

(1) Biotoxin:

(A) Toxin levels are assessed from bioassays. Bioassays primarily conducted around shellfish beds by the Department of Health, but may be requested. Threshold toxin levels have been established for shellfish consumption, but not for contact.

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<sup>1</sup> This number is derived from EPA's upper 90 % confidence level.

## 2.2 Monitoring

- (a) Water quality will be monitored for bacteria using enterococci as the indicator.
- (b) The BEACH Committee will have water samples analyzed for fecal coliform in addition to enterococci when the results would be beneficial for historical reference of specific sites.
- (c) Monitoring for other biological, chemical, and physical hazards will be done when feasible.
- (c) Water quality samples shall follow the Monitoring and Notification Protocol, **Figure 2-1**, and shall be submitted to a state-accredited laboratory for analysis using methods outlined in **Appendix B**.
- (d) Standard operating procedures, quality control guidelines, training plans, and data quality objectives shall be followed as outlined in **Appendix B**.

## 2.3 Predictive Tools

- (a) When possible, samples will be taken after ½ inch of rain has fallen in 24 hours. Rain event data including historic fecal coliform counts will be analyzed to determine if preemptive rain advisories should be issued.
- (b) The BEACH Committee will compare the use of geometric means with the use of ninetieth percentiles as statistical methods for evaluating bacteria levels for long-term advisories. The BEACH Committee will review and/or develop water contact standards appropriate for the indicator and statistics used.
- (c) The BEACH Web site will be used to notify the public of applicable pollution events.

## 2.4 Figure 2 – 1 Monitoring and notification protocol:

	When to conduct basic sampling	When to conduct additional sampling	Where to collect samples	What depth to sample	Notification
<b>Tier I</b>	<p>Year round or at least one month prior to start of recreational season.</p> <p>Sample weekly at a minimum, throughout the recreational season.</p> <p>Once per month to acquire baseline.</p>	<p>To determine reopening or cancellation of advisory.</p> <p>Additional water samples shall be taken as soon as possible when:</p> <p>Sample results exceed the water quality standard,</p> <p>After a major pollution event where bacteria standards may exceed water quality standards,</p> <p>After ½ inch of rainfall in 24 hours.</p>	<p>Middle of typical recreation area.</p> <p>Every 200 yards from potential pollution source up to 600 yards and limited to locations where recreational access occurs or preferred locations determined by BEACH Coordinator based on site specific conditions.</p>	<p>Sample taken in knee deep waters 2-8 inches below the surface.</p> <p>NOTE:</p> <p>Sampling in this area may not accurately reflect water quality conditions affecting nearshore recreation such as surfing, diving, etc.</p>	<p>Advisory: Above minimum bacteria standard</p> <p>Major pollution event occurs,</p> <p>Preemptive Advisory when historic WQ monitoring results show correlation with rain events.</p> <p>Warning: Above critical bacteria standard</p>
<b>Tier II</b>	<p>Year round or at least one month prior to start of recreation season.</p> <p>Sample a minimum of once per month, weekly if possible.</p>	<p>To determine reopening or cancellation of advisory.</p> <p>Additional water samples shall be taken as soon as possible when:</p> <p>Sample results exceed the water quality standard,</p> <p>After a major pollution event where bacteria standards may exceed water quality standards,</p> <p>May be sampled following heavy rainfall events that may have flushed high bacteria concentrations into receiving waters.</p>	<p>Middle of typical recreation area.</p> <p>Near potential pollution source.</p> <p>Every 200 yards from potential pollution source up to 600 yards and limited to locations where recreational access occurs or preferred locations determined by BEACH Coordinator based on site specific conditions.</p>	<p>Sample taken in knee deep waters 2-8 inches below the surface.</p> <p>NOTE:</p> <p>Sampling in this area may not accurately reflect water quality conditions affecting nearshore recreation such as surfing, diving, etc.</p>	<p>Advisory: Above minimum bacteria standard</p> <p>Major pollution event occurs,</p> <p>Preemptive Advisory when historic WQ monitoring results show correlation with rain events.</p> <p>Warning: Above critical bacteria standard</p>
<b>Tier III</b>	<p>After a major pollution event where potential exists that indicator levels may be expected to exceed standard (sewage leak or spill) and human health safety is at risk.</p>	<p>To determine reopening or cancellation of advisory.</p> <p>Additional water samples shall be taken as soon as possible when:</p> <p>Sample results exceed the water quality standard;</p>	<p>Middle of typical recreation area.</p> <p>Near pollution source.</p> <p>Every 200 yards from potential pollution source up to 600 yards and limited to locations where recreational access occurs or preferred locations determined by BEACH Coordinator based on site specific conditions.</p>	<p>Sample taken in knee deep waters 2-8 inches below the surface.</p>	<p>Advisory: Above minimum bacteria standard</p> <p>Major pollution event occurs,</p> <p>Preemptive Advisory when historic WQ monitoring results show correlation with rain events.</p> <p>Warning: Above critical bacteria standard</p>

See **Appendix B** for standard operating procedures, quality control guidelines, training plans, and data quality objectives.

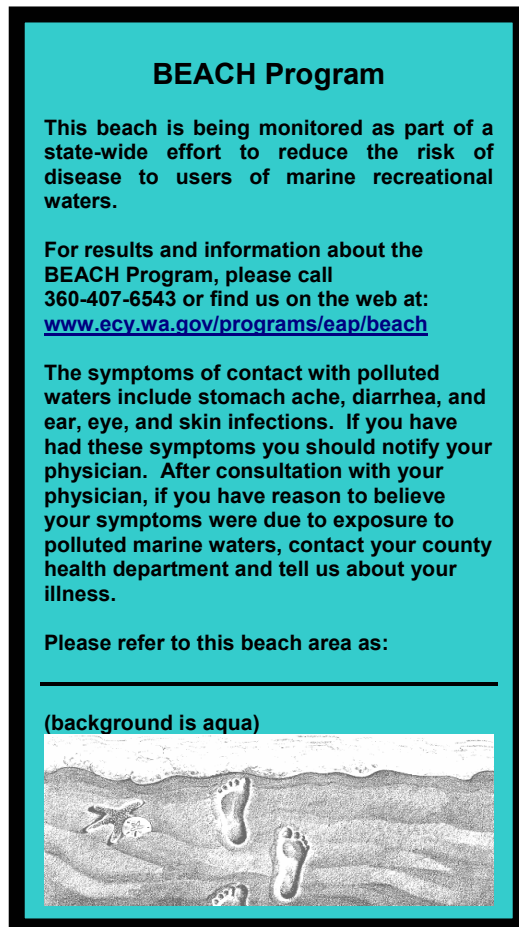
### 3.0 Advisory and notification procedures

Reducing the risk of disease to users of Washington's marine recreational beaches will occur as a result of informing local health authorities and the public of the BEACH Program's monitoring efforts, increased risk associated with increasing bacteria densities, notifying them of major pollution events, and increasing their awareness of recurring potential pollution problems. Information will be presented to the public via a marine recreational beach Web site, telephone hotline, BEACH database, and continued public involvement in the BEACH Program evaluation process.

#### 3.1 BEACH Program notification

- (a) Signs informing the public of the BEACH Program, **Figure 3 – 1**, may be posted at access points to coastal recreational waters which have been designated as Tier I and Tier II when alternative funding is available.

**Figure 3 – 1**                      **18" x 24"**



- (b) Educational outreach will occur through a kick-off campaign, pamphlets, outreach to volunteer groups, and other outreach efforts.

### 3.2 Advisory

(a) **Advising** the public of applicable risk will occur when:

- Sample results are above minimum microbiological threshold limits, or
- Pollution event creates a human health risk.

(b) **Advising** the public of chronic pollution conditions and preemptive advisories will be considered further by the BEACH Committee during the evaluation phase of the Program. The Committee will use data collected via the BEACH monitoring program, as well as available historic information, to address this issue. The Committee will compare the use of geometric means with the use of ninetieth percentiles as statistical methods for evaluating bacteria levels for long-term advisories. The Committee will review and/or develop water contact standards appropriate for the indicator and statistics used.

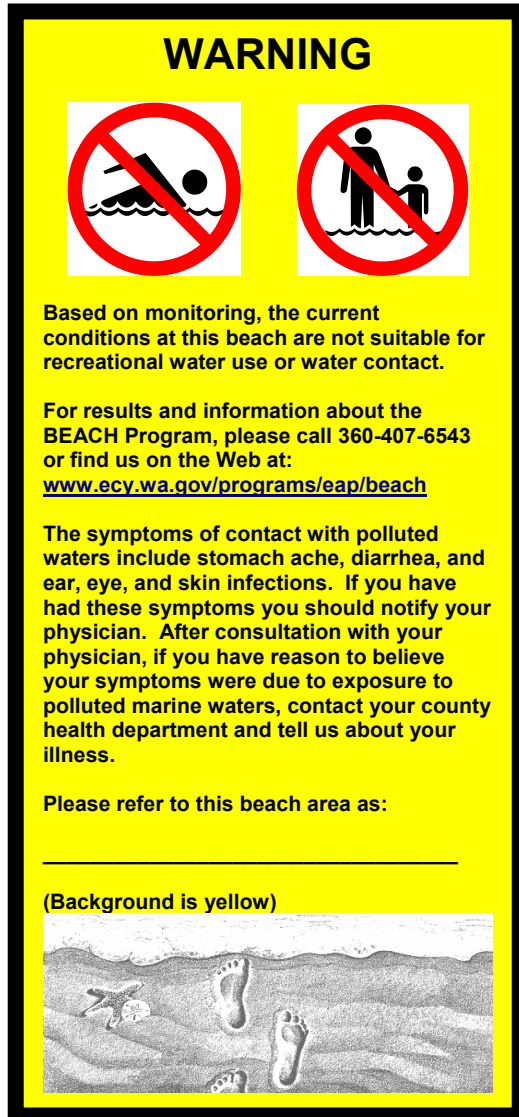
**Appendix D** identifies resources for addressing chronic pollution problems.

(c) **Advisory Notification**

- Notify the public through Washington's BEACH Web site,
- Notify the public through Washington's BEACH telephone hotline,
- Post signs, **Figure. 3 -2**, at points of water access,
- Notify local health authority,
- Notify beach manager, and
- Notify EPA's Administrator through Ecology's annual report.

Figure 3 – 2

18" x 24"



**Note:** Appendix D provides resource information for addressing pollution problems.

### 3.3 Warning

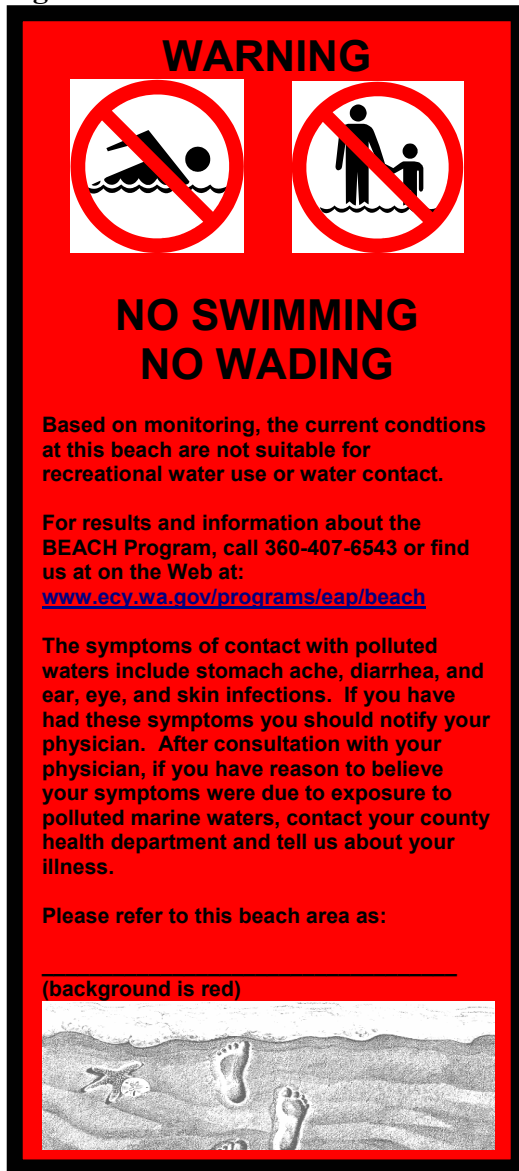
(a) **Warning** the public of applicable risk will result when:

- Sample results are above critical microbiological threshold limits, or
- When the BEACH Committee or an epidemiological team and site management determine water quality may critically jeopardize human health safety.

(b) **Warning Notification**

- Notify the public through State of Washington's BEACH Web site,
- Notify the public through State of Washington's BEACH telephone hotline,
- Post signs, **Figure 3 -3**, at points of water access,
- Notify local health authority,
- Notify beach manager,
- Notify non-English speaking users of marine recreational beaches through local education efforts when relevant,
- Notify the public through mass media campaign, and
- Notify EPA's Administrator through Ecology's annual report.

Figure 3 – 3 18" x 24"



**Note: Appendix D** provides resource information for addressing pollution problems.



### 3.4 Closure

**Note: Closure action or other emergency action may only be taken by the local health officer under RCW 70.05.070, Local health Officer - Powers and Duties.**

**WAC 246-260-180 Bathing beaches.** No bathing beach shall be maintained or operated when such water is determined by the health officer to be so polluted or subject to pollution as to constitute a menace to health if used for bathing. Where bathhouse and toilet facilities are provided for use of bathers they shall be constructed, maintained and operated in a sanitary manner approved by the health officer.

**(RCW 70.05.070 and WAC 246-260-180 are presented in Appendix E.)**

#### (a) Closure

The public beach may be **closed by the local health officer** or local beach manager for any of the following conditions or combinations thereof:

- Human health or safety is jeopardized when water quality does not meet threshold limits,
- Bacteriological water quality monitoring results are above critical threshold limits,
- Reports of illness, supported by sufficient epidemiological information, that indicate a significant risk associated with a specific recreational beach area,
- Reports of upper respiratory infections, skin infection, and skin irritation may result in closure, official warning or swimmer advisories depending on the circumstances,
- Confirmed reports of sewage system failure, or
- Any other condition that is determined to be a significant health threat.

The length of closure depends on the severity of the risk as evaluated by the local health officer and the ability of the recreational facility to reduce the identified risk.

**Note:** The above causes may be considered bases for convening an epidemiological team. This team, which includes the local health officer, will evaluate the seriousness of the conditions and strength of the data. The local health officer will consider the specific illness reported and the number of persons ill in determining the nature of the response.

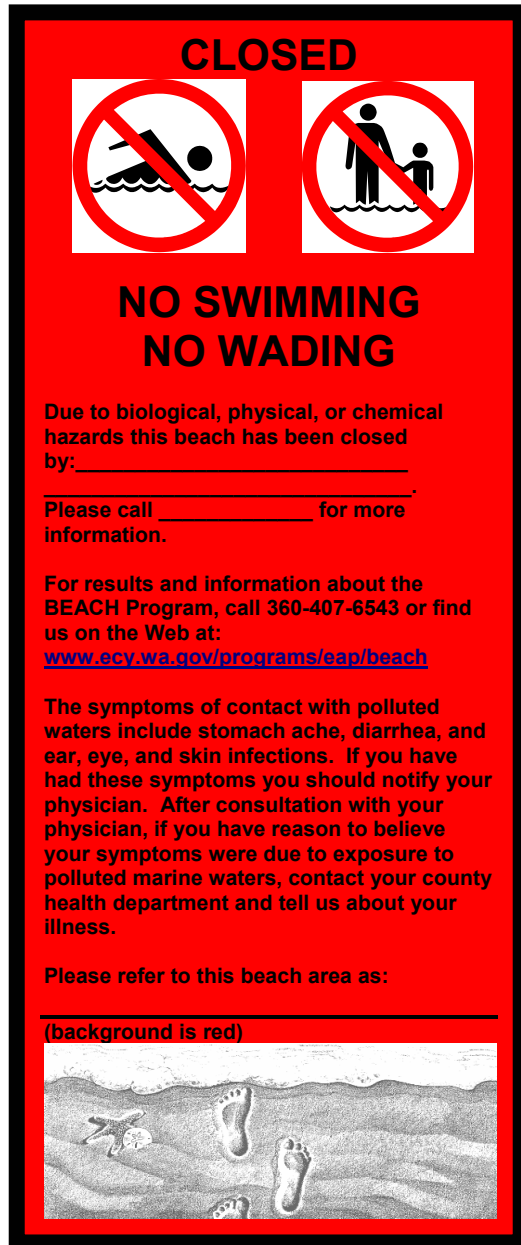
**Other Actions:** Actions which resolve or correct the health risk may be taken to avoid the area closure when such actions eliminate or significantly reduce the identified risk factor(s).

**(c) Closure notification**

The BEACH Program will supply signage for the local health officer and recommends the following actions:

- Notify the public through State of Washington's BEACH Web site,
- Notify the public through State of Washington's BEACH telephone hotline,
- Post signs, **Figure 3 -4**, at points of water access,
- Notify local health authority,
- Notify beach manager,
- Notify non-English speaking users of marine recreational beaches through local education efforts when relevant,
- Notify the public through mass media campaign, and
- Notify EPA's Administrator through Ecology's annual report.

Figure 3 – 4                      18" x 24"



**Note: Appendix D** provides resource information for addressing pollution problems.

## 4.0 Procedures for removing advisories and reopening recreational beaches

(a) **Advisory** and **Warning** notices will remain in effect until minimum water quality standards have been attained using these criteria:

- **Microbiological:** indicator levels are below applicable bacteriological standards,
- **Phytoplankton contamination:** compliance may be determined as a result of visual inspection and/or bioassay,
- **Fecal contamination:** compliance may be determined as a result of water quality analysis to determine if human health hazard exist,
- Recreation sites with recurring **Advisories** or **Warnings** should have a sanitary survey completed. (**Appendix D** provides resource information).

### (b) Reopening Recreation Sites

After a site **Closure**, the local health officer may reopen the area when:

- Microbiological sample results are below critical threshold limits,
- A sanitary survey of the closed area indicates risk factors are controlled (**Appendix D** provides resource information),
- Illness is absent or significantly reduced and the local health officer determines conditions are acceptable for reopening, or
- Risk factors are significantly reduced or eliminated and the local health officer determines conditions are acceptable for reopening.

**Note Regarding Possible Extended Closure:** If the local health officer finds that existing illness could cause significant risk to public health, a beach may be required to remain closed even if bacteria indicators are found below recommended reopening levels. Examples are illnesses caused by *Shigella sonnei*, *E. coli* 0157:H7, certain other pathogenic *E. coli*, Hepatitis A, or other viral agents.

## Appendix A

### Definitions

**Advisory:** Notices to the public informing them of risks associated with current coastal recreational water conditions.

**BEACH List:** A list of coastal marine recreational beaches located in the State of Washington prioritized according to density of users, water quality, public input, point source pollution, nonpoint source pollution, rainfall, extent of water contact when recreating, numbers of children in the water, and limited coastal recreation activities.

**BEACH Program:** Beach Environmental Assessment, Communication, and Health Program.

**BEACH Program Committee:** The inter-agency committee convened to address issues relating to human health and safety associated with coastal marine recreation sites listed on the BEACH List. Representatives from the State of Washington's Departments of Ecology, Health, and Natural Resources; its Parks and Recreation Commission and Puget Sound Action Team; local healthcare authorities, and other interested parties will comprise the committee.

**BEACH Program Coordinator:** Person responsible for coordination of BEACH Committee, training of monitoring staff, database management, and program implementation and oversight.

**Closure:** The action taken by a local county health authority to ensure public safety in the event that the local county health authority has deemed the coastal recreation site as unsafe for water contact recreation. Public notification will be communicated via signage, Internet web site, telephone hotline, and/or mass media.

**Data Quality Objectives (DQOs):** The qualitative and quantitative statements derived from the DQO Process that clarifies study's technical and quality objectives, define the appropriate type of data, and specify tolerable levels of potential decision errors that will be used as the basis for establishing the quality and quantity of data needed to support decisions.

**Data Quality Objective Process (DQO Process):** A systematic planning tool based on the scientific method that identifies the type, quality, and quantity of data needed to satisfy a specific use. DQOs are the qualitative and quantitative outputs from the DQO Process.

**Enterococcus:** Refers to a subgroup of the fecal streptococci that includes *S. faecalis*, *S. faecium*, *S. gallinarum*, and *S. avium*. Enterococci are differentiated from other streptococci by their ability to grow in 6.5% sodium chloride, at pH 9.6 and at 10°C and 45°C.

**Epidemiological Team:** A team consisting of an epidemiologist, local health officer, environmental health staff, personal health staff, and/or laboratory staff that convenes when necessary to investigate suspected recreational waterborne illness outbreaks. In addition, the Team evaluates the strength of available data and recommends appropriate preventive measures.

**Fecal Coliform:** That portion of the coliform group which is present in the intestinal tracts and feces of warm-blooded animals as detected by the product of acid or gas from lactose in a suitable culture medium within twenty-four hours at 44.5°C plus or minus 0.2°C.

**Geometric Mean:** Either the  $n^{\text{th}}$  root of a product of  $n$  factors, or the antilogarithm of the arithmetic mean of the logarithms of the individual sample values.

**Local Health Officer:** Appointed local health officer, acting under the direction of the local Board of Health or under direction of the administrative officer appointed under RCW 70.50.035, if any, that has the powers and duties as defined in RCW 70.50.070.

**Nonpoint Source Pollution:** Pollution that enters any waters of the state from any dispersed land-based or water-based activities, including, but not limited to, atmospheric deposition; surface water runoff from agricultural lands, urban areas, or forest lands; subsurface or underground sources; or discharges from boats or marine vessels not otherwise regulated under the National Pollutant Discharge Elimination System program.

**Posting:** The placement of informational signs at the entrance to public recreational beaches or at water access points.

**Public Marine Recreational Beach:** Beaches or recreational sites with coastal marine waters including coastal estuaries that are designated under Clean Water Act (CWA) Section 303(c) for use as primary contact recreation and which the owner holds open to the public for uses including, but not limited to, skin diving, swimming, surfing, wading, recreational shellfish harvesting, and water skiing.

**Pollution:** Such contamination (or other alteration of the physical, chemical, or biological properties of any waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters), or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish, or other aquatic life.

**Quality Assurance (QA):** An integrated management system designed to ensure that a product and/or service meet defined standards of quality with a stated level of confidence. QA activities involve planning quality control, quality assessment, reporting, and quality improvement.

**Quality Assurance Project Plan (QAPP):** A formal document describing in comprehensive detail the necessary quality assurance procedures, quality control activities, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance or acceptance criteria.

**Quality Control (QC):** The overall system of technical activities that measure the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer, operational techniques and activities that are used to fulfill requirements for quality.

**RCW 70.50.070** is presented in **Appendix E**.

**Recreational Season:** Recreational season for whole body bathing will generally run from Memorial Day to Labor Day for the general public. Recreational activities which occur during times other than Memorial Day to Labor Day will be monitored a month prior to the start of high-frequency use through the end of the normal use period. It is possible for the recreational season for some activities to be year-round.

**Standard Operating Procedures (SOPs):** A document that details the method for an operation, analysis, or action with thoroughly prescribed techniques and steps to be followed. It is officially approved as the method for performing certain routine or repetitive tasks.

**WAC 246-260-180** is presented in **Appendix E**.

**Warning:** Notices to the public informing them of risks associated with current coastal recreational water conditions.

## Appendix B

### Water monitoring protocols

<b>Marine Water</b>	
<b>FECAL COLIFORM</b>	
Fecal Coliform by Multiple Tube Fermentation (MTF) Using m-FC	SM 9221 C, E
Fecal Coliform by Membrane Filtration (MF) Using m-FC	SM 9222 D
<b>ENTEROCOCCI</b>	
Enterococci by Membrane Filtration (MF) Using mEI or mE	SM 9230 C EPA Method 1600 or 1106.1

#### **Standard operating procedures (SOP)**

The BEACH Committee will support a workgroup to design, write, and evaluate the SOP.

#### **Quality assurance project plan (QAPP)**

The BEACH Committee will support a workgroup to design, write, and evaluate the QAPP.

#### **Data quality objectives (DQO)**

The BEACH Committee will support a workgroup to design, write, and evaluate the DQO.

#### **Training plan for monitoring staff**

A training plan will be developed and implemented for parties involved with water sampling collection and transportation of samples to state accredited laboratories. This will ensure uniform sampling for the BEACH Program.

#### **Data management**

Data will be managed by the Department of Ecology (Ecology). Ecology will develop a database which will store incoming monitoring results from the field. The BEACH Coordinator will analyze the data and ensure timely communication to the public of results above threshold limits. Ecology will coordinate with EPA to develop a method for adding data to EPA's STORET database.



## Appendix C

### Health and safety guides and resources

- *Recreational Waters and Beaches Resource Guide*, Washington State Department of Health and Environmental Health Directors' Living Environmental Committee, 2001. Washington State Department of Health, Tumwater, Washington.

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- **Appendix D**

### **Resources for addressing pollution problems**

#### **Sanitary Surveys**

See Section 3 of the *Guidance of Recreational Waters and Beaches*, **Appendix C**.

#### **EPA**

EPA offers training for individuals conducting sanitary surveys. Its website offers some online information.

**URL: <http://www.epa.gov/safewater/dwa/sanitary.html>**

#### **Environmental Pollution Information**

##### **Surfrider Foundation**

Surfrider's website has information about pollution problems and possible solutions.

**URL: <http://www.surfrider.org/a-z/index.htm>**

#### **Nonpoint Source Pollution**

##### **County Conservation Districts**

The Washington State Conservation Commission and the local county districts offer support for environmental pollution problems. You can reach your county through its website:

**URL: <http://www.nacdnet.org/resources/WA.htm>**

#### **Health**

State of Washington Department of Health has a page on the Internet that gives information related to a wastewater management program.

**URL: <http://www.doh.wa.gov/ehp/ts/waste.htm>**

County Health Departments can be a good source for information:

**URL: <http://www.doh.wa.gov/LHJMap/LHJMap.htm>**

#### **Ecology**

Ecology has a page on the Internet that gives information related to water quality issues including possible funding sources. The BEACH Program is listed as an action in the State of Washington's Nonpoint Plan, and thus eligible for water quality funding through Ecology's grant & loan program.

**URL: <http://www.ecy.wa.gov/services.html>**

## **USDA**

United States Department of Agriculture includes the Natural Resources Conservation Service which offers technical support for conservation needs:

**URL: [http://www.wa.nrcs.usda.gov/Cons\\_Assist/CTA.htm](http://www.wa.nrcs.usda.gov/Cons_Assist/CTA.htm)**

## **Point Source Pollution**

To find locations of discharge facilities use:

### **Ecology**

**URL: <http://www.ecy.wa.gov/website/facsite/viewer.htm>**

### **Health**

**URL: <http://www.doh.wa.gov/ehp/sf/sf10maps.htm>**

## **Possible Funding Sources:**

### **Rural Development**

The US Department of Agriculture supports rural loan programs:

**URL: <http://www.rurdev.usda.gov/>**

### **County Conservation Districts**

The Washington State Conservation Commission and their local county offices offer support for environmental pollution problems. You can reach your county through their website:

**URL: <http://www.nacdnet.org/resources/WA.htm>**

### **Ecology**

Ecology has a page on the Internet that gives information related to water quality issues including possible funding sources.

**URL: <http://www.ecy.wa.gov/services.html>**

### **EPA**

Information about EPA's Clean Water State Revolving Fund Program, managed by Ecology, can be found at:

**URL: <http://www.epa.gov/owm/cwfinance/cwsrf/basics.htm>**

**Appendix E**  
**RCW 70.05.070**  
**RCW 70.90.120**  
**WAC 173-201A-030 (pending revisions in 2002/2003)**  
**WAC 246-260-180**

**RCW 70.05.070****Local health officer -- Powers and duties.**

The local health officer, acting under the direction of the local board of health or under direction of the administrative officer appointed under RCW 70.05.040 or 70.05.035, if any, shall:

(1) Enforce the public health statutes of the state, rules of the state board of health and the secretary of health, and all local health rules, regulations and ordinances within his or her jurisdiction including imposition of penalties authorized under RCW 70.119A.030, the confidentiality provisions in RCW 70.24.105 and rules adopted to implement those provisions, and filing of actions authorized by RCW 43.70.190;

(2) Take such action as is necessary to maintain health and sanitation supervision over the territory within his or her jurisdiction;

(3) Control and prevent the spread of any dangerous, contagious or infectious diseases that may occur within his or her jurisdiction;

(4) Inform the public as to the causes, nature, and prevention of disease and disability and the preservation, promotion and improvement of health within his or her jurisdiction;

(5) Prevent, control or abate nuisances which are detrimental to the public health;

(6) Attend all conferences called by the secretary of health or his or her authorized representative;

(7) Collect such fees as are established by the state board of health or the local board of health for the issuance or renewal of licenses or permits or such other fees as may be authorized by law or by the rules of the state board of health;

(8) Inspect, as necessary, expansion or modification of existing public water systems, and the construction of new public water systems, to assure that the expansion, modification, or construction conforms to system design and plans;

(9) Take such measures as he or she deems necessary in order to promote the public health, to participate in the establishment of health educational or training activities, and to authorize the attendance of employees of the local health department or individuals engaged in community health programs related to or part of the programs of the local health department.

[1999 c 391 § 5; 1993 c 492 § 239; 1991 c 3 § 309; 1990 c 133 § 10; 1984 c 25 § 7; 1979 c 141 § 80; 1967 ex.s. c 51 § 12.]

**RCW 70.90.120****Adoption of rules governing safety, sanitation, and water quality -- Exceptions.**

(1) The board shall adopt rules under the administrative procedure act, chapter [34.05](#) RCW, governing safety, sanitation, and water quality for water recreation facilities. The rules shall include but not be limited to requirements for design; operation; injury and illness reporting; biological and chemical contamination standards; water quality monitoring; inspection; permit application and issuance; and enforcement procedures. However, a water recreation facility intended for the exclusive use of residents of any apartment house complex or of a group of rental housing units of less than fifteen living units, or of a mobile home park, or of a condominium complex or any group or association of less than fifteen home owners shall not be subject to preconstruction design review, routine inspection, or permit or fee requirements; and water treatment of hydroelectric reservoirs or natural streams, creeks, lakes, or irrigation canals shall not be required.

(2) In adopting rules under subsection (1) of this section regarding the operation or design of a recreational water contact facility, the board shall review and consider any recommendations made by the recreational water contact facility advisory committee.

**WAC 173-201A-030**

**General water use and criteria classes.** The following criteria shall apply to the various classes of surface waters in the state of Washington:

**(1) Class AA (extraordinary).**

(a) General characteristic. Water quality of this class shall markedly and uniformly exceed the requirements for all or substantially all uses.

(b) Characteristic uses. Characteristic uses shall include, but not be limited to, the following:

(i) Water supply (domestic, industrial, agricultural).

(ii) Stock watering.

(iii) Fish and shellfish:

Salmonid migration, rearing, spawning, and harvesting.

Other fish migration, rearing, spawning, and harvesting.

Clam, oyster, and mussel rearing, spawning, and harvesting.

Crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing, spawning, and harvesting.

(iv) Wildlife habitat.

(v) Recreation (primary contact recreation, sport fishing, boating, and aesthetic enjoyment).

(vi) Commerce and navigation.

(c) Water quality criteria:

(i) Fecal coliform organisms:

(A) Freshwater - fecal coliform organism levels shall both not exceed a geometric mean value of 50 colonies/100 mL and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 100 colonies/100 mL.

(B) Marine water - fecal coliform organism levels shall both not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 43 colonies/100 mL.

(ii) Dissolved oxygen:

- (A) Freshwater - dissolved oxygen shall exceed 9.5 mg/L.
- (B) Marine water - dissolved oxygen shall exceed 7.0 mg/L. When natural conditions, such as upwelling, occur, causing the dissolved oxygen to be depressed near or below 7.0 mg/L, natural dissolved oxygen levels may be degraded by up to 0.2 mg/L by human-caused activities.
- (iii) Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection.
- (iv) Temperature shall not exceed 16.0°C (freshwater) or 13.0°C (marine water) due to human activities. When natural conditions exceed 16.0°C (freshwater) and 13.0°C (marine water), no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3°C.  
Incremental temperature increases resulting from point source activities shall not, at any time, exceed  $t=23/(T+5)$  (freshwater) or  $t=8/(T-4)$  (marine water). Incremental temperature increases resulting from nonpoint source activities shall not exceed 2.8°C.  
For purposes hereof, "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.
- (v) pH shall be within the range of 6.5 to 8.5 (freshwater) or 7.0 to 8.5 (marine water) with a human-caused variation within the above range of less than 0.2 units.
- (vi) Turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.
- (vii) Toxic, radioactive, or deleterious material concentrations shall be below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department (see **WAC 173-201A-040** and **173-201A-050**).
- (viii) Aesthetic values shall not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste.

**(2) Class A (excellent).**

- (a) General characteristic. Water quality of this class shall meet or exceed the requirements for all or substantially all uses.
- (b) Characteristic uses. Characteristic uses shall include, but not be limited to, the following:
  - (i) Water supply (domestic, industrial, agricultural).
  - (ii) Stock watering.
  - (iii) Fish and shellfish:
    - Salmonid migration, rearing, spawning, and harvesting.
    - Other fish migration, rearing, spawning, and harvesting.
    - Clam, oyster, and mussel rearing, spawning, and harvesting.
    - Crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing, spawning, and harvesting.
  - (iv) Wildlife habitat.
  - (v) Recreation (primary contact recreation, sport fishing, boating, and aesthetic enjoyment).
  - (vi) Commerce and navigation.
- (c) Water quality criteria:
  - (i) Fecal coliform organisms:
    - (A) Freshwater - fecal coliform organism levels shall both not exceed a geometric mean value of 100 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the

geometric mean value exceeding 200 colonies/100 mL.

(B) Marine water - fecal coliform organism levels shall both not exceed a geometric mean value of 14 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 43 colonies/100 mL.

(ii) Dissolved oxygen:

(A) Freshwater - dissolved oxygen shall exceed 8.0 mg/L.

(B) Marine water - dissolved oxygen shall exceed 6.0 mg/L. When natural conditions, such as upwelling, occur, causing the dissolved oxygen to be depressed near or below 6.0 mg/L, natural dissolved oxygen levels may be degraded by up to 0.2 mg/L by human-caused activities.

(iii) Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection.

(iv) Temperature shall not exceed 18.0°C (freshwater) or 16.0°C (marine water) due to human activities. When natural conditions exceed 18.0°C (freshwater) and 16.0°C (marine water), no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3°C.

Incremental temperature increases resulting from point source activities shall not, at any time, exceed  $t=28/(T+7)$  (freshwater) or  $t=12/(T-2)$  (marine water). Incremental temperature increases resulting from nonpoint source activities shall not exceed 2.8°C.

For purposes hereof, "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

(v) pH shall be within the range of 6.5 to 8.5 (freshwater) or 7.0 to 8.5 (marine water) with a human-caused variation within the above range of less than 0.5 units.

(vi) Turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background turbidity is more than 50 NTU.

(vii) Toxic, radioactive, or deleterious material concentrations shall be below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department (see [WAC 173-201A-040](#) and [173-201A-050](#)).

(viii) Aesthetic values shall not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste.

### (3) **Class B (good).**

(a) General characteristic. Water quality of this class shall meet or exceed the requirements for most uses.

(b) Characteristic uses. Characteristic uses shall include, but not be limited to, the following:

(i) Water supply (industrial and agricultural).

(ii) Stock watering.

(iii) Fish and shellfish:

Salmonid migration, rearing, and harvesting.

Other fish migration, rearing, spawning, and harvesting.

Clam, oyster, and mussel rearing and spawning.

Crustaceans and other shellfish (crabs, shrimp, crayfish, scallops, etc.) rearing, spawning, and harvesting.

(iv) Wildlife habitat.

(v) Recreation (secondary contact recreation, sport fishing, boating, and aesthetic enjoyment).

(vi) Commerce and navigation.

(c) Water quality criteria:

(i) Fecal coliform organisms:

(A) Freshwater - fecal coliform organism levels shall both not exceed a geometric mean value of 200 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 400 colonies/100 mL.

(B) Marine water - fecal coliform organism levels shall both not exceed a geometric mean value of 100 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 200 colonies/100 ML.

(ii) Dissolved oxygen:

(A) Freshwater - dissolved oxygen shall exceed 6.5 mg/L.

(B) Marine water - dissolved oxygen shall exceed 5.0 mg/L. When natural conditions, such as upwelling, occur, causing the dissolved oxygen to be depressed near or below 5.0 mg/L, natural dissolved oxygen levels may be degraded by up to 0.2 mg/L by human-caused activities.

(iii) Total dissolved gas shall not exceed 110 percent of saturation at any point of sample collection.

(iv) Temperature shall not exceed 21.0°C (freshwater) or 19.0°C (marine water) due to human activities. When natural conditions exceed 21.0°C (freshwater) and 19.0°C (marine water), no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3°C.

Incremental temperature increases resulting from point source activities shall not, at any time, exceed  $t=34/(T+9)$  (freshwater) or  $t=16/(T)$  (marine water). Incremental temperature increases resulting from nonpoint source activities shall not exceed 2.8°C.

For purposes hereof, "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.

(v) pH shall be within the range of 6.5 to 8.5 (freshwater) and 7.0 to 8.5 (marine water) with a human-caused variation within the above range of less than 0.5 units.

(vi) Turbidity shall not exceed 10 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 20 percent increase in turbidity when the background turbidity is more than 50 NTU.

(vii) Toxic, radioactive, or deleterious material concentrations shall be below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department (see [WAC 173-201A-040](#) and [173-201A-050](#)).

(viii) Aesthetic values shall not be reduced by dissolved, suspended, floating, or submerged matter not attributed to natural causes, so as to affect water use or taint the flesh of edible species.

**(4) Class C (fair).**

(a) General characteristic. Water quality of this class shall meet or exceed the requirements of selected and essential uses.

(b) Characteristic uses. Characteristic uses shall include, but not be limited to, the following:

(i) Water supply (industrial).

(ii) Fish (salmonid and other fish migration).

(iii) Recreation (secondary contact recreation, sport fishing, boating, and aesthetic enjoyment).

(iv) Commerce and navigation.

(c) Water quality criteria - marine water:



- (i) Fecal coliform organism levels shall both not exceed a geometric mean value of 200 colonies/100 mL, and not have more than 10 percent of all samples obtained for calculating the geometric mean value exceeding 400 colonies/100 mL.
- (ii) Dissolved oxygen shall exceed 4.0 mg/L. When natural conditions, such as upwelling, occur, causing the dissolved oxygen to be depressed near or below 4.0 mg/L, natural dissolved oxygen levels may be degraded by up to 0.2 mg/L by human-caused activities.
- (iii) Temperature shall not exceed 22.0°C due to human activities. When natural conditions exceed 22.0°C, no temperature increases will be allowed which will raise the receiving water temperature by greater than 0.3°C.  
Incremental temperature increases shall not, at any time, exceed  $t=20/(T+2)$ .  
For purposes hereof, "t" represents the maximum permissible temperature increase measured at a mixing zone boundary; and "T" represents the background temperature as measured at a point or points unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge.
- (iv) pH shall be within the range of 6.5 to 9.0 with a human-caused variation within a range of less than 0.5 units.
- (v) Turbidity shall not exceed 10 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 20 percent increase in turbidity when the background turbidity is more than 50 NTU.
- (vi) Toxic, radioactive, or deleterious material concentrations shall be below those which have the potential either singularly or cumulatively to adversely affect characteristic water uses, cause acute or chronic conditions to the most sensitive biota dependent upon those waters, or adversely affect public health, as determined by the department (see **WAC 173-201A-040** and **173-201A-050**).
- (vii) Aesthetic values shall not be interfered with by the presence of obnoxious wastes, slimes, aquatic growths, or materials which will taint the flesh of edible species.

**WAC 246-260-180 Bathing beaches.** No bathing beach shall be maintained or operated when such water is determined by the health officer to be so polluted or subject to pollution as to constitute a menace to health if used for bathing. Where bathhouse and toilet facilities are provided for use of bathers they shall be constructed, maintained and operated in a sanitary manner approved by the health officer.

[Statutory Authority: RCW 43.20.050. 91-02-051 (Order 124B), recodified as § 246-260-180, filed 12/27/90, effective 1/31/91; Regulation .98.070, effective 3/11/60.]