September 20, 2007

Dear Interested Party:

Attached is the Final Supplemental Environmental Impact Statement: Bellingham Bay Comprehensive Strategy, Whatcom Waterway Cleanup Site (FSEIS) prepared in compliance with the State Environmental Policy Act (RCW 43.21C). The FSEIS analyzes and compares a range of remedial action alternatives for the cleanup of the Whatcom Waterway Site.

Key potential environmental impacts pertain to the Geology, Water and Environmental Health; Fish and Wildlife; and Land Use, Shoreline Use and Recreation/Public Use elements of the environment. Many of the proposed remedial action alternatives destabilize areas of the shoreline, eliminate existing habitat, and conflict with planned land uses resulting in net adverse impacts to the environment. Other alternatives stabilize areas of the shoreline, create new habitat, and are consistent with planned land uses resulting in a net beneficial impact.

This FSEIS incorporates changes made in response to public comments on the draft Supplemental EIS and includes a Responsiveness Summary as Appendix G.

Using information in the final Remedial Investigation & Feasibility Study for the Whatcom Waterway Site and the draft Supplemental EIS, and in consideration of public comments received, Ecology proposed one cleanup alternative as the final remedy for the Whatcom Waterway Site. This final remedy was described in a draft Cleanup Action Plan (CAP), which was issued for public review and comment (from July 12, 2007 to August 13, 2007) in conjunction with a draft legal agreement called a consent decree (Decree). The Decree outlines the terms under which the Port of Bellingham and three other parties liable for cleanup would implement the CAP. After addressing public comments received on the draft CAP and Decree, Ecology prepared a final CAP which is being issued concurrent with this FSEIS

For further information on the FSEIS, please contact Lucy McInerney of the Department of Ecology at 425-649-7272, at the address above, or e-mail lpeb461@ecy.wa.gov.

Sincerely,

Robert W. Warren, P.Hg., MBA
Regional Section Manager
Toxics Cleanup Program

lm/sa

# FACT SHEET

**Project Title:**

Bellingham Bay Comprehensive Strategy – Whatcom Waterway Cleanup Site.

**Proposed Action:**

The Proposed Action consists of the cleanup of the Whatcom Waterway Site, in accordance with requirements of the Model Toxics Control Act (MTCA) and Sediment Management Standards (SMS) regulations.

Cleanup of the Whatcom Waterway Site is one element of the Bellingham Bay Comprehensive Strategy, a bay-wide guidance document developed through the Bellingham Bay Demonstration Pilot (Pilot), a 14 member federal, state, local and tribal partnership. The Bellingham Bay Comprehensive Strategy was presented by the Department of Ecology (Ecology) in a Final Environmental Impact Statement in October of 2000.

On October 10, 2006, Ecology issued for public review and comment, a Draft Supplemental Remedial Investigation/Feasibility Study (RI/FS). The RI/FS evaluated eight potential cleanup alternatives for the Whatcom Waterway Site and identified preferred cleanup alternatives based on MTCA evaluation criteria. In parallel with the RI/FS, Ecology issued a Draft Supplemental EIS for public review and comment. That Draft Supplemental EIS evaluated potential environmental impacts associated with each of the eight remedial alternatives evaluated in the RI/FS document, and compared these to the impacts of a No Action alternative. The evaluation was conducted consistent with State Environmental Policy Act (SEPA) requirements. In addition to these regulatory requirements the Draft Supplemental EIS also evaluated consistency of the alternatives with the goals of the Bellingham Bay Demonstration Pilot. Following public review and comment, Ecology developed a Responsiveness Summary addressing comments received on both the RI/FS and the Draft Supplemental EIS.

Ecology has completed a Final Supplemental EIS (FSEIS) that incorporates changes made in response to public comments on the Draft Supplemental EIS. The Responsiveness Summary is attached as Appendix G of the FSEIS. Ecology has also approved the RI/FS as final.

Using information in the final RI/FS and the Draft Supplemental EIS, and in consideration of public comments received, Ecology proposed one cleanup alternative as the final remedy for the Whatcom Waterway Site. This final remedy was described in a draft Cleanup Action Plan (CAP), which was issued for public review and comment (from July 12, 2007 to August 13, 2007) as an exhibit to a draft legal agreement called a consent decree (Decree). The Decree outlines the terms under which the Port of Bellingham and three other parties liable for cleanup would implement the CAP.

Ecology has addressed public comments received on the draft Decree including the draft CAP, in a Responsiveness Summary, and has finalized the Decree. This Final Supplemental EIS is being issued jointly with the final Decree and Responsiveness Summary. The Decree will now be signed by Ecology and the parties implementing the cleanup and entered in Whatcom County Superior Court. The cleanup will then move forward into design permitting, construction and long-term monitoring.

**Project Location:**

The project is located within the inner, urbanized portion of Bellingham Bay. The Whatcom Waterway Site includes aquatic lands located within and around the Whatcom Creek Waterway navigation channel, located near downtown Bellingham.

**Proponent:**

Port of Bellingham
P.O. Box 1677
Bellingham, Washington 98227-1677

**Lead Agency:**

Washington State Department of Ecology
P.O. Box 47775
Olympia, Washington 98504-7775

**Responsible Official:**

Robert W. Warren, P.Hg., MBA
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**Required Approvals:**

The final cleanup described by Ecology in the Cleanup Action Plan and Consent Decree will require the following permits and other approvals:

- Federal Clean Water Act, Section 404 Permit (Corps of Engineers)
- Federal Clean Water Act Section 401 Water Quality Certification l (Department of Ecology) (required if generated wastewater cannot be discharged to the local sanitary sewer system)
- Federal Clean Water Act Section 402 National Pollutant Discharge Elimination System Permit (Department of Ecology)
- Washington State Scientific Collection Permit (Washington Department of Fish and Wildlife)

The cleanup action is exempt from the procedural requirements of the following state and local permits, however the substantive requirements will be followed.

- Hydraulic Project Approval (Washington Department of Fish and Wildlife)
- Shoreline Substantial Development (City of Bellingham)

**Authors and Principal Contributors:**

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**Date of Issue:**

September 20, 2007

**Cleanup Start Date:**

The anticipated start date for site cleanup is late 2009 or early 2010. This date is subject to project engineering design and permitting.

**Location of FSEIS and other documents available for review.**

Department of Ecology
Bellingham Field Office
1440-10th Street, Suite 102
(360) 715-5200

Bellingham Public Library
210 Central Avenue, Bellingham
(360) 676-6860

Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, Washington 98008-5452
(425) 649-7190 (Call for an appointment)

Ecology's Web Site:
http://www.ecy.wa.gov/programs/tcp/sites/blhm_bay/sites/bel_bay_sites.html

**Costs to the Public:**

An electronic copy of the FSEIS is available free of charge at Ecology's web site.

Printed copies can be obtained from Ecology subject to applicable reproduction charges.

# Final Supplemental Environmental Impact Statement: Bellingham Bay Comprehensive Strategy

## Whatcom Waterway Cleanup Site

**Prepared by:**

**The RETEC Group, Inc.**
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**Seattle, WA 98134-1162**

**RETEC Project Number: PORTB-18876**
**ENSR Project Number: 12529007-300**

**Prepared for:**

**Washington Department of Ecology**
**3190 160th Ave SE**
**Bellevue, Washington 98003**

## September 20, 2007

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# 1 Summary

This Final Supplemental Environmental Impact Statement (FSEIS) was prepared in accordance with the requirements of the State Environmental Policy Act (SEPA), as defined in WAC 197-11. This impact analysis evaluates and compares a range of remedial action alternatives for the cleanup of the Whatcom Waterway site in Bellingham.

This FSEIS incorporates changes made in response to public comments received on the *Draft Supplemental EIS* that was issued for public review (October 10, 2006 – December 13, 2006) jointly with a draft *Remedial Investigation & Feasibility Study* (RI/FS, RETEC 2006) for the Whatcom Waterway site. This FSEIS includes a Responsiveness Summary (Appendix G) addressing comments received on both documents.

Using information in the final RI/FS and the Draft Supplemental EIS, and in consideration of public comments received, Ecology proposed one cleanup alternative as the final remedy for the cleanup of the Whatcom Waterway site. This final remedy was described in a draft Cleanup Action Plan (CAP), which was issued for public review and comment (from July 12, 2007 to August 13, 2007) as an exhibit to a draft legal agreement called a consent decree (Decree).

Ecology has addressed public comments received on the draft Decree including the draft CAP, in a Responsiveness Summary, and has finalized the Decree. This FSEIS is being issued jointly with the final Decree and the Responsiveness Summary. The Decree will now be signed by Ecology and the parties implementing the cleanup, and entered in Whatcom County Superior Court. The cleanup will then move forward into design, permitting, construction and long-term monitoring.

This document was prepared consistent with the requirements of the State Environmental Policy Act (SEPA) regulations, as defined in WAC 197-11. In addition, this document provides an evaluation of proposed actions against a set of non-regulatory goals, developed by Ecology in conjunction with other regulatory and resource agencies, local governments, tribes, and project stakeholders as part of the Bellingham Bay Demonstration Pilot. Background regarding the Whatcom Waterway site and the Bellingham Bay Demonstration Pilot are provided in Sections 1.1 and 1.2 below. Subsequent sections of this summary describe the project regulatory context, and describe the evaluated project alternatives and the conclusions of the FSEIS.

## 1.1 Whatcom Waterway Project Background

The Whatcom Waterway site is located within Bellingham Bay (Figure 1-1). The site includes lands that have been impacted by contaminants historically released from industrial waterfront activities, including mercury discharges from the former Georgia Pacific (GP) chlor-alkali plant, as well as other industrial releases. A history of the site and surrounding area was provided in Section 2 of the Remedial Investigation report (Volume 1 of the RI/FS) and is summarized in Section 2.1 of this FSEIS.

The RI/FS process for the Whatcom Waterway site was initiated by Georgia Pacific under Ecology oversight. The RI/FS process was specified under MTCA Agreed Order DE 95TC-N399 and was initiated in 1996. The study included detailed sampling and analysis in 1996 and 1998, and subsequent sampling activities in 2002, 2003 and 2004. The site investigation data from these activities are described in the Remedial Investigation report (Volume 1 of the RI/FS).

In parallel with the RI/FS activities, a Bellingham Bay Comprehensive Strategy EIS was developed by an interagency consortium known as the Bellingham Bay Demonstration Pilot (Pilot). The Pilot brought together a cooperative partnership of agencies, tribes, local government, and businesses known collectively as the Pilot Work Group, to develop an approach for source control, sediment cleanup, and associated habitat restoration in Bellingham Bay. As part of the approach, the Pilot Work Group developed a Comprehensive Strategy that considered contaminated sediments, sources of pollution, habitat restoration, and in-water and shoreline land use from a bay-wide perspective. The strategy integrated this information to identify priority issues requiring action in the near-term and to provide long-term guidance to decision-makers. The Comprehensive Strategy was finalized in October 2000 as a *Final Environmental Impact Statement* and prepared under the State Environmental Policy Act (SEPA), as described in Section 1.2 below.

A previous version of the RI/FS was produced in 2000, alongside the production of the October 2000 Pilot EIS. That RI/FS addressed portions of the Whatcom Waterway site, but did not address the Aerated Stabilization (ASB) portion of the site (see Figure 1-1). However, since 2000, the Bellingham Waterfront has undergone a series of dramatic land use changes. Those changes have included but are not limited to the following:

- 2001 closure of the Georgia Pacific pulp mill and chemical plant
- 2005 sale of 137 acres of GP waterfront property to the Port
- Additional land use ownership changes in the Central Waterfront Area
- An area-wide shift from industrial to mixed-use development and zoning in waterfront areas.

The closure of the Georgia Pacific mill operations in 2001 necessitated the evaluation of ASB remediation options which had not been previously addressed by the RI/FS or EIS process. In 2002 a draft supplemental

Feasibility Study and EIS Supplement were completed but not finalized. Data collected subsequent to these 2002 documents and planned land use changes resulting from the Port's property acquisition in 2005 required the production of the 2006 RI/FS and EIS documents to address site decision-making requirements.

The 2006 RI/FS document integrates previous efforts and provides a comprehensive evaluation of site conditions and cleanup options. The document addresses current and anticipated land uses, and is performed consistent with the Agreed Order and its Amendments. This FSEIS evaluates environmental impacts associated with the RI/FS remedial alternatives, as well as a No Action Alternative.

## 1.2 Overview of the Bellingham Bay Demonstration Pilot and the Bellingham Bay Comprehensive Strategy

The cleanup of contaminated sediments has proven to be a difficult task, complicated by high costs, limited options for sediment management, concerns about environmental liability, source control issues, habitat alterations, and regulatory and land use considerations. To address the need for sediment cleanup and overcome some of the existing roadblocks to optimizing cleanup actions, the Bellingham Bay Demonstration Pilot (Pilot) was established.

The Pilot brings together a cooperative partnership of agencies and tribes, local government and businesses known collectively as the Pilot Team, to develop an approach for source control, sediment cleanup, and associated habitat restoration in Bellingham Bay. The history of the Pilot has been closely aligned with the MTCA process for the Whatcom Waterway site, though the Pilot scope is more comprehensive than that single site.

As described in Section 2.2.2, the Pilot Team first crafted a Mission Statement for the project. That mission statement is:

> *"To use a new cooperative approach to expedite source control, sediment cleanup and associated habitat restoration in Bellingham Bay."*

The Pilot Team then defined four fundamental project elements – sediment cleanup and source control, sediment disposal siting, habitat, and land use. The Pilot Team then developed seven baywide Pilot goals that reflect the collective interests of the Pilot Team and the desired outcome of the project.

**Seven Baywide Pilot Goals**

> **Goal 1 – Human Health and Safety**: *Implement actions that will enhance the protection of human health.*
>
> **Goal 2 – Ecological Health:** *Implement actions that will protect and improve the ecological health of the bay.*
>
> **Goal 3 – Protect and Restore Ecosystems:** *Implement actions that will protect, restore, or enhance habitat components making up the bay's ecosystem.*
>
> **Goal 4 – Social and Cultural Uses:** *Implement actions that are consistent with or enhance cultural and social uses in the bay and surrounding vicinity.*
>
> **Goal 5 – Resource Management**: *Maximize material re-use in implementing sediment cleanup actions, minimize the use of non-renewable resources, and take advantage of existing infrastructure where possible instead of creating new infrastructure.*
>
> **Goal 6 – Faster, Better, Cheaper:** *Implement actions that are more expedient and more cost-effective, through approaches that achieve multiple objectives.*
>
> **Goal 7 – Economic Vitality:** *Implement actions that enhance water-dependent uses of commercial shoreline property.*

The Pilot Team compiled, collected, and analyzed information for each project element separately. The information and priorities for each of the four project elements were then combined to create the Comprehensive Strategy.

The Comprehensive Strategy was presented in the *Bellingham Bay Comprehensive Strategy Final Environmental Impact Statement*, October, 2000 (2000 FEIS). Section 2.2.3 of this document provides an overview of the elements of the Comprehensive Strategy. The 2000 FEIS included both programmatic elements, as well as project alternatives addressing SEPA review for specific projects:

- **General Baywide Recommendations:** These programmatic elements of the strategy were not tied to specific project alternatives or actions. Together with the Mission Statement and the Goals, these recommendations remain unaffected by land use changes and other actions on Bellingham Bay.
- **Subarea Strategies:** These programmatic strategies provided greater detail on priorities and recommended actions for land use, habitat, sediment cleanup and source control within each of nine geographic sections of the Bay. Some of these strategies have been

affected by the sweeping land use changes that have taken place in the Bay, and Ecology has indicated that these Subarea Strategies will be updated after completion of the community land use planning process.

- **Draft Habitat Mitigation Framework:** This programmatic element was developed by the Pilot Team to address the analysis of habitat impacts and benefits. The Pilot Team also identified priority restoration opportunities within the Bay, many of which have already been implemented.

- **Integrated Near-Term Remedial Action Alternatives:** These project alternatives addressed multiple sediment cleanup sites, including the Whatcom Waterway. This FSEIS updates these project alternatives, to address new site data, area land use changes, and actions taken at other cleanup sites. These changes do not affect the programmatic elements of the Pilot which are addressed by the 2000 FEIS.

Following review and evaluation of public comments on the Draft EIS (published in August 1999), the Comprehensive Strategy was identified as the Preferred Alternative in the 2000 FEIS.

## 1.3 Role of the Current FSEIS

This FSEIS evaluates environmental impacts associated with a specific project, the cleanup of the Whatcom Waterway site.

### 1.3.1 Proposed Action and FSEIS Regulatory Role

The purpose of this FSEIS is to evaluate environmental impacts, benefits and potential mitigation actions associated with the cleanup of the Whatcom Waterway site. The methodology of the environmental review is conducted consistent with SEPA regulatory requirements.

In addition, this FSEIS analysis document reviews the consistency of the proposed action with the goals of the Pilot, as documented in the 2000 Comprehensive Strategy.

### 1.3.2 Relationship to Previous EIS Documents

As described above, the 2000 FEIS included both programmatic and project elements. The programmatic elements of the FEIS remain unchanged, and are carried forward in this document.

The subarea strategies documented in the 2000 FEIS may be updated by the Department of Ecology and the Pilot Team after completion of the community land use planning process. This EIS discusses factors which have affected the subarea strategies, but does not propose final amendments to those subarea strategies.

The specific project alternatives evaluated in the 2000 FEIS must be updated in order to address new site data, area land use and navigation changes, and actions taken at other cleanup sites. This FSEIS provides a current comprehensive analysis of project alternatives for cleanup of the Whatcom Waterway site, and represents a FSEIS with respect to the Whatcom Waterway project elements of the 2000 FEIS.

### 1.3.3 SEPA Lead Agency

The Department of Ecology is the SEPA lead agency for this FSEIS. This is consistent with the 2000 FEIS, for which Ecology was the SEPA lead agency.

### 1.3.4 Relationship to Land Use Planning Process

Community land use planning efforts are ongoing with respect to the future waterfront land uses, infrastructure, and associated land use regulations. Significant planning activities have already been completed. Upcoming activities associated with this process include development of a final area Master Plan for the "New Whatcom" area of Bellingham's Waterfront. That area extends along the waterfront between the Cornwall Avenue Landfill and the I&J Waterway (see Figure 1-1). The Master Planning process includes SEPA environmental review of the Master Plan elements. An EIS is currently being prepared for the Master Planning effort. The current FSEIS does not address the activities of the Master Plan, but remains focused on those activities directly associated with the cleanup of the Whatcom Waterway site.

### 1.3.5 Future Environmental Reviews and Permitting

This is not the only environmental review that will be conducted for the Whatcom Waterway site cleanup. Cleanup of the Whatcom Waterway site will involve future environmental review and permitting activities.

Federal permitting for in-water construction can be implemented either under a Federal 404 Individual permit, or under a Nationwide 38 permit. The federal permitting process includes review of issues relating to wetlands, tribal treaty rights, threatened and endangered species, habitat impacts, and other factors. It is anticipated that the cleanup of the Whatcom Waterway site will be performed using a Federal 404 Individual permit. Where appropriate, that permit will include related actions (e.g., updates to shoreline infrastructure, habitat enhancement projects). This permitting will be conducted concurrently with other approvals associated with in-water construction activities. National Environmental Policy Act (NEPA) review will be completed at the time of project permitting, with the completion of an environmental review by the Corps of Engineers.

In addition, the cleanup may require a Water Quality Certification and a National Pollutant Discharge Elimination Permit from the Department of Ecology, as well as a Washington State Scientific Collection Permit from the Department of Fish and Wildlife.

Lastly, under the MTCA cleanup actions are exempt from the procedural requirements of the following state and local permits however the substantive requirements must be followed:

- Hydraulic Project Approval (Washington Department of Fish and Wildlife)
- Shoreline Substantial Development (City of Bellingham).

# 1.4 Significant Areas of Controversy and Uncertainty

The primary areas of controversy and uncertainty are as follows:

- The relationship between site cleanup activities required under Model Toxics Control Act (MTCA) and Sediment Management Standards (SMS) regulations, and planned land and navigation uses in waterfront areas
- What mitigation measures may be required to address adverse environmental impacts associated with the RI/FS cleanup alternatives
- Willingness of the parties implementing cleanup to incorporate habitat restoration projects consistent with the Bellingham Bay Comprehensive Strategy.

# 1.5 SEPA Evaluation of Project Alternatives

The primary function of this FSEIS is to document the environmental impacts of each of the project alternatives, consistent with the requirements of SEPA regulations. Review of potential SEPA impacts of site cleanup is also required under SMS regulations. Where the project alternatives as described in the FS Report have significant adverse impacts that can be mitigated, appropriate mitigation measures are defined in the FSEIS. Where project alternatives result in net adverse impacts that are integral to the alternatives and cannot be mitigated, these are identified and discussed.

Based on the SEPA analysis as summarized in Section 4, most of the project alternatives will require mitigation measures over-and-above the elements of the MTCA remedy design concepts. Mitigation measures defined in the SEPA analysis should be considered as part of cleanup planning and implementation. Incremental costs of mitigation will affect the overall cost of each alternative.

Alternatives 5 and 6 had net beneficial impacts or mitigated impacts under the SEPA criteria, indicating that required mitigation measures will be minimal for implementation of these alternatives.

### 1.5.1 Elements of the Environment

The SEPA regulations (WAC 197-11-444) define different elements of the environment that should be considered in the development of an EIS. Following EIS scoping, the Comprehensive Strategy 1999 draft and 2000 final EIS documents organized these SEPA environmental elements into five categories. These five categories were used in analysis of remedial alternatives as part of this FSEIS. The five elements of the environment included the following:

- **Geology, Water, Environmental Health:** These factors include both the natural and built environment. The geology element includes soil and sediment stability issues. The water element focuses on water quality. The environmental health element incorporates both the pollution control benefits of conducting the cleanup, as well as potential impacts/benefits associated with implementation of the cleanup itself.

- **Fish and Wildlife:** This category includes the fish and wildlife in the project area, the different existing habitats, and the potential changes (positive and negative) to those habitats that may occur as part of the cleanup.

- **Land Use, Navigation, and Public Shoreline Access:** This category includes the uses of the project area, including the aquatic areas and nearby shorelines and waterfront properties. The elements within this category focus on existing community priorities that have been defined in previous and ongoing land use planning efforts, and how these priorities are either furthered or adversely impacted by the cleanup alternatives.

- **Air and Noise:** These elements address potential impacts to existing air quality and noise levels, particularly during the construction of the cleanup.

- **Cultural Resources:** Cultural resources include existing archaeological, cultural, and historical resources that may be impacted by the proposed project.

### 1.5.2 SEPA Evaluation of Alternatives

Table 1-1 summarizes the findings of the SEPA evaluation for each of the eight RI/FS alternatives and for the SEPA No Action Alternative. For each element of the environment, the conclusions are summarized based on the level of net impacts to the environment, and whether any adverse impacts are mitigated within the scope of the alternative as defined in the FS Report. Where additional measures may be required above-and-beyond the remedial alternative, such mitigation measures are discussed.

Figures 1-2 and 1-3 illustrate significant differences between several of the project alternatives. Those figures show elements of the remedial alternatives, overlain on the New Whatcom Draft Framework Plan (Appendix E) developed as part of the area land use planning process. Significant SEPA findings for the project alternatives are as follows:

- **No Action Alternative:** The No Action Alternative does not conduct sediment cleanup consistent with MTCA requirements. Adverse impacts are incurred for environmental health as a result. Mitigation of these impacts requires implementation of cleanup actions as in the other project alternatives. The No Action Alternative does not stabilize project shorelines. Because residual impacted sediments are left adjacent to unstabilized project shorelines under this alternative, net adverse impacts were noted under the first SEPA category (geology, water, environmental health). Net adverse impacts were noted under the fish and wildlife category, because while the No Action Alternative retains existing nearshore aquatic habitat within the Inner Whatcom Waterway, these habitat benefits are offset by the lack of environmental protectiveness of the alternative. Additional cleanup measures would be required to mitigate these adverse impacts. Under the third SEPA category (land use, navigation, and shoreline public access) the No Action Alternative was found to have net adverse impacts. The No Action Alternative does not address land use or navigation needs within the Whatcom Waterway channel, leaving residual contaminated sediments at locations and elevations that conflict with planned waterway uses. Further, the No Action Alternative does not support planned aquatic reuse of the ASB, and conflicts with land use plans for this area. Mitigation of land use impacts would require additional environmental cleanup measures, as included in other project alternatives. Because the No Action Alternative will not involve construction activities, there are no anticipated impacts to air or noise levels (SEPA category 4). The No Action Alternative does not involve dredging within the Whatcom Waterway, minimizing the risk of disturbance of historical or cultural artifacts, resulting in no anticipated impacts under SEPA category 5 (historic and cultural preservation).

- **Alternative 1:** Alternative 1 accomplishes sediment cleanup consistent with MTCA requirements. However, the cleanup actions do not stabilize project shorelines. Because residual impacted sediments are left adjacent to unstabilized project shorelines under this alternative, net adverse impacts were noted under the first

SEPA category (geology, water, environmental health). Net beneficial impacts were noted under the fish and wildlife category, because Alternative 1 retains existing nearshore aquatic habitat within the Inner Whatcom Waterway, and creates a new area of improved shallow-water habitat offshore of the ASB. Under the third SEPA category (land use, navigation & shoreline public access) Alternative 1 was found to have net adverse impacts. Alternative 1 does not address land use or navigation needs within the Whatcom Waterway channel, leaving residual contaminated sediments at locations and elevations that conflict with planned waterway uses. Further, Alternative 1 does not achieve restoration of aquatic uses within the ASB, and conflicts with land use plans for this area. Like all of the remediation alternatives, cleanup implementation will result in some impacts under SEPA category 4 (air and noise impacts), though these can be mitigated through compliance with applicable regulatory requirements and best practices. Alternative 1 does not involve dredge within the Whatcom Waterway, minimizing the risk of disturbance of historical or cultural artifacts.

- **Alternative 2:** Alternative 2 is expected to comply with MTCA cleanup requirements, protecting water quality and environmental health. However, the alternative requires deep dredging within the Inner Waterway area, which will destabilize project shorelines. This shoreline destabilization represents a net adverse impact under SEPA category 1 (geology, water, environmental health) that will require mitigation. Mitigation will include the construction of bulkheads and hardened shoreline infrastructure to prevent shoreline collapse and permit use and maintenance of target dredge depths. Probable costs for the construction of this deep draft infrastructure are estimated at $30 million, not including long-term maintenance. Alternative mitigation strategies could include backfilling of the channel after temporary bulkheading and dredging, though this would prevent future deep-draft uses and would also be very costly. Alternative 2 was found to have net beneficial impacts under SEPA category 2 (fish & wildlife), through anticipated net gains in the quantity of shallow-water, nearshore habitat. Sediments removed from the Whatcom Waterway by dredging would be managed using a new containment facility constructed near the Cornwall Avenue Landfill. The design and operation of the facility would be generally consistent with that defined in the 2000 Pilot FEIS. The containment facility is assumed under this alternative to be constructed so that the top layer of the facility remained submerged, with an elevation suitable for development of premium shallow-water habitat. As described in Section 3.3, premium nearshore habitat has the combination of elevation, location, substrate, and other factors that optimize the refuge and forage benefits of the habitat to juvenile salmonids. This habitat created under Alternative 2 would offset losses of existing nearshore aquatic habitat in the Inner Waterway associated with deep dredging of the 1960s federal channel. Under SEPA category 3 (land use, navigation, and shoreline public access) Alternative 2 is expected to result in significant net adverse impacts. The deep dredging and associated shoreline infrastructure requirements of this alternative are inconsistent with planned mixed-use redevelopment of the Inner Waterway. The bulkheads and other infrastructure is in direct conflict with planned habitat enhancements in this area, and the construction of deep draft infrastructure will be in conflict with area redevelopment planning (Figure 1-3). The use restrictions associated with the obsolete federal channel also conflict with local plans for public shoreline access and environmental enhancements in the Inner Waterway areas. These impacts could potentially be mitigated by backfilling the Inner Waterway area after temporary bulkheading and dredging. The capping in-place of the ASB sludges is in direct conflict with planned aquatic reuse of this area. The land use and navigation impacts of Alternative 2 cannot be mitigated, but are intrinsic to this alternative. Like all of the remediation alternatives, cleanup implementation will result in some adverse impacts under SEPA category 4 (air and noise impacts), though these can be mitigated through compliance with applicable regulatory requirements and best practices. Alternative 2 will involve dredging at the head of Whatcom Waterway, raising a potential for disturbance of historical or cultural resources (SEPA category 5). These impacts would need to be mitigated through appropriate planning, archaeological monitoring, and/or other measures.

- **Alternative 3:** Alternative 3 is expected to comply with MTCA cleanup requirements, protecting water quality and environmental health. However, the alternative requires deep dredging within the Inner Waterway area, which will destabilize project shorelines. This shoreline destabilization represents a net adverse impact under SEPA category 1 (geology, water, environmental health) that will require mitigation. Mitigation will include the construction of bulkheads and hardened shoreline infrastructure to prevent shoreline collapse and permit use and maintenance of target dredge depths (Figure 1-3). Probable costs for the construction of this deep draft infrastructure are estimated at $30 million, not including long-term maintenance. Alternative mitigation strategies could include backfilling of the channel after temporary bulkheading and dredging, though this would prevent future deep-draft uses and would also be very costly. Alternative 3 is likely to produce net adverse impacts under SEPA category 2 (fish and wildlife), through anticipated net loss in the quantity of shallow-water, nearshore habitat. Sediments removed from the Whatcom Waterway by dredging would be managed by construction a nearshore fill within the ASB, without creation of new nearshore habitat as in Alternative 2. Some nearshore habitat is constructed offshore of the ASB, but this habitat enhancement may not be sufficient to offset losses of existing nearshore aquatic habitat in the Inner Waterway associated with deep dredging of the 1960s federal channel. These impacts could potentially be mitigated by backfilling the Inner Waterway area after temporary bulkheading and dredging. Otherwise, additional habitat mitigation is likely to be required. Under SEPA category 3 (land use, navigation & shoreline public access) Alternative 3 is expected to result in significant net adverse impacts. The deep dredging and associated shoreline infrastructure requirements of this alternative are inconsistent with planned mixed-use redevelopment of the Inner Waterway. The bulkheads and other infrastructure is in direct conflict with planned habitat enhancements in this area, and the construction of deep draft infrastructure will be in conflict with area redevelopment planning. The use restrictions associated with the obsolete federal channel also conflict with local plans for public shoreline access and environmental enhancements in the Inner Waterway areas. These impacts could potentially be mitigated by backfilling the Inner Waterway area after temporary bulkheading and dredging. The construction of the nearshore fill within the ASB is in direct conflict with planned aquatic reuse of this area. The land use and navigation impacts of Alternative 3 cannot be mitigated, but are intrinsic to this alternative. Like all of the remediation alternatives, cleanup implementation will result in some adverse impacts under SEPA category 4 (air and noise impacts), though these can be mitigated through compliance with applicable regulatory requirements and best practices. Alternative 3 will involve dredging at the head of Whatcom Waterway, raising a potential for disturbance of historical or cultural resources (SEPA category 5). These impacts would need to be mitigated through appropriate planning, archaeological monitoring, and/or other measures.

- **Alternative 4:** Alternative 4 is expected to comply with MTCA cleanup requirements, protecting water quality and environmental health. Unlike previous alternatives 1, 2 and 3, Alternative 4 conducts remediation of the Inner Waterway area consistent with the multi-purpose waterway concept (Figure 1-2). Capping and stabilization of Inner Waterway shorelines will be accomplished as part of the implementation of this alternative, in a manner consistent with planned land and navigation uses in this area. Alternative 4 therefore achieves net beneficial impacts under

SEPA category 1 (geology, water, environmental health). There are some habitat impacts under Alternative 4, but these are offset by habitat gains through preservation and construction of nearshore habitat (Figure 1-2). Alternative 4 produces a net beneficial impact under SEPA category 2 (fish and wildlife). Under SEPA category 3 (land use, navigation, and shoreline public access), this alternative results in net adverse impacts that cannot be mitigated. The alternative avoids the deep dredging and associated shoreline infrastructure requirements of Alternatives 2 and 3, and hence avoids navigation and land use conflicts in the Inner Whatcom Waterway. However, the capping of the ASB sludges results in direct conflicts with planned aquatic reuse of this area. The land use and navigation impacts of Alternative 4 cannot be mitigated, and are intrinsic to this alternative. Like all of the remediation alternatives, cleanup implementation will result in some adverse impacts under SEPA category 4 (air and noise impacts), though these can be mitigated through compliance with applicable regulatory requirements and best practices. Alternative 4 will involve dredging in the Whatcom Waterway, but dredging at the head of Whatcom Waterway is minimized, increasing protection for potential historical or cultural resources. Potential impacts under SEPA category 5 can be mitigated through appropriate project design and archeological review.

- **Alternative 5:** Alternative 5 is expected to comply with MTCA cleanup requirements, protecting water quality and environmental health. Like Alternative 4, this alternative conducts remediation of the Inner Waterway area consistent with the multi-purpose waterway concept. Dredging, capping and stabilization of Inner Waterway shorelines will be accomplished as part of the implementation of this alternative, in a manner consistent with planned land and navigation uses in this area. Alternative 5 therefore achieves net beneficial impacts under SEPA category 1 (geology, water, environmental health). There are some habitat impacts under Alternative 5, but these are offset by a substantial net gain in the quantity of nearshore habitat. In addition to the habitat improvements included in Alternative 4, Alternative 5 accomplishes remediation of the ASB, and the ASB is reconnected to the surface waters of Bellingham Bay (Figure 1-2). This increases open-water habitat by approximately 28 acres, and introduces nearly 4,500 linear feet of salmonid migration corridor in an area formerly cut off from Bellingham Bay. Alternative 5 produces a substantial net beneficial impact under SEPA category 2 (fish and wildlife). Under SEPA category 3 (land use, navigation, and shoreline public access), this alternative results in significant net beneficial impacts. The alternative accomplishes implementation of the multi-purpose channel concept, including deep dredging at the Bellingham Shipping Terminal, and dredging, capping and shoreline stabilization in the Inner Waterway. Shorelines in this area are reconstructed in a manner consistent with planned mixed use redevelopment of the Inner Waterway (Figure 1-2). Remediation of the ASB facilitates planned aquatic reuse of this area for construction of a marina with integrated public access and habitat enhancements. Like all of the remediation alternatives, cleanup implementation will result in some adverse impacts under SEPA category 4 (air and noise impacts), though these can be mitigated through compliance with applicable regulatory requirements and best practices. Alternative 5 will involve dredging in the Whatcom Waterway, but dredging at the head of Whatcom Waterway is minimized, increasing protection for potential historical or cultural resources. Potential impacts under SEPA category 5 can be mitigated through appropriate project design and archeological review.

- **Alternative 6:** Most elements of Alternative 6 are identical to those of Alternative 5. Alternative 6 results in net beneficial impacts under the first three of the SEPA categories, and results in mitigated impacts under the fourth and fifth category. The main difference between Alternative 6 and Alternative 5 is the increased use of dredging near the Bellingham Shipping Terminal. This increased dredging is compatible with planned navigation and land uses, and does not result in requirements for new shoreline infrastructure. The deeper dredging does not trigger new habitat impacts, because the dredging is confined to deep-water areas. As a result, the additional dredging does not result in new adverse impacts under SEPA categories. In fact, the additional dredging provides additional benefits under the third SEPA category (land use, navigation, and shoreline public access) by supporting potential future deepening of the Outer Whatcom Waterway, should that be required in the future.

- **Alternative 7:** Alternative 7 is expected to comply with MTCA cleanup requirements, protecting water quality and environmental health. However, the alternative requires deep dredging within the Inner Waterway area, which will destabilize project shorelines. This shoreline destabilization represents a net adverse impact under SEPA category 1 (geology, water, environmental health) that will require mitigation. Mitigation will include the construction of bulkheads and hardened shoreline infrastructure to prevent shoreline collapse and permit use and maintenance of target dredge depths. Probable costs for the construction of this deep draft infrastructure are estimated at $30 million, not including long-term maintenance. Alternative mitigation strategies could include backfilling of the channel after temporary bulkheading and dredging, though this would prevent future deep-draft uses and would also be very costly. Alternative 7 is likely to produce mitigated adverse impacts under SEPA category 2 (fish & wildlife), through anticipated impacts to existing shallow-water, nearshore habitat. As with Alternatives 5 and 6, nearshore habitat improvements are accomplished as part of the remediation of the ASB, and construction of a sediment cap and habitat bench offshore of the ASB. This additional habitat is expected to offset the destruction of nearshore habitat at the head and along the sides of the Whatcom Waterway. Additional habitat mitigation is not likely to be required under Alternative 7. Under SEPA category 3 (land use, navigation & shoreline public access) Alternative 7 is expected to result in significant net adverse impacts. The deep dredging and associated shoreline infrastructure requirements of this alternative are inconsistent with planned mixed-use redevelopment of the Inner Waterway. The bulkheads and other infrastructure are in direct conflict with planned habitat enhancements in this area, and the construction of deep draft infrastructure will be in conflict with area redevelopment planning. The use restrictions associated with the obsolete federal channel also conflict with local plans for public shoreline access and environmental enhancements in the Inner Waterway areas. These impacts could potentially be mitigated by backfilling the Inner Waterway area after temporary bulkheading and dredging. Like all of the remediation alternatives, cleanup implementation will result in some adverse impacts under SEPA category 4 (air and noise impacts), though these can be mitigated through compliance with applicable regulatory requirements and best practices. Alternative 7 will involve dredging at the head of Whatcom Waterway, raising a potential for disturbance of historical or cultural resources (SEPA category 5). These impacts would need to be mitigated through appropriate planning, archaeological monitoring, and/or other measures.

- **Alternative 8:** Alternative 8 is expected to comply with MTCA cleanup requirements, protecting water quality and environmental health. However, the alternative requires deep dredging within the Inner Waterway area, which will destabilize project shorelines. This shoreline destabilization represents a net adverse impact under SEPA category 1 (geology, water, environmental health) that will require mitigation. Mitigation will include the construction of bulkheads and hardened shoreline infrastructure to prevent shoreline collapse and permit use and maintenance of target dredge depths. Probable costs for the construction of this deep draft infrastructure are estimated at $30 million, not including long-term maintenance. Alternative mitigation strategies could include backfilling of the channel after temporary bulkheading and dredging, though this would prevent future deep-draft uses and would also be very costly. Alternative 8 is likely to produce net adverse impacts under SEPA category 2 (fish & wildlife), through anticipated impacts to existing shallow-water, nearshore habitat. As with Alternatives 5 and 6, nearshore habitat improvements are accomplished as part of the remediation of the ASB. However, Alternative 8 converts nearshore habitat to deep-water habitat in areas offshore and adjacent to the ASB. These conversions represent net adverse impacts to juvenile salmonid habitat. In addition to the destruction of nearshore habitat at the head and along the sides of the Whatcom Waterway, Alternative 8 is likely to result in net adverse impacts to fish and wildlife. Additional habitat mitigation is likely to be required under Alternative 8. Inner Waterway habitat impacts could potentially be mitigated by backfilling the Inner Waterway area after temporary bulkheading and dredging. Under SEPA category 3 (land use, navigation & shoreline public access) Alternative 8 is expected to result in significant net adverse impacts. The deep dredging and associated shoreline infrastructure requirements of this alternative are inconsistent with planned mixed-use redevelopment of the Inner Waterway. The bulkheads and other infrastructure is in direct conflict with planned habitat enhancements in this area, and the construction of deep draft infrastructure will be in conflict with area redevelopment planning. The use restrictions associated with the obsolete federal channel also conflict with local plans for public shoreline access and environmental enhancements in the Inner Waterway areas. These impacts could potentially be mitigated by backfilling the Inner Waterway area after temporary bulkheading and dredging. Of the evaluated remediation alternatives, implementation of Alternative 8 will result in the greatest adverse impacts under SEPA category 4 (air and noise impacts), though these can be mitigated through compliance with applicable regulatory requirements and best practices. Alternative 8 will involve dredging at the head of Whatcom Waterway, raising a potential for disturbance of historical or cultural resources (SEPA category 5). These impacts would need to be mitigated through appropriate planning, archaeological monitoring, and/or other measures.

# 1.6 Pilot Evaluation of Alternatives

The Pilot analysis of alternatives summarized in Section 5 of this FSEIS is different from MTCA or SEPA in that it is not required under existing regulatory authorities. Consistency with the Pilot Comprehensive Strategy and the seven Pilot Goals is voluntary. However, the use of the Pilot goals provides an additional basis by which the qualitative benefits or short-comings of a remedial alternative can be measured.

As shown in Table 1-1, each of the alternatives was qualitatively ranked in Section 5 under each of the seven Pilot Goals based on the ability of the alternative to further that goal. Qualitative rankings were applied as either "Low," "Medium," or "High." A "high" ranking indicates that the alternative provides better progress toward that Pilot goal than other alternatives ranked as "Low," or "Medium." Composite rankings were then applied based on the average results of the seven individual rankings for each alternative.

Based on the Pilot evaluation as documented in Table 1-1, the two alternatives that provide the greatest overall benefits are Alternatives 5 and 6. These two alternatives are roughly equivalent to each other, and both are consistent with the land use planning objectives identified in the New Whatcom Draft Framework Plan, as illustrated in Figure 1-2. Significant findings from the Pilot evaluation for these and the other alternatives are as follows:

- **No Action Alternative:** The Pilot evaluation resulted in very low rankings for the No Action Alternative. That alternative received low rankings under all seven of the individual Pilot Goals. The Pilot analysis suggests that even in the absence of MTCA and SMS requirements (which prevent use of the No Action Alternative at the site), further consideration of the No Action Alternative is not warranted.

- **Alternative 1:** A low Pilot ranking was also identified for Alternative 1. This alternative represents the lowest cost alternative evaluated in the Feasibility Study. Alternative 1 received medium rankings for Goals 1, 2 and 3 (Human Health & Safety, Ecological Health and Habitat Protection & Restoration). However, these modest benefits were offset by low rankings for other Pilot Goals 4 through 7 (Social & Cultural Uses; Resource Management; Faster, Better, Cheaper; and Economic Vitality, Shoreline Land Use).

- **Alternatives 2, 3 & 4:** Alternatives 2, 3 and 4 all ranked medium under the Pilot. These alternatives all ranked medium for Goals 1 and 2 (Human Health & Safety and for Ecological Health). The alternatives all received medium rankings for Goals 5 and 6 (Resource Management and Faster, Better, Cheaper), reflecting the cost-effectiveness of these alternatives relative to some other project alternatives. Alternatives 2 and 3 ranked low for Goals 4 and 7 (Social & Cultural Uses and Economic Vitality & Shoreline Land Use), because these alternatives conflict with planned land uses both within the Inner Waterway and also within the ASB. The greatest differences in rankings between Alternatives 2, 3 and 4 were noted with respect to Goal 3 (Habitat Protection & Restoration). Habitat Protection and Restoration Rankings varied from high (Alternative 2) to low (Alternative 3), reflecting the significant differences in net environmental impacts/benefits of these alternatives to fish and wildlife habitat.

- **Alternatives 5 & 6:** Alternatives 5 and 6 received the highest rankings against Pilot goals. These alternatives received high rankings under each of the seven Pilot Goals. High rankings under Goals 1 and 2 (Human Health & Safety and Ecological Health) were achieved because cleanup is conducted to the maximum extent practicable as defined under MTCA (see discussion Section 5.3). High rankings under Goal 3 (Habitat Protection and Restoration) were achieved, because these Alternatives provide the greatest restoration benefits of any of the project alternatives. The remedies are specifically tailored to planned waterfront land uses, resulting in high rankings for Goals 4 and 7 (Social & Cultural Uses and Economic Vitality & Shoreline Land Uses). High rankings under goals 5 and 6 (Resource Use and Faster, Better Cheaper) apply to Alternatives 5 and 6. While the probable costs of the remedial alternatives are higher than Alternatives 1-4, these costs are proportionate to environmental, habitat and land use benefits achieved under Alternatives 5 and 6. Furthermore, some of the incremental mitigation costs and resource requirements incurred for Alternatives 2 and 3 are avoided. Finally, Alternatives 5 and 6 provide an opportunity to capture additional funding sources (i.e., moorage revenues) to help offset the costs of remediation.

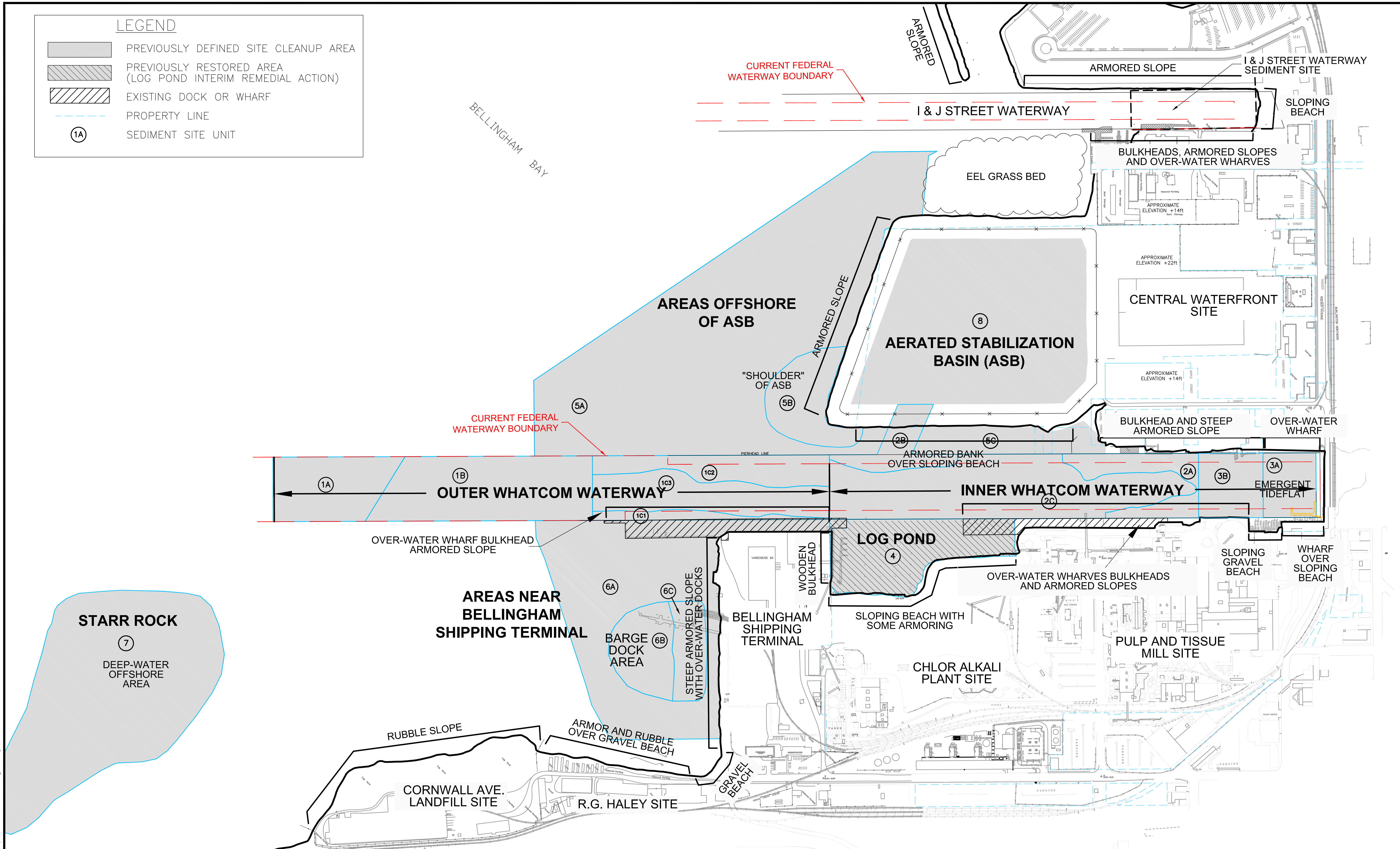
- **Alternatives 7 & 8:** Alternatives 7 and 8 were the two highest cost alternatives evaluated in the Feasibility Study. Alternative 7 was ranked medium against the Pilot Goals, and Alternative 8 was ranked low. Both of these alternatives ranked high for Goals 1 and 2 (Human Health and Safety and Ecological Health), because they conduct cleanup to at least the level considered permanent to the maximum extent practicable under MTCA, as with Alternatives 5 and 6. However, Alternative 7 received only medium rankings for Goal 3 (Habitat Protection and Restoration). Alternative 7 is considered to roughly balance habitat impacts and benefits. Alternative 8 receives a low ranking under Goal 3, because Alternative 8 appears to produce a net loss of premium nearshore habitat. The two alternatives ranked low for Goals 4 and 7 (Social & Cultural Uses and Economic Vitality, Shoreline Land Use) due to the conflicts between the cleanup alternatives and the planned navigation and land uses. Alternatives 7 and 8 received low rankings for Goals 5 and 6 (Resource Management and Faster, Better, Cheaper) because of the disproportionately high costs of the alternatives relative to the environmental, land use and habitat benefits of the alternatives.

## Table 1-1. Summary of EIS Alternatives Analysis

| **Alternative Number**<br>Probable Cost ($Million) | **No Action**<br>$0 | **Alt. 1**<br>$8 | **Alt. 2**<br>$34 | **Alt. 3**<br>$34 | **Alt. 4**<br>$21 | **Alt. 5**<br>$42 | **Alt. 6**<br>$44 | **Alt. 7**<br>$74 | **Alt. 8**<br>$146 |
|---|---|---|---|---|---|---|---|---|---|
| **Alternative Description (Section 4)** | Fig 4-1 | Fig 4-2 | Fig 4-3 | Fig 4-4 | Fig 4-5 | Fig 4-6 | Fig 4-7 | Fig 4-8 | Fig 4-9 |
| Waterway Remedy | | | | | | | | | |
| Waterway Uses | Limited-Use | Limited-Use | Industrial | Industrial | Multi-Purpose | Multi-Purpose | Multi-Purpose | Industrial | Industrial |
| Sediment Disposal | None | None | Cornwall CAD | ASB Fill | Upland | Upland | Upland | Upland | Upland |
| ASB Area Remedy | | | | | | | | | |
| Future Uses | Non-Aquatic Use | Non-Aquatic Use | Non-Aquatic Use | Non-Aquatic Use | Non-Aquatic Use | Aquatic Reuse | Aquatic Reuse | Aquatic Reuse | Aquatic Reuse |
| Sediment Disposal | None | None | None | ASB Fill | None | Upland | Upland | Upland | Upland |
| **SEPA Analysis of Impacts, Benefits & Mitigation (Section 4)** | | | | | | | | | |
| **Elements of the Environment (see Table 4-2 for detailed analysis)** *(WAC 197-11-444)* [1] | | | | | | | | | |
| 1 Geology, Water, Environmental Health | Net Adverse Impacts | Net Adverse Impacts | Net Adverse Impacts | Net Adverse Impacts | Net Beneficial Impacts | Net Beneficial Impacts | Net Beneficial Impacts | Net Adverse Impacts | Net Adverse Impacts |
| 2 Fish & Wildlife | Net Adverse Impacts | Net Beneficial Impacts | Net Beneficial Impacts | Net Adverse Impacts | Net Beneficial Impacts | Net Beneficial Impacts | Net Beneficial Impacts | Mitigated Impacts | Net Adverse Impacts |
| 3 Land Use, Navigation & Shoreline Public Access | Net Adverse Impacts | Net Adverse Impacts | Net Adverse Impacts | Net Adverse Impacts | Net Adverse Impacts | Net Beneficial Impacts | Net Beneficial Impacts | Net Adverse Impacts | Net Adverse Impacts |
| 4 Air & Noise | --<br>No Change | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts |
| 5 Historic & Cultural Preservation | --<br>No Change | --<br>No Change | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts | Mitigated Impacts |
| **Pilot Comparative Analysis of Alternatives (Section 5)** | | | | | | | | | |
| **Overall Ranking of Alternative Against Pilot Goals** *(See Section 5.2, Table 5-1)* | Low | Low | Medium | Medium | Medium | High | High | Medium | Low |
| 1 *Human Health & Safety* | Low | Medium | Medium | Medium | Medium | High | High | High | High |
| 2 *Ecological Health* | Low | Medium | Medium | Medium | Medium | High | High | High | High |
| 3 *Habitat Protection & Restoration* | Low | Medium | High | Low | Medium | High | High | Medium | Low |
| 4 *Social & Cultural Uses* | Low | Low | Low | Low | Medium | High | High | Low | Low |
| 5 *Resource Management* | Low | Low | Medium | Medium | Medium | | High | Low | Low |
| 6 *Faster, Better, Cheaper* | Low | Low | Medium | Medium | Medium | High | High | Low | Very Low |
| 7 *Economic Vitality, Shoreline Land Use* | Low | Low | Low | Low | Medium | High | High | Low | Low |
| **Alternatives Ranking Under MTCA & SMS** *(See Project MTCA RI/FS Report)* | --<br>Not Evaluated<br>(Not MTCA Compliant) | Low | Medium | Medium | Medium | High<br>(RI/FS Preferred Alt.) | High<br>(RI/FS Preferred Alt.) | Low [2] | Low [2] |

**Notes:**

1. Consistent with WAC 197-11-444(3), the SEPA environmental elements have been combined to improve readability and to focus on significant issues. Categorization of the environmental elements was performed consistent with the Comprehensive Strategy 2000 FEIS.
2. Alternatives 7 and 8 were determined to be impracticable based on the MTCA disproportionate cost analysis, resulting in a low overall MTCA alternative ranking.




RETEC

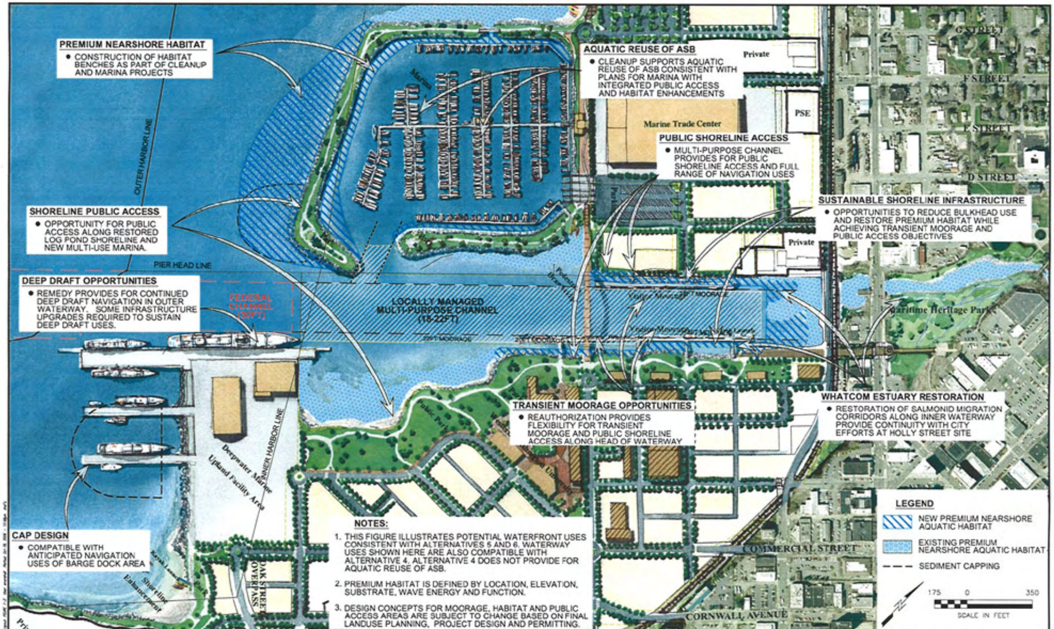
WHATCOM WATERWAY
ENVIRONMENTAL IMPACT STATEMENT
PORTB-18876-240

DATE: 09/29/06 DRWN: E.M./SEA

SITE LOCATION AND SEDIMENT SITE UNITS

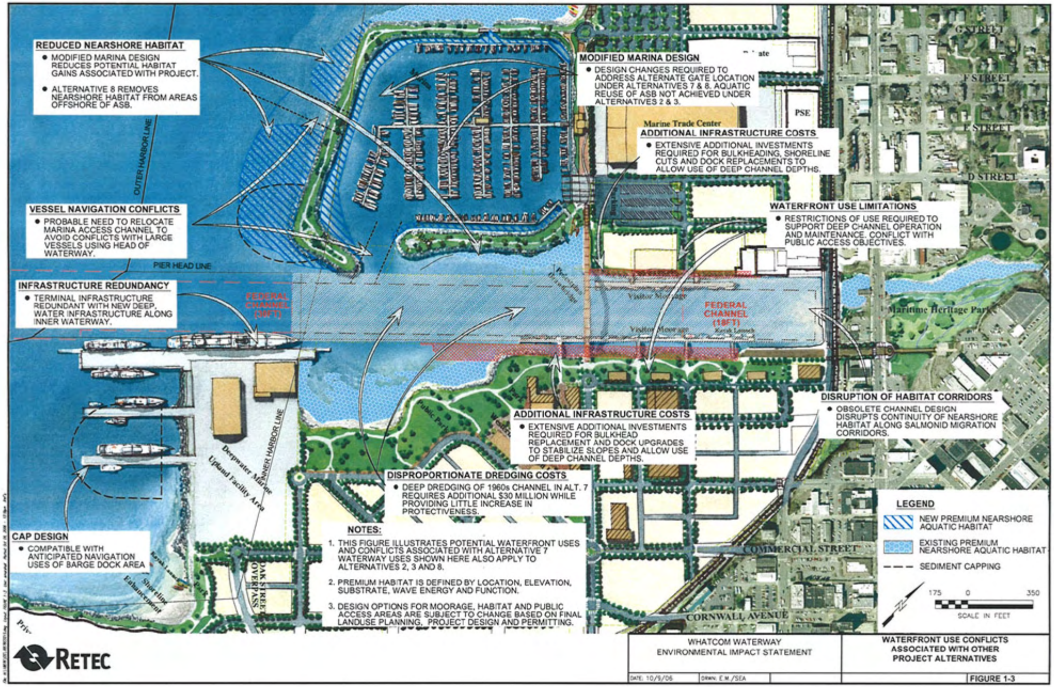
FIGURE 1-1

File: H:\18876\EIS\18876EIS004.dwg Layout: FIGURE 1-1 User: emarshall Plotted: Oct 04, 2006 - 8:35am Xref's:




RETEC

| WHATCOM WATERWAY SUPPLEMENTAL EIS | POTENTIAL INTEGRATION OF WATERFRONT USES WITH WITH FS ALTERNATIVES 5 AND 6 |
|---|---|
| DATE: 10/6/06 DRWN: E.M./SEA | FIGURE 1-2 |



WATERFRONT USE CONFLICTS ASSOCIATED WITH OTHER PROJECT ALTERNATIVES

FIGURE 1-3

# 2 Project Background

This section provides background information regarding the Whatcom Waterway site, the Bellingham Bay Demonstration Pilot, and the context of this FSEIS. This information is provided to assist readers in understanding the purpose and context of this document. Also included in this section is an introduction to sediment cleanup laws and techniques (Section 2.4) that are relevant to the project.

## 2.1 Whatcom Waterway Site History

The Whatcom Waterway Site (“Site”) consists of lands located within and adjacent to the Whatcom Waterway in Bellingham, Washington (Figure 1-1). Mercury and other contaminants have been detected within the Site at concentrations that exceed cleanup standards defined under MTCA and SMS regulations.

### 2.1.1 Site-Area History

The vicinity of the Whatcom Waterway site area has been used for industrial activities by multiple parties since the late 1800s. Industrial operations conducted within the area include, but are not limited to, the following:

- Coal shipping
- Log rafting
- Pulp and paper mill operation
- Chemical manufacturing
- Cargo terminal operations
- Grain shipment
- Fish processing and cannery operations
- Bulk petroleum terminal operations (two facilities)
- Boatyard operation
- Handling of sand, gravel, and other mineral ores
- Municipal landfill operations
- Multiple lumber mills and a wood products manufacturing operations
- Operation of a co-generation power plant.

Pulp and paper mills have been operated on the Pulp and Tissue Mill Site (Figure 1-1). In the early 1900s the mills were operated by Puget Sound Pulp and Timber. The mills were later sold to Georgia Pacific (GP) in the 1960s.

In 1965 GP constructed a chlor-alkali plant adjacent to the Log Pond. The plant operated between 1965 and 1999 using a mercury cell process to produce chlorine, sodium hydroxide, and hydrogen. Between 1965 and 1971, mercury-containing wastewaters from the chlor-alkali plant were discharged directly into the Log Pond. Between 1971 and 1979 pretreatment measures were installed to reduce mercury discharges. Chlor-alkali plant wastewater discharges to the Log Pond area were discontinued in 1979, following construction of the Aerated Stabilization Basin (ASB).

The ASB facility was constructed by GP during 1978 and 1979 for management of wastewaters in compliance with the Clean Water Act. The ASB design was approved by Ecology in 1978, and a Corps permit and City Shoreline Substantial Development Permit were obtained. Permitting included completion of an EIS for the project (Brown and Caldwell, 1978). The outfall from the ASB continues to be owned by GP and wastewater and sediment quality in that area are monitored under the National Pollutant Discharge Elimination System (NPDES) permit program (Permit No. WA-000109-1).

The Whatcom Waterway was listed by Ecology as a contaminated site in the early 1990s. The site RI/FS process was initiated after completion of a site hazard assessment by Ecology, and after development of an Agreed Order between Ecology and GP.

### 2.1.2 The 2000 RI/FS and EIS

In 1996, the RI/FS process for the Whatcom Waterway site was initiated under a MTCA Agreed Order (DE 95TC-N399) between GP and Ecology. Detailed sampling and analysis was performed in 1996 and 1998, and an RI/FS report was completed in July 2000 following public notice and opportunity to comment. Sediment data summaries from the 2000 RI/FS are attached as Appendix B of the FS.

In parallel with the RI/FS activities, a Bellingham Bay Comprehensive Strategy EIS was prepared. The EIS was both a project-specific EIS, evaluating a range of cleanup alternatives for the Whatcom Waterway site, and a programmatic EIS, evaluating the Bellingham Bay Comprehensive Strategy. The Comprehensive Strategy was developed by an interagency consortium known as the Pilot. The Pilot brought together a cooperative partnership of agencies, tribes, local government, and businesses known collectively as the Pilot Work Group, to develop a cooperative approach to expedite source control, sediment cleanup, and associated habitat restoration in Bellingham Bay. As part of the approach, the Pilot Work Group developed a Comprehensive Strategy that considered contaminated sediments, sources of pollution, habitat restoration, and in-water and shoreline land use from a Bay-wide perspective. The strategy integrated this information to identify priority issues requiring action in the near-term and to provide long-term guidance to decision-makers.

The Comprehensive Strategy was finalized as a Final Environmental Impact Statement in October 2000 prepared under SEPA. While it was published as a companion document to the 2000 RI/FS for the Whatcom Waterway site, and while it addressed project impacts associated with the MTCA cleanup of the

Whatcom Waterway site, the 2000 FEIS contained other contemplated actions above-and-beyond the regulatory requirements of the MTCA site cleanup process. For example, the potential habitat restoration actions identified in the Comprehensive Strategy represent additional actions that are not required under state or federal regulations, but which would benefit the ecosystem of Bellingham Bay if implemented. The Pilot Work Group agreed to work cooperatively to identify opportunities to further the goals of the Pilot. The Comprehensive Strategy identified a broad series of potential actions that were considered by the Work Group to be beneficial in furthering the goals of the Pilot throughout Bellingham Bay. These potential actions were organized by subareas within Bellingham Bay, and were published as Appendix A of the 2000 Comprehensive Strategy EIS (a copy of this appendix is also attached to this FSEIS as Appendix A).

Absent significant changes or new information, the 2000 RI/FS and EIS documents would have formed the basis for Ecology's selection of a cleanup approach for the Whatcom Waterway site. That selection would have been formalized in a CAP. However, subsequent events and new information have made it necessary to complete the supplemental RI/FS and EIS studies.

In 2001 GP closed its pulp mill which dramatically reduced the wastewater treatment needs associated with process operations. The ASB was constructed in 1978 within the Whatcom Waterway site area, on lands impacted by mercury discharges from the chlor-alkali plant. In addition, the ASB facility has received effluent from the chlor-alkali plant and the pulp and tissue mills. The ASB contamination from these sources was not addressed in the 2000 Whatcom Waterway RI/FS investigations of remedial alternatives, because at that time it was an operational wastewater treatment facility. However, with the reduced treatment needs resulting from the 2001 closure of the GP pulp mill, the contamination issues could be addressed as part of the cleanup of the Whatcom Waterway site.

To address this new portion of the Whatcom Waterway site, a new remedial alternative was evaluated in 2002 through a Supplemental FS (Anchor, 2002a) and companion Draft Supplemental EIS (Anchor, 2002b). The new remedial alternative proposed using a portion of the ASB as a near shore fill disposal facility for disposal of contaminated materials removed from areas of the Whatcom Waterway site outside the ASB and from other contaminated sediment sites in Bellingham Bay. The proposal included maintenance of a down-sized wastewater treatment facility constructed within the footprint of the existing ASB.

### 2.1.3 Log Pond Interim Action

In late 2000 and early 2001, Georgia Pacific implemented a combined sediment cleanup and habitat restoration action at the Log Pond, part of the Whatcom Waterway site. The work was performed under the terms of a MTCA Interim Action Agreed Order with Ecology and as authorized under

Clean Water Act Permit No. 2000-2-00424 administered by the U.S. Army Corps of Engineers (Corps). The Log Pond project beneficially reused 43,000 cubic yards of clean dredging materials from the Swinomish navigation channel and from the Squalicum Waterway. The materials were used to cap contaminated sediments in the Log Pond, and to improve habitat substrate and elevations for use by aquatic organisms. The habitat restoration component of the project was voluntarily implemented by GP in accordance with the Bellingham Bay Comprehensive Strategy.

Monitoring of the Log Pond Interim Action has been performed in Year 1, Year 2 and Year 5. Results of monitoring have confirmed that the cap is successfully meeting most performance objectives, with the exception of some erosion at the shoreline edges of the cap. Enhancements to the shoreline edges of the Log Pond cap to correct these erosional areas cap have been incorporated into the Feasibility Study. Monitoring results have documented the development of habitat functions within the Log Pond (Anchor, 2001b and 2002c). Recommendations for enhancement of long-term shoreline stability have been developed as part of the 2006 Supplemental Feasibility Study.

### 2.1.4 Supplemental Investigations

During 1999 and 2000, GP closed its chlor-alkali plant, its pulp mill and its chemical plant. The closure of the Georgia Pacific pulp mill dramatically reduced the water treatment needs associated with company operations. Since its construction in 1978, the ASB facility has received effluents from the chlor-alkali plant, pulp and tissue mills and contaminants in ASB sludges include mercury contamination. However, because the ASB had been in operation as a water treatment facility, the ASB facility had not been previously included in the Whatcom Waterway RI/FS investigations or remedial alternatives.

In spring and summer of 2002, following completion of the 2002 Supplemental FS and EIS, additional site data were collected to inform future remedial design activities. The results of these investigations were summarized in a Pre-Remedial Design Evaluation (PRDE) report (attached as Appendix A of the FS). The PRDE data collection included the following major work elements:

- Surface sediment sampling to document natural recovery rates and refine the boundaries of the area of sediment exceeding site cleanup levels
- Subsurface testing of samples located in the Outer Whatcom Waterway area
- Contaminant mobility testing for use in evaluation and design of confined disposal alternatives

- Geotechnical testing, column settling tests and consolidation tests of site sediments for use in dredging, capping, and confined disposal alternatives evaluations.

In 2003 Ecology requested additional data collection to better characterize contamination within the ASB. This work was conducted under Addendum 4 of the RI/FS Work Plan and included testing of chemical and physical properties of the ASB sludges and underlying native sands. This sampling was performed in the summer of 2003. Data collected during that investigation are attached as Appendix C of the FS Report.

During 2004 additional site characterization data were collected at the ASB facility. This work was conducted under Addendum No. 5 of the RI/FS Work Plan. The investigation included testing of the chemical and physical properties of the ASB berm sands, bathymetric surveys of the ASB, and dewatering tests of the ASB sludges. Sampling was performed between July and September of 2004.

### 2.1.5 Purchase of GP Mill Site by Port of Bellingham

After soliciting interest from various potential purchasers, GP ultimately sold its Bellingham mill site to the Port of Bellingham. The property transfer included an extended due diligence period lasting through late 2004. During the due diligence period the Port conducted extensive community outreach, and met with regulatory and resource agencies, and many project stakeholders. The property transfer was finalized in January of 2005. As part of the transfer agreements, the Port agreed to assume leadership of the cleanup of multiple sites, including the Whatcom Waterway site.

Following completion of the property transaction, the Port and Ecology signed an Amendment to the RI/FS Agreed Order and to the Log Pond Agreed Order. The current RI/FS document integrates previous site investigations and studies and provides a comprehensive evaluation of site conditions and cleanup options. The document addresses current and anticipated land uses, and is performed consistent with the Agreed Order and its Amendments. This FSEIS has been prepared consistent with the Programmatic elements of the Pilot Comprehensive Strategy to evaluate environmental impacts associated with the RI/FS remedial alternatives, and to assist in the identification of preferred alternatives for the site.

## 2.2 History of the Bellingham Bay Pilot and Comprehensive Strategy

This section provides additional background information on the history of the Bellingham Bay Demonstration Pilot and the Comprehensive Strategy.

### 2.2.1 Initial Development of the Pilot Concept

In May of 1994 a group of five federal and state agencies in Washington state formed the Cooperative Sediment Management Program (CSMP) to address the need for sediment cleanup and overcome some of the existing roadblocks to expedited action. The agencies included:

- Washington Department of Ecology
- Washington State Department of Natural Resources
- U.S. Environmental Protection Agency, Region 10
- U.S. Army Corps of Engineers
- Puget Sound Water Quality Action Team.

The Washington State Department of Transportation later joined the CSMP signatory agencies. Working collectively, these agencies proposed to help fund a demonstration pilot (the Pilot) to develop sediment cleanup priorities in an urban embayment of Puget Sound by creating a partnership with local governments and businesses. The key goals identified for the Pilot at that time were to control the sources of contamination and expedite cleanup of high priority sediment sites, test various incentives for cleanup, and create new and flexible methods for achieving cleanup. The CSMP agencies also acknowledged that actions for source control, cleanup, habitat, dredging and other activities such as navigation/commerce are interrelated. The agencies agreed that a broader approach is the proper scale for identifying and managing these activities and for translating laws and programs into effective action. Ecology set aside a grant available to local governments under the Model Toxics Control Act (MTCA) to help fund the Pilot. In June 1996, following discussion with interested parties from four urban bays of Puget Sound, Bellingham Bay was selected as the location for the CSMP Demonstration Pilot.

At the same time the CSMP agencies decided to undertake the Demonstration Pilot, they also agreed to evaluate the feasibility of a Multi-User Disposal Site (MUDS) facility as another method to expedite sediment cleanup. A MUDS facility would accept contaminated sediment from multiple users. The Puget Sound Confined Disposal Site Study Draft Programmatic EIS was issued jointly by the Corps of Engineers, Ecology, and DNR in February of 1999.

The Pilot addresses the area of Bellingham Bay within a line drawn from Point Frances to Governors Point, including Portage Bay and Chuckanut Bay. The geographic scope of the Pilot is focused on the urban portion of Bellingham Bay for data summary and development of strategies for source control and sediment cleanup, and the broader bay for evaluation of natural resource issues and opportunities for habitat protection and restoration.

### 2.2.2 The Pilot Team and its Scope of Work

In September 1996, the Bellingham Bay Pilot Team was established. The Pilot Team included the following:

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency
- National Marine Fisheries Service
- Washington Department of Ecology
- Washington State Department of Natural Resources
- Washington State Department of Transportation
- Washington Department of Fish and Wildlife
- Puget Sound Water Quality Action Team
- City of Bellingham
- Whatcom County Health Department
- Lummi Nation
- Nooksack Tribe
- Georgia Pacific West, Inc.

The Port of Bellingham agreed to be co-project manager with Ecology. Using consensus-based decision-making, the Pilot Team established the Mission Statement and the seven "baywide" goals that it wanted to ultimately achieve. That mission statement is:

> *"To use a new cooperative approach to expedite source control, sediment cleanup and associated habitat restoration in Bellingham Bay."*

As part of project goal setting, the Pilot Team defined four fundamental project elements: sediment cleanup and source control, sediment disposal siting, habitat, and land use. The Pilot Team then developed seven baywide Pilot goals that reflect the collective interests of the Pilot Team and the desired outcome of the project. The Pilot goals were formally adopted by the multi-agency work group in 1997, and these goals provide an additional evaluation tool to assess proposed cleanup actions in Bellingham Bay.

**Seven Baywide Pilot Goals**

> **Goal 1 – Human Health and Safety**: *Implement actions that will enhance the protection of human health.*
>
> **Goal 2 – Ecological Health:** *Implement actions that will protect and improve the ecological health of the bay.*

> **Goal 3 – Protect and Restore Ecosystems:** *Implement actions that will protect, restore, or enhance habitat components making up the bay's ecosystem.*
>
> **Goal 4 – Social and Cultural Uses:** *Implement actions that are consistent with or enhance cultural and social uses in the bay and surrounding vicinity.*
>
> **Goal 5 – Resource Management**: *Maximize material re-use in implementing sediment cleanup actions, minimize the use of non-renewable resources, and take advantage of existing infrastructure where possible instead of creating new infrastructure.*
>
> **Goal 6 – Faster, Better, Cheaper:** *Implement actions that are more expedient and more cost-effective, through approaches that achieve multiple objectives.*
>
> **Goal 7 – Economic Vitality:** *Implement actions that enhance water-dependent uses of commercial shoreline property.*

The Pilot Team compiled, collected, and analyzed information for each project element separately. The information and priorities for each of the four project elements were then combined to create the Comprehensive Strategy.

## 2.2.3 Bellingham Bay Comprehensive Strategy

The Bellingham Bay Comprehensive Strategy was presented in a Final EIS in October of 2000. Following review and evaluation of comments on the Draft EIS (published in August 1999), the Comprehensive Strategy was identified as the Preferred Alternative in the October 2000 FEIS.

The Comprehensive Strategy included both programmatic elements, as well as project alternatives addressing SEPA review for specific projects. The programmatic elements of the Comprehensive Strategy included Bay-Wide Recommendations, Sub-Area Strategies, and a Habitat Mitigation Framework. Project elements of the Comprehensive Strategy included SEPA review of specific near-term remedial action alternatives. An overview of these programmatic and project elements of the Comprehensive Strategy is provided below.

### General Baywide Recommendations

The Comprehensive Strategy included a number of Baywide Recommendations for achieving the seven goals of the Pilot. These general recommendations were listed according to the four project elements. These Baywide Recommendations were programmatic in nature and were not tied to specific project alternatives or actions.

Together with the Mission Statement and the Pilot Goals, the General Baywide Recommendations remain unaffected by land use changes and other actions on Bellingham Bay, and they provide a guide to implementation of sediment cleanup, source control, habitat restoration and land use actions within Bellingham Bay.

## Subarea Strategies and Habitat Mitigation Framework

The Comprehensive Strategy also included specific strategy recommendations for each of nine geographic subareas within Bellingham Bay. These Subarea Strategies (Appendix A) provided greater detail on priorities and recommended actions for land use, habitat, sediment cleanup and source control within each geographic subarea.

Some elements of the Subarea Strategies have been affected by the sweeping land use changes that have taken place since development of the Comprehensive Strategy (Section 2.2.4). Ecology has indicated that these Subarea Strategies are to be updated in the near future following completion of community land use planning efforts.

The Pilot Team also developed lists of priority restoration opportunities that were available within Bellingham Bay. This list of restoration opportunities is included in the Subarea Strategies contained in Appendix A of the 2000 FEIS and in Appendix A of this FSEIS. A number of these restoration opportunities have been accomplished since development of the initial list. However, project opportunities remain and can be used to guide project planning and prioritization for habitat restoration activities.

In addition to the Subarea Strategies, a Habitat Mitigation Framework (Appendix D of this FSEIS) was developed by the Pilot Team to address the analysis of habitat impacts and benefits, and to clarify the types of mitigation and incremental habitat enhancement actions that may be implemented within Bellingham Bay.

## Integrated Near-Term Remedial Action Alternatives

As part of the 2000 FEIS, SEPA evaluation was conducted for specific project alternatives that addressed multiple sediment cleanup sites, including the Whatcom Waterway, as well as the Cornwall Avenue Landfill and other sites. For the Whatcom Waterway, it has been necessary to update the project alternatives to address new site data, area land use changes, and actions taken at other cleanup sites. Therefore, this FSEIS has been developed to address these changes. These changes do not affect the programmatic elements of the Pilot which are addressed by the 2000 FEIS.

## 2.2.4 Recent Changes Affecting the Project

Extensive changes have occurred between 2000 and the present that have necessitated updates to both the Whatcom Waterway RI/FS and the EIS evaluation of project alternatives. These changes include the following:

- 1999 closure of the GP chlor-alkali plant.
- 2001 closure of the GP pulp mill and chemical plant.
- 2004 development of the Waterfront Vision and Framework Plan by the Waterfront Futures Group, a community land use visioning effort initiated by the City and the Port and involving Bellingham citizens. The group developed a suite of Guiding Principles and Recommendations that addressed land use priorities for six areas of Bellingham Bay.
- Completion of marina demand studies and marina alternatives siting analyses by the Port, including identification of the ASB as a preferred location for development of a future small boat marina.
- January 2005 Port acquisition of 137 acres of GP waterfront property, including portions of the Whatcom Waterway site, in accordance with the Waterfront Vision and Framework Plan.
- Additional evaluations of navigation and waterfront infrastructure needs by the Port, DNR, and the Army Corps of Engineers relating to the Whatcom Waterway. These evaluations included development of a November 2005 Port-DNR Memorandum of Understanding relating to changing waterfront land use needs (Appendix C), development of a May 2006 Port Resolution #1230 and corresponding federal legislation to make adjustments to the dimensions of the federal channel within the Whatcom Waterway (Appendix E). These changes are intended to support the development of waterfront land use, public access, navigation and habitat restoration improvements consistent with the Waterfront Vision and Framework Plan, while maintaining the viability of the Bellingham Shipping Terminal.
- Initiation of a joint Port-City Master Planning process for the waterfront area in the vicinity of the Whatcom Waterway site. This process is being implemented consistent with Port-City interlocal agreements dated January 2005 and July 2006. The interlocal agreements and the planning actions implemented by those agreements propose to redevelop the area to support mixed residential, commercial, light industrial, institutional, and recreational uses and to support the development of transportation, utilities, public access, parks and open space and marine

infrastructure including a marina, boat launch, transient moorage and associated parking. Consistent with the interlocal agreements, the properties within the New Whatcom planning area have been rezoned to mixed-use zoning, contingent on finalization of an approved Master Plan.

- Pending update to the City Shoreline Master Program (SMP). The SMP is a state-mandated shoreline land use planning effort. The SMP update is expected to embrace and elaborate on the work of the Waterfront Futures Group

These factors resulted in changes to the facts relevant to each of the four elements of the Pilot, including sediment cleanup, disposal siting, land use and habitat restoration. An updated RI/FS document and an update to the EIS were required in order to address these changes and ensure an appropriate evaluation of cleanup alternatives.

## 2.3 Role of the Current FSEIS

This FSEIS evaluates environmental impacts associated with a specific project, the cleanup of the Whatcom Waterway site.

### 2.3.1 Proposed Action and FSEIS Regulatory Role

The purpose of this FSEIS is to evaluate environmental impacts, benefits and potential mitigation actions associated with the cleanup of the Whatcom Waterway site, together with habitat and land use issues directly associated with that project. The methodology of the environmental review is conducted consistent with SEPA regulatory requirements.

In addition, this FSEIS analysis document reviews the consistency of the proposed action with the goals of the Pilot, as documented in the 2000 Comprehensive Strategy. While consistency with the goals of the Pilot is not a regulatory requirement, the goals do provide an important bay-wide context for regulatory decisions.

### 2.3.2 Relationship to Previous EIS Documents

As described above, the 2000 FEIS included both programmatic and project elements. The programmatic elements of the FEIS remain unchanged, and are carried forward in this document.

The Subarea Strategies documented in the 2000 FEIS are to be updated by the Department of Ecology and the Pilot Team after completion of the community land use planning process. This FSEIS discusses factors which have affected the Subarea Strategies, but does not propose final amendments to those Subarea Strategies.

The specific project alternatives evaluated in the 2000 FEIS must be updated in order to address new site data, area land use and navigation changes, and actions taken at other cleanup sites. This FSEIS provides a current comprehensive analysis of project alternatives for cleanup of the Whatcom Waterway site, and represents a Supplemental FEIS with respect to the Whatcom Waterway project elements of the 2000 FEIS.

### 2.3.3 SEPA Lead Agency

The Department of Ecology is the SEPA lead agency for this FSEIS. This is consistent with the 2000 FEIS, for which Ecology was the SEPA lead agency.

### 2.3.4 Relationship to Land Use Planning Processes

Community land use planning efforts are ongoing with respect to the future waterfront land uses, infrastructure, and associated land use regulations. Activities conducted to date have included the following:

- Early land use priority setting conducted by the Waterfront Futures Group, and subsequent formal adoption of the Waterfront Futures Group Vision and Framework Plan (Appendix B) by the City of Bellingham
- Land use studies conducted for the Central Waterfront area
- Master Planning efforts for the Bellingham Shipping terminal and vicinity
- Review of navigation needs and infrastructure requirements for the Whatcom Waterway, including development of the November 2005 Port-DNR Memorandum of Understanding (Appendix C) and Port Resolution 1230 (Appendix F) addressing the updating of the federal navigation channel
- Alternatives evaluations for siting of new marina facilities to meet regional moorage demand
- Outreach activities conducted by the Port of Bellingham as part of the GP due diligence process during 2004, including soliciting of extensive stakeholder and public input on potential waterfront cleanup actions, land use alternatives and navigation priorities for the Whatcom Waterway
- Community land use planning efforts planning and redevelopment of the New Whatcom area leading to rezoning of the area for mixed-use development. Excerpts from the Master Planning process are attached as Appendix E.

- Outreach activities associated with the Port's amendment to its Comprehensive Scheme of Harbor Improvements in 2004 identifying the need for future aquatic use of the ASB area, and completion of a community design charette in 2006 (Figure 3-7) by the Port to solicit community input on the integration of habitat and public access elements with the marina uses

- Extensive additional contributions by community groups, research institutions, and project stakeholders.

Upcoming activities associated with this process include development of a final area Master Plan for the "New Whatcom" area of Bellingham's Waterfront. That area extends along the waterfront between the Cornwall Avenue Landfill and the I&J Waterway (see Figure 1-1). The zoning within the New Whatcom area has been updated to a "mixed use" designation by the City, contingent on final development of the area Master Plan. The Master Planning process will include SEPA environmental review of the Master Plan elements. The current FSEIS does not address the activities of the Master Plan, but remains focused on those activities directly associated with the cleanup of the Whatcom Waterway site.

### 2.3.5 Future Environmental Reviews and Permitting

This FSEIS is not the only vehicle for environmental review of the Whatcom Waterway cleanup action. Cleanup of the Whatcom Waterway site will involve future environmental review and permitting activities.

Federal permitting for in-water construction can be implemented either under a Federal 404 Individual permit, or under a Nationwide 38 permit. The federal permitting process includes review of issues relating to wetlands, tribal treaty rights, threatened and endangered species, habitat impacts, and other factors. It is anticipated that the cleanup of the Whatcom Waterway site will be performed using a Federal 404 Individual permit. Where appropriate, that permit will include related actions (e.g., updates to shoreline infrastructure, habitat enhancement projects). This permitting will be conducted concurrently with other approvals associated with in-water construction activities. National Environmental Policy Act (NEPA) review will be completed at the time of project permitting, with the completion of an environmental review by the Corps of Engineers.

The City is currently updating their state-mandated Shoreline Master Plan (SMP) which regulates and manages uses and activities within 200 feet of the shorelines of the City. Shoreline regulations defer to Ecology for site-specific review of cleanup actions conducted under MTCA, provided that those actions are consistent with the substantive requirements of the Shoreline Master Program. The City and Port are working with the Bellingham community to ensure that the land use vision articulated in the Waterfront

Vision and Framework Plan is reflected in the SMP update. The SMP update is expected to be completed in late 2007.

As part of the Cleanup Action Plan development, a request will be made to the City of Bellingham and the Department of Fish and Wildlife for a written description of their substantive permit requirements for the preliminary selected remedy. Additional information will be included in the Cleanup Action Plan.

# 2.4 Introduction to Sediment Cleanup Laws and Techniques

This section provides an overview of the cleanup laws and techniques that are applicable to the cleanup of the Whatcom Waterway site. These laws and techniques are described in more detail in the RI/FS document. The overview provided in this section includes the following three elements:

- **Sediment Cleanup Laws:** Cleanup of the Whatcom Waterway site is governed primarily by two cleanup laws. These include the Model Toxics Control Act (MTCA) and the Sediment Management Standards (SMS). These laws are discussed in Section 2.4.1 below.

- **Cleanup Levels:** Cleanup levels define the goals for site cleanup and are established under state and federal regulations including MTCA and SMS. The cleanup levels applicable to the cleanup of the Whatcom Waterway site are described below in Section 2.4.2.

- **Sediment Cleanup Techniques:** Sediment cleanup actions involve application of specific cleanup techniques or technologies. The cleanup techniques being considered for the Whatcom Waterway site are described in Section 2.4.3 below.

## 2.4.1 Sediment Cleanup Laws

The main state law that defines how cleanup decisions are to be made is the Model Toxics Control Act (MTCA). When contaminated sediments are involved, the cleanup levels and other procedures are also regulated by the Sediment Management Standards (SMS). MTCA regulations specify criteria for the evaluation and conduct of a cleanup action. SMS regulations dictate the standards for cleanup. Under both laws, a cleanup must protect human health and the environment, meet environmental standards in other laws that apply, and provide for monitoring to confirm compliance with site cleanup levels.

The cleanup solutions that have proven successful at sediment cleanup are those that block pathways that can expose people or environmental receptors to contaminants, and that provide a healthy environment over the long-term.

MTCA regulations place a premium on the use of solutions that are "permanent to the maximum extent practicable," and MTCA regulations define the ways in which different cleanup alternatives are to be compared and ranked.

The implementation of a cleanup action under MTCA and SMS must comply with other state, federal and local laws, regulations and ordnances. The ability for a proposed cleanup action to comply with these requirements is considered as part of the remedy selection process under MTCA.

The key MTCA document for evaluating site cleanup actions is the remedial investigation and feasibility study (RI/FS). In the RI/FS, different potential alternatives for conducting a site cleanup action are defined. The alternatives are then evaluated against MTCA criteria, and one or more preferred alternatives are identified. After reviewing the RI/FS study, and after consideration of public comment, Ecology then selects a cleanup method and documents that selection in a document known as the Cleanup Action Plan. The agency-selected cleanup action is then implemented after completion of project design and permitting.

## 2.4.2 Site Cleanup Levels

The Whatcom Waterway site is defined by contaminated sediment. Cleanup levels applicable to sediments are defined by SMS regulations as described below. Some cleanup alternatives may trigger the applicability of cleanup levels for other media, particularly soil and groundwater.

### Sediment Cleanup Levels

SMS regulations govern the identification and cleanup of contaminated sediment sites and establish two sets of numerical chemical criteria against which surface sediment concentrations are evaluated. The more conservative Sediment Quality Standards (SQS) provide a regulatory goal by identifying surface sediments that have no adverse effects on human health or biological resources. The minimum cleanup level (MCUL) (equivalent to the Cleanup Screening Level or CSL), represents the regulatory level that defines minor adverse effects.

The SQS is Ecology's preferred cleanup standard, though Ecology may approve an alternate cleanup level within the range of the SQS and the MCUL if justified by a weighing of environmental benefits, technical feasibility, and cost. Chemical concentrations or confirmatory biological testing data may define compliance with the SQS and MCUL criteria.

The primary cleanup levels for the Whatcom Waterway site are defined as the SQS, as measured using bioassay testing procedures. Chemical numeric standards may also be used to evaluate SQS, but bioassays are given preference under SMS regulations because they are considered a more direct and representative measure of potential biological effects. The bioassay test methods that may be used to evaluate compliance with the SQS are defined in current Ecology regulations and guidance and include tests using the amphipod, larval or juvenile polychaete tests.

Based on the series of sediment investigations performed for surface and subsurface sediments in 1996, 1998, and 2002, the key constituents of concern for the sediments in the Whatcom Waterway site areas include mercury and phenolic compounds. The chemical SQS for mercury is 0.41 mg/kg. The chemical MCUL for mercury is 0.59 mg/kg. These levels apply to total mercury, which is the parameter measured directly in the RI chemical testing program. The main phenolic compound detected at elevated concentrations at the site was 4-methylphenol. The SQS and MCUL values for 4-methylphenol are both 0.67 mg/kg. The phenolic compounds phenol and 2,4-dimethylphenol were noted sporadically in surface sediments. The SQS and MCUL values for 2,4-dimethylphenol are both 0.029 mg/kg.

In addition to the evaluation of benthic effects and compliance with the SQS, cleanup levels at the site must protect against other adverse effects to human health and the environment, including food chain effects associated with the potential bioaccumulation of mercury. As described in the RI Report, a site-specific BSL of 1.2 mg/kg mercury was developed as part of the 2000 RI/FS. This BSL provides an area-wide average concentration of mercury in sediments that is protective of subsistence-level human consumption of seafood from Bellingham Bay. Bioaccumulation testing performed as part of the RI/FS and related studies has demonstrated that sediment mercury concentrations below this value do not present a risk of food chain effects to ecological receptors. Ecology has conservatively applied the BSL as a cleanup level that must be met for surface sediments within the site, whether or not the area-wide average concentration of mercury exceeds the BSL. This conservative application of the BSL provides a substantial additional level of protectiveness to site cleanup decisions.

Consistent with the SMS regulations, sediment cleanup levels apply to the sediment bioactive zone. Previous studies performed as part of the RI/FS documented that this zone consists of the upper 12 centimeters of the sediment column. The cleanup levels do not directly apply to subsurface sediments, but remedial action objectives require that the potential risks of the exposure of deeper sediments be considered and be minimized through the implementation of the cleanup action.

## Cleanup Levels for Other Media

Under certain remedial scenarios, the sediments at the site could also be regulated under other programs with regulatory cleanup levels different from SMS criteria, or could potentially impact other media. For example, if the sediments were excavated and were reused as upland soil, then MTCA soil and/or groundwater cleanup levels could be relevant. Additional criteria considered include state and federal water quality criteria, the Puget Sound

Dredged Disposal Analysis program (PSDDA), the State of Washington Dangerous Waste Regulations, and the federal Resource Conservation and Recovery Act (RCRA).

## 2.4.3 Sediment Cleanup Techniques

Different techniques can be used for the cleanup of contaminated sediments. Some of the most common cleanup techniques are summarized in Figure 2-1. The techniques include both active (i.e., dredging to remove impacted sediments) and passive (i.e., allowing nature to naturally isolate impacted sediments) measures.

The goals of each technique are 1) to isolate and confine contaminated sediments so that plants and animals are no longer exposed to the contamination, and 2) to ensure that the sediments within the bioactive zone comply with site cleanup levels. Often, more than one technique is used for cleanup, with different techniques being applied in different site areas. The RI/FS includes detailed discussion of the different sediment cleanup techniques. The main cleanup techniques applicable to the Whatcom Waterway site include the following:

- **Monitored Natural Recovery:** Natural recovery is similar to capping in that it results in containment of the impacted sediments beneath a layer of clean material. The difference between natural recovery and capping is that in natural recovery, the containment is achieved by allowing natural sediment deposition to bury the impacted sediments. The process occurs naturally in areas like Bellingham Bay where rivers are discharging clean sediments at rates that will cap contaminated sediments naturally in the absence of human interference.

- **Institutional Controls:** Institutional controls are mechanisms for ensuring the long-term performance of cleanup actions. They are applicable to most remedies where contaminants are not completely removed from the site, and are applicable to all eight of the remedial alternatives evaluated in the Whatcom Waterway RI/FS. Institutional controls involve administrative and legal tools to document the presence of contaminated materials, regulate the anthropogenic disturbance/management of these materials, and provide for long-term care of remedial actions including long-term monitoring.

- **Containment by Capping:** Capping is an effective technology for use with contaminated sediments that are not located in areas where removal is required for environmental, navigation or land use reasons. Capping involves covering the contaminated sediments with a layer of clean material that will be physically stable under site conditions. Capping avoids resuspension of contaminated sediments that can occur with sediment removal. Appropriately sited and designed caps can also enhance aquatic habitat conditions.

- **Sediment Removal by Dredging:** Sediments can be removed from the aquatic environment through dredging. Typically dredging is used when impacted sediments are located in areas that conflict with navigation and land use priorities, or where the sediments are not stable if left in place. There are multiple different dredging methods, applicable to different site conditions. Section 4 of the RI/FS document includes a discussion of the different dredging methods and their typical applications. A single project may use multiple types of dredging, with different methods applied in different areas.

- **Confined Disposal Options:** One option for managing contaminated sediments that are removed by dredging is to contain them within specially constructed facilities on the waterfront. The two most common types of waterfront containment facilities are Confined Aquatic Disposal facilities and Confined Nearshore Disposal facilities:

  - Confined Aquatic Disposal (CAD): The CAD technique places the dredged contaminated sediment in a submerged location, and caps (covers) it with clean material. CADs are designed and placed in the locations where they will always be underwater. The thickness of the cap and the grain size of the cleanup sediment are designed to prevent contaminants from migrating back into the aquatic environment. With appropriate design and planning, the surface of the CAD can represent a significant habitat enhancement.

  - Confined Nearshore Disposal: This technique, also known as "nearshore fill" is a type of landfill constructed in aquatic locations along the shoreline. A berm is constructed of clean material to enclose the proposed fill area. Then the dredged sediments are placed within the fill area. The fill is continued so that the upper fill layer is "dry ground" above the tide level. The fill is capped with clean material. Nearshore fills create new land that can be used, but they eliminate aquatic habitat in the areas filled and converted to dry land uses.

- **Upland Disposal:** Sediments removed from the waterfront can be managed by disposal in existing permitted disposal sites. This method has been used extensively within Puget Sound where capping, natural recovery, and/or aquatic disposal options were not suitable for management of all impacted sediments. Under this technique the sediments are barged to an offload facility and are then transported to an upland landfill in trucks or in railcars. The upland landfills are contained and monitored consistent with state, local and federal regulations. The technique is typically more expensive than other options.

- **Beneficial Reuse:** In some cases, sediments may require removal (e.g., to address land use or navigation needs, or to access other materials) but remain suitable for reuse in aquatic or upland areas. This reuse is known as beneficial reuse. It is similar to recycling in that it conserves other natural resources (e.g., reuse of sandy sediments for capping reduces the need to quarry new sand materials).

- **In-Place Treatment of Dredged Sediments:** Techniques to treat sediments in place, without first requiring their removal have been explored by Ecology, EPA, and others. One such technology was tested at the Whatcom Waterway site as part of the RI/FS process, but it was not found to be effective. Different types of in-place treatment technologies are discussed in the RI/FS document. But workable techniques have not been identified that would be successful at the Whatcom Waterway site.

- **Treatment of Dredged Sediments Prior to Disposal:** In some cases it may be appropriate to treat removed sediments prior to disposal of the sediments. For example, sediments that are loose and that have high moisture contents can be treated to remove excess water. This reduces the transportation impacts and the required landfill space used in the ultimate disposal. The appropriateness of treatment technologies varies with the type of material and the type of disposal.

The project cleanup alternatives evaluated in the RI/FS use the above-listed cleanup techniques, in different combinations, to accomplish remediation of the site. The RI/FS alternatives are described in Section 4 of this FSEIS, and in Volume 2 of the RI/FS.

# 3 Description of Affected Environment

Section 4 of this FSEIS describes the Project Alternatives and discusses potential environmental impacts, benefits, and mitigation options associated with the different Alternatives. This section provides a description of the environment in which the cleanup will be performed, and highlights features of the environment that are impacted (positively or negatively) by the Alternatives discussed in Section 4.

## 3.1 Overview of Environmental Features

### 3.1.1 Elements of the Environment

SEPA regulations (WAC 197-11-444) define different elements of the environment that should be considered in the development of an EIS. Following EIS scoping, the Comprehensive Strategy 1999 draft and 2000 final EIS documents organized these SEPA environmental elements into five categories. These five categories are used in this FSEIS, and include the following:

- **Geology, Water, Environmental Health:** These factors include both the natural and built environment. The geology element includes soil and sediment stability issues. The water element focuses on water quality. The environmental health element incorporates both the pollution control benefits of conducting the cleanup, as well as potential impacts/benefits associated with implementation of the cleanup itself. The geology, water, and environmental health characteristics of the environment are described in detail in Section 3.2.

- **Fish and Wildlife:** This category includes the fish and wildlife in the project area, the different existing habitats, and the potential changes (positive and negative) to those habitats that may occur as part of the cleanup. The fish and wildlife characteristics of the environment are described in Section 3.3.

- **Land Use, Navigation, and Public Shoreline Access:** This category includes the uses of the project area, including the aquatic areas and nearby shorelines and waterfront properties. The elements within this category focus on community land use planning efforts, and how these plans are either furthered or adversely impacted by the cleanup alternatives. The land use, navigation, and public shoreline access elements of the environment are described in Section 3.4.

- **Air and Noise:** These elements address potential impacts to existing air quality and noise levels, particularly during the construction of the cleanup. The air and noise characteristics of the environment are described in Section 3.5 below.

- **Cultural Resources:** Cultural resources include existing archaeological, cultural, and historical resources that may be impacted by the proposed project. These cultural resource characteristics of the environment are described in Section 3.6 below.

### 3.1.2 Whatcom Waterway Site Units

The Whatcom Waterway site includes different geographic areas of the waterfront. The RI/FS document divides the remediation areas of the site into eight "site units" for evaluation of cleanup alternatives. The RI/FS site units are shown in Figure 1-1. These site units are used in the FSEIS to assist in the discussion of the affected environment and the different impacts/benefits of the project alternatives. The site units and their subdivisions are described below.

#### Outer Whatcom Waterway (Unit 1)

The Outer Whatcom Waterway includes portions of the Whatcom Waterway located offshore of the Bellingham Shipping Terminal. Unit 1 is divided into three subareas:

- **Units 1A and 1B:** These sub-areas are located offshore of the Bellingham Shipping terminal and connect the outer portions of the Whatcom Waterway to deepwater areas of Bellingham Bay

- **Unit 1C:** This portion of the Waterway is located immediately adjacent to the Bellingham Shipping Terminal. Based on bathymetry, this unit is subdivided into Units 1C1, 1C2 and 1C3.

#### Inner Whatcom Waterway (Units 2 and 3)

The Inner Whatcom Waterway extends from the Bellingham Shipping Terminal to the head of the Waterway at Roeder Avenue. The Roeder Avenue Bridge crosses the waterway at that location and precludes navigation further upstream. The Inner Whatcom Waterway has been subdivided into two units designated "Unit 2" and "Unit 3." Each of these site units has been further subdivided:

- **Unit 2A:** Shoaled areas at the head of the 30-foot portion of the 1960s federal navigation channel

- **Unit 2B:** An area between the Whatcom Waterway and the ASB that has been considered for future construction of an access channel as part of ASB marina reuse

- **Unit 2C:** Deep areas of Unit 2, including portions of the federal channel where water depths currently exceed 24 feet below MLLW

- **Unit 3A:** An emergent tideflat area located at the head of the Waterway, adjacent to the Roeder Avenue Bridge

- **Unit 3B:** The shoaled area of the 18ft federal channel in between the emergent tideflat of Unit 3A and Unit 2A.

## Log Pond (Unit 4)

The Log Pond area was remediated as part of an Interim Remedial Action, completed by GP in 2000 and early 2001. The Log Pond action included placement of a sediment cap to remediate site sediments, and additional actions to enhance nearshore aquatic habitat in that area. Multiple rounds of monitoring have been performed, documenting the success of that action, including Year 1, Year 2 and ongoing Year 5 monitoring. However, some enhancements to shoreline edges of the Interim Action cap are required to minimize potential cap erosion, and enhance the long-term stability of the cap. These additional actions are described in Appendix D of the FS Report.

## Areas Offshore of ASB (Unit 5)

The area offshore of the ASB is a relatively shallow-water area, the majority of which has not been dredged for navigation uses. This area of the site is designated as Unit 5. Unit 5 is subdivided in to three subareas:

- **Unit 5A:** Deeper water areas offshore of the ASB

- **Unit 5B:** High-energy nearshore areas on the “shoulder” of the ASB. Some sediments within this area have mercury concentrations that remain above site cleanup levels

- **Unit 5C:** Shallow-water areas along the southeastern shoulder of the ASB, adjacent to the Inner Whatcom Waterway.

## Area Adjacent to BST (Unit 6)

Unit 6 consists of the aquatic lands to the south and southeast of the Whatcom Waterway and Bellingham Shipping Terminal (BST). This area has been subdivided into three subareas:

- **Unit 6A:** Deepwater areas of Unit 6 that comply with sediment cleanup levels

- **Units 6B and 6C:** Deepwater and intermediate-depth areas near the former barge dock where exceedances of bioassay criteria were noted during recent sampling in 2002.

## Starr Rock (Unit 7)

Starr Rock consists of a sediment disposal area used for management of sediments dredged from the Whatcom Waterway and adjacent berth areas during the late 1960s. The area was designated for sediment disposal under project Corps of Engineers permits. The area is located in submerged offshore areas near the natural Starr Rock navigation obstruction. This area is designated as Unit 7.

## ASB (Unit 8)

Unit 8 consists of the interior of the ASB. This facility was constructed by GP in 1978 for treatment of wastewater from pulp and tissue mill operations. The ASB sludges are the most contaminated materials on the waterfront requiring remediation.

## The I&J Waterway

The I&J Waterway sediments were sampled as part of the RI activities. Mercury associated with the Whatcom Waterway site is present at low levels in subsurface sediments in this area. However, testing as part of the RI showed that mercury concentrations did not exceed SMS biological criteria in surface sediments. Characterization of subsurface sediments in the outer portions of the I&J Waterway has shown that the mercury levels do not exceed allowable levels for open-water disposal or beneficial reuse in these areas. No further actions are required under MTCA to address environmental protection in these areas. This area was designated as a no action area during the 2000 RI/FS.

In contrast, contamination of surface sediment with phthalates, nickel, wood waste and other contaminants from localized historical releases has been shown to be present in excess of SMS standards in the inner portion of the I&J Waterway area. During 2003 and 2004, Ecology determined that the I&J Waterway sediments represent a distinct contamination area that was best managed as a separate sediment cleanup site. As described in the RI Report (RI Section 6.1.3) a separate RI/FS is being conducted for this area under an Agreed Order between the Port and Ecology.

Based on the lack of remediation triggers for the outer portion of the I&J Waterway area, and based on the management as a separate site of the inner portion of the I&J Waterway, the I&J Waterway area is not carried forward as a site unit in the Whatcom Waterway FS.

# 3.2 Geology, Water, and Environmental Health

An overview of the geology, water, and environmental health characteristics of the Whatcom Waterway site environment are described below in Section 3.2.1. These characteristics are described in more detail for each of the Site Units in Section 3.2.2.

## 3.2.1 Overview of Key Issues

Background discussion of the geology, water quality and environmental health of Bellingham Bay is provided in this section. This discussion was adapted from the 2000 FEIS, and has been updated by new information.

### Geology, Shoreline Stability, Seismic Conditions

- **Regional Geologic History:** The Bellingham Bay surrounding geology was shaped by various glacial deposits, derived from the advance and retreat of the Cordilleran Ice Sheet between 18,000 and 14,000 years ago. The Chuckanut Formation, constituting the eastern shore of Bellingham Bay from Governor's Point north to Whatcom Creek, consists of sandstone and carbonaceous shale. Stratified outwash sand and gravels are abundant from the mouth of Whatcom Creek west to the edge of the Nooksack River delta, where terrace deposits associated with the Nooksack floodplain have been developed. From the western edge of the Nooksack River floodplain south to Portage Island contains Bellingham Drift sediment, a blue-gray unsorted and unstratified sandy silt and pebbly clay derived from rock debris that melted from floating ice.

- **Area Sedimentation:** The current shoreline of Bellingham Bay is a result of combined effects of natural geologic and oceanographic processes, as well as anthropogenic influences. Sediment material is continually deposited in to the bay as a result of tributary inputs (Nooksack) and shoreline erosion.

- **Anthropogenic Shoreline Modifications:** Before development, large tidal flats were at the mouths of Squalicum, Whatcom and Padden Creeks. In 1892, three waterways were approved for construction in the northeast portion of Bellingham Bay. Whatcom Creek Waterway dredging by the Corps of Engineers began in 1904 and continued, with associated land modifications, up to 1910. Dredge material was used as fill on the mud flats at the mouth of the creek in order to create building sites for wharves, factories, and streets. Filling activities using material from Whatcom Waterway and other waterways (Squalicum Creek and I&J Waterway) occurred along the east and southeast shore of Bellingham Bay between 1940s and 1960s. The shoreline has also been modified by rip-rap and bulkheading.

- **Seismic Conditions:** Western Washington experiences seismic activity related to plate tectonics and has a history of relatively large earthquakes. More then 1,000 earthquakes occur in the state of Washington each year, with 5 to 20 being severe enough to be felt. No major fault lines exist in the study area. However, small earthquakes have been centered in and around Bellingham Bay in the last century.

- **Flooding, Storm Surge and Tsunami Projections:** Flooding, storm surge, and tsunamis (in decreasing order of probability of occurrence) may increase the water levels in Bellingham Bay on rare occasions. Information on flooding in the Whatcom Waterway is obtained from the Federal Emergency Management Agency (FEMA) flood insurance rate maps (FIRMs) for Bellingham (FEMA 2004). FIRM Panel 1213D shows a base flood elevation at the mouth of Whatcom Creek of 8 feet (NGVD 29). This elevation represents a conservatively high 100-year flood elevation of between 12 and 13 feet above mean lower low water (MLLW). Storm surge is obtained by subtracting the highest observed tide on 5 January 1975 from the predicted tide for that day. The predicted high tide as obtained from NOS (Nobeltec, 2004) for 5 January 1975 was 9.6 feet. The actual measured high tide was 10.4 feet (MLLW). The difference is a storm surge of 0.8 feet. The properties of the storm, especially the wind speed and direction, are unknown. The storm surge may or may not be independent of any flooding in the area, but is assumed to occur over a sufficiently long period of time to occur over the period of higher high water. Tsunami inundation for Bellingham Bay is given by Walsh et al (2004). In the Whatcom Waterway site area, the tsunami depth of inundation to be between 0 and 0.5 m (0 – 1.6 ft). If a tsunami were to occur, this inundation depth would be added to the water elevation in the bay at that time. This means that the water elevation in the site area may increase by up to 1.6 feet above the tidal elevation at the time. This assumes that the tsunami occurs independently from either flooding storm surge.

- **Shoreline Infrastructure:** The characteristics of shoreline infrastructure in the Whatcom Waterway site area vary significantly from site unit to site unit. However, the infrastructure generally has been developed for industrial water-dependent shoreline uses. The infrastructure generally consists of bulkheaded or armored shorelines, with over-water wharves and structures present in Waterway areas. As described in Section 3.2.2 below, the infrastructure in many area of the Whatcom Waterway is obsolete and does not match the channel depth authorization. Much of the infrastructure is in need of repair or replacement.

## Surface Water Quality

Bellingham Bay measures approximately twelve miles long by three miles wide and opens to the Puget Sound to the south and southwest. The bay is a component of a system of interconnected bays that meet the Rosario Straits and eventually the Pacific Ocean. Most oceanic waters enter Bellingham Bay at depth from the north end of Rosario Strait. Some water also enters through Bellingham Channel. Surface water is exchanged between Bellingham Bay and Samish Bay to the south. A shallow sill limits water exchange to the west through Hale Passage. The average residence time for water in Bellingham Bay is four to five days, but can range from one to eleven days.

Studies performed by Ecology and others in the 1970s found that the water quality in inner Bellingham Bay was historically degraded as the result of direct discharge of municipal wastes, pulp and paper mill process water, and other point and nonpoint source discharges to the bay. Efforts to address contamination problems in Bellingham Bay have been underway since, resulting in substantial reductions in the amount of contaminants discharged to Bellingham Bay and corresponding improvements in water quality over time. NPDES permit requirements have led to the implementation of technology-based controls on wastewater and industrial dischargers to the bay, including the Post Point WWTP, GP's ASB facilities, and stormwater discharges to the bay (Ecology, 1999).

Two water quality limitations in Bellingham Bay were identified in the 1998 Section 303(d) list, which is a required mechanism for states to report impaired water bodies to USEPA. Waters placed on the 303(d) list are required to have a TMDL developed to set allowable limits of pollutants into the water body. A TMDL for sediment contamination by toxic pollutants has been developed for the bay (Ecology, 2001). The 2001 TMDL submittal addressed impairments to Bellingham Bay due to potential toxic effects from contaminated sediments based on the 1998 Section 303(d) list of impaired waterbodies. The TMDL and subsequent TMDL Detailed Implementation Plan (Ecology, 2003b) identified the cleanup of existing contaminated sites under MTCA as the vehicle to attain water quality standards. Outside of the immediate discharge area for several urban streams, potentially toxic substances have not been detected in Bellingham Bay at concentrations exceeding state or federal water quality criteria.

Characteristics of Bellingham Bay surface water and pollution inputs are described below:

- **Bottom Currents:** Bottom currents have a net southward flow throughout the bay at depth. They are relatively consistent throughout the year and typically range from 0.2 to 0.3 meters per second. In the inner bay area, deep currents vary with tidal fluctuations. The currents generally flow toward the Whatcom

Waterway during the incoming tide. During ebb tides, deep currents generally flow in a clockwise direction in the inner bay.

- **Bellingham Bay Freshwater Inputs:** The inner bay is influenced by tidal-induced marine waters and fresh water inputs from four watersheds of the Nooksack River Water Resource Inventory Area (WRIA1) entering the bay. From north to south the inputs are: the Nooksack River, the Lower Squalicum Creek, Whatcom Creek and Padden Creek. A fifth watershed, Chuckanut Creek, discharges into Chuckanut Bay, south of the inner bay. It drains an area of 13 square miles which is minimally impacted by human activities. Some residential and commercial areas are present.

  - **The Nooksack Watershed:** The Nooksack River Watershed (Water Resources Inventory Area 1[WRIA 1]) drains approximately 800 square miles westward into Bellingham Bay. The Sumas system flows northward into the Fraser River in Canada.. The western boundary of the Nooksack River Watershed borders over 130 miles of marine shoreline. (WSU, 2005). The Nooksack River Watershed has been listed under Section 303(d) of the federal Clean Water Act as not meeting water quality standards for fecal coliform (Ecology, 2000).

  - **Whatcom Creek Watershed:** The Whatcom Creek Watershed is drained by Whatcom Creek and flows through the City of Bellingham. Whatcom Creek originates at Lake Whatcom and drains into Bellingham Bay. Lake Whatcom is the largest lake in Whatcom County and covers approximately 5,000 acres in area. Whatcom Creek is an urban stream and is listed under Section 303(d) of the federal Clean Water Act as not meeting water quality standards for fecal coliform and temperature. A TMDL is being developed for Whatcom Creek for fecal coliform. The creek is also impacted by channelization, vegetation removal and urban stormwater runoff. In June 1999, a petroleum pipeline that crosses under Whatcom Creek ruptured, causing a gasoline spill into the creek. The gasoline was ignited, causing a large fire and explosion. The pipeline has been repaired (Ecology, 1999, 2004c). Whatcom Creek is the only natural surface water outlet of Lake Whatcom, a glacially formed lake located in Whatcom County and the largest lake in the Nooksack River Watershed. Lake Whatcom supplies drinking water for more than 85,000 residents in Bellingham and Whatcom County, as well as process water for several industries. The City of Bellingham diverts flow from river mile 7 of the Middle Fork of the Nooksack River into Lake Whatcom. Water is diverted through a tunnel under Bowman Mountain to Mirror Lake. Water from Mirror Lake flows to Lake Whatcom via Anderson Creek. The City of Bellingham operates a control dam at the outfall of Lake Whatcom as it enters Whatcom Creek. A TMDL is underway for Whatcom Lake for dissolved oxygen and fecal coliform impacts (Ecology, 2004c). Like many municipalities, the City of Bellingham employs Whatcom Creek and its tributaries as part of the stormwater conveyance system. In areas with a high percentage of impervious surfaces, stormwater runoff is a major source of bacteria pollution in streams. Currently 23.6% of the total Whatcom Creek watershed area is covered with impervious surface (Ecology, 2004c).

  - **Squalicum Creek Watershed:** The Squalicum Creek watershed drains 26 square miles of land. Squalicum Creek originates at Squalicum Lake and also flows through Bellingham. The combined creeks and tributaries of the watershed combine to form 84 kilometers of stream habitat that drain water from land of varying uses. As an urban stream, the creek is influenced by channelization, vegetation removal, and urban storm water runoff (Ecology, 1999, 2004b).

- **Stormwater and Industrial Discharges:** In addition to these natural discharges, the City maintains a stormwater collection and conveyance system that includes eighteen storm drains that discharge to Bellingham Bay. Stormwater discharges are a potential source of water and sediment contamination to the bay, and the city is regulated under Phase II of the federal NPDES Storm Water Program. The City of Bellingham stormwater program, along with other permitted discharges described in the Inner Bellingham Bay Sediment TMDL, are described below. A total of 40 waterfront or surface water discharge source locations to the bay were identified. The potential sources included 10 waterfront NPDES discharges, 12 suspected or confirmed contaminated sites, and the 18 city storm water outfalls. However, no ongoing sources have been identified that have the potential to affect water or sediment quality beyond the immediate discharge zone.

  - **City of Bellingham Stormwater System:** The City of Bellingham originally developed a local stormwater program and submitted it to the Department of Ecology in 1999. It included an extensive source cleanup program, which incorporated vactor truck waste activities. After review of the program, Ecology recommended that the city concentrate on improvements in following two areas: 1) coordinate the stormwater program with the planned sediment cleanup in Bellingham Bay; and 2) improve the stormwater plan requirements for redevelopment.

Bellingham is also a "Phase II" city in the federal stormwater NPDES permitting program, which requires stormwater programs meeting the federal requirements to be in place (Ecology, 2001).

- **Port of Bellingham Stormwater Program:** The Port leads environmental protection efforts at its properties around Bellingham Bay. As part of this role, the Port recently created a Stormwater Master Plan for Squalicum Harbor. The Plan conforms to the City of Bellingham's stormwater requirements as well as the Department of Ecology's Puget Sound Stormwater Technical Manual for all development and redevelopment activities in the Harbor. The Stormwater Master Plan includes a series of pollution prevention operational and structural BMPs and treatment alternatives to reduce or eliminate adverse impacts from Port activities on stormwater and receiving waters. The planned efforts for Squalicum Harbor and Marina are intended to provide a model for Port source control activities throughout Bellingham Bay. The Port also carries three baseline general stormwater NPDES permits for facilities that drain to or otherwise potentially impact Bellingham Bay. One general permit is for the Bellingham Airport. The Port also has coverage for the maintenance shop near the shipping terminal on Whatcom Waterway and for the Alaska ferry terminal in Fairhaven. Data for these facilities covered under the general permit does not show they are a source of sediment contamination (Ecology, 2001).

- The C Street CSO is regulated under the Bellingham Post Point NPDES Permit (No. WA-002374-4). Post Point is the location of the city's Waste Water Treatment Plant (WWTP). Department of Ecology records show that there have been three CSO overflow events since 1995. However, the City has made substantial system improvements in recent years to minimize overflow events. In addition the C Street stormwater discharge was identified as an outfall of concern in the development of the City of Bellingham Comprehensive Stormwater Program and under the NPDES general stormwater program.

- **Bornstein Seafoods:** Bornstein Seafoods carries a State Waste Discharge Permit (ST7304) for the discharge of screened seafood processing wastewater to the Bellingham Post Point WWTP. They have a Baseline General Permit for Industrial Stormwater (SO3-000679). The Department of Ecology administers both permits. Bornstein Seafoods is not identified as an ongoing source of contaminated sediments (Ecology, 2001).

## Soil and Groundwater Quality

Several upland and shoreline properties in the vicinity of the Whatcom Waterway site are cleanup sites managed by the Department of Ecology under MTCA regulations. These include the following:

- **Holly Street Landfill:** The Holly Street Landfill site is a 13-acre historic solid waste landfill located in the Old Town district of Bellingham. In the late 1800s, the site was part of the original Whatcom Creek estuary and mudflat. Around 1905, private property owners began filling portions of the site with dredge spoils and other materials to increase useable upland areas. From 1937 to 1953, municipal waste was used by owners to fill private tidelands within the former Whatcom Creek estuary. Wastes, including debris and scrap materials, were disposed of according to landfill disposal practices of the time (Ecology, 2004a). Solid waste covers approximately 9.1 acres on the northwest side of Whatcom Creek and 3.8 acres on the southeast side (Maritime Heritage Park). The City of Bellingham currently owns 8.3 acres of the 13-acre landfill site, including all landfill properties located along the Whatcom Creek shoreline (Ecology, 2004a). Refuse along the northern shoreline of Whatcom Creek was excavated in conjunction with construction of an engineered cap, and material will be placed along the southern shoreline to stabilize the bank. The northern shoreline excavation and cap system controls releases of copper and zinc to Whatcom Creek that occur when estuary water mixes with the solid waste in the bank. The cleanup also included long term protection through legal restrictions on property use and monitoring of the cleanup action. Excavation for the project removed approximately 12,400 tons of solid waste, primarily from the northern bank prior to constructing the cap with clean materials (Ecology, 2004a).

- **Cornwall Avenue Landfill:** The Cornwall Avenue Landfill site, located at the south end of Cornwall Avenue, measures approximately eight acres and is adjacent to Bellingham Bay. Most of the site was originally tide flats and sub-tidal areas of Bellingham Bay. From 1888 to 1946, the site was used for sawmill operations, including log storage and wood disposal. From 1946 to 1965, the Port of Bellingham held the lease on the state-owned land. The property was subleased to the City of Bellingham from 1953 to 1962. The City used the site for municipal waste disposal. The City continued waste disposal at the site under a sublease from American Fabricators from 1962 until 1965. Landfill operations ended at the site in 1965, and a soil layer was placed on top of the municipal waste (Ecology, 2004a). Previous environmental investigations of the site indicate the presence of hazardous substances in groundwater, surface water, soil and sediments above state cleanup standards. These substances include arsenic, copper, lead, mercury, silver, zinc, cyanide, polychlorinated biphenyls (PCB), bis(2-ethylhexyl) phthalate, PAH compounds and fecal coliform. The Port is leading the completion of an RI/FS for cleanup of this site in coordination with the City and DNR. The completion of this study is expected during 2006 and will include remediation measures for impacted uplands and nearshore sediments. Ecology is ensuring that cleanup activities are appropriately coordinated with the adjacent RG Haley site.

- **RG Haley Site:** Soil and groundwater at this upland contaminated site contain concentrations of pentachlorophenol, petroleum and associated constituents that exceed water quality and sediment protection criteria, respectively. In 2001, an oil seep was observed discharging into Bellingham Bay from the shoreline along the northern boundary of the site. An investigation revealed that portions of the site were contaminated with chemicals consistent with the site's former use as a wood treatment facility. The contaminants were found at levels exceeding state regulatory cleanup levels in surface water, shallow groundwater, sediment and soil (Ecology, 2004a). The visible release of contamination from the site into Bellingham Bay was controlled through the installation of a barrier wall and a product recovery system. The temporary contaminant recovery system continues to operate. An RI/FS is being conducted under an Agreed Order with Ecology and a draft report is scheduled to be released for public review during 2006. The cleanup at this site will include remediation of impacted uplands and nearshore sediments. Ecology is ensuring that cleanup activities are appropriately coordinated with the adjacent Cornwall Avenue Landfill site.

- **Central Waterfront Site:** The Central Waterfront site includes four former cleanup sites that have been combined into a single site to comprehensively manage commingled groundwater contamination. The site includes properties formerly known as the Roeder Avenue Landfill, the Chevron Bulk Fuels Facility, The Boat Yard at Colony Wharf, and the Olivine Uplands site (Ecology, 2004a). The Roeder Avenue Landfill was a bermed municipal landfill operated between 1965 and 1974. The Chevron Bulk Fuels Facility is located along C-Street and is an area where soils and groundwater are impacted by petroleum hydrocarbons associated with historic fuel handling practices. This has been purchased by the Port of Bellingham. The Boatyard at Colony Wharf is an operational boatyard. Soils and groundwater at the site are impacted by low levels of metals contamination, principally copper. Petroleum has also been detected in soil and groundwater. The site has been purchased by the City of Bellingham, and cleanup activities are being managed by the Port under an Interlocal Agreement with the City. The Olivine site was formerly used by previous Port tenants for operation of a lumber mill, and later for operation of a rock crushing plant. Contaminants identified at the site include petroleum hydrocarbons, PAHs, and low levels of heavy metals, principally nickel. The Port and City are conducting the cleanup of the Central Waterfront site and expect to complete an uplands RI/FS for public review in early 2007 under an Agreed Order with Ecology.

- **Chlor-Alkali Plant:** The chlor-alkali plant site was recently acquired by the Port from GP. Soils and groundwater at that site contain elevated levels of mercury from historic operations of the chlor-alkali plant by GP. Two rounds of RI/FS investigations have been performed at the site, and additional studies were performed as part of the Whatcom Waterway Log Pond Interim Action. Results indicate that soil and groundwater conditions at the site do not represent a current source control concern for Whatcom Waterway site sediments or surface water quality. The Port, GP, and Ecology plan to amend an existing Agreed Order to complete an RI/FS of this site.

- **Former GP Pulp and Tissue Mill Site:** The Pulp and Tissue Mill site was also recently acquired by the Port from GP. This property has been used since the early 1900s for pulp and tissue mill operation. Some impacts to soil and groundwater were identified at the site during environmental investigations performed at the site during 2004, and the site was listed by Ecology as a contaminated site. The key issues at the site include petroleum contamination near old bunker fuel storage areas, and low-level metals impacts in groundwater near the former acid plant area of the pulp mill. Based on patterns of sediment contamination in the Whatcom Waterway, neither of these areas appears to represent an ongoing source of contamination to Whatcom Waterway sediments. However, additional actions will be required to address these contamination problems and finalize plans for site cleanup and redevelopment of the Pulp and Tissue Mill site. Under the terms of the GP property acquisition, the Port will conduct the investigation and cleanup of this site, with oversight by the Department of Ecology.

## Sediment Quality and Source Control

Sediment quality issues have been directly evaluated by the Whatcom Waterway RI/FS process. Readers should refer to that document for a thorough discussion of site conditions. This section provides a brief summary of that information.

- **Sedimentation Patterns:** The Nooksack River, Whatcom Creek, Squalicum Creek, Chuckanut Creek, and Padden Creek Watersheds contribute sediment to Bellingham Bay. The largest volume of water and sediment entering Bellingham Bay is the Nooksack River. As previous discussed, dredging and shoreline modifications have affected the natural sedimentation process in

Bellingham Bay. This is particularly true in the inner bay, where industrial and commercial/shipping activities have been focused. The "net sedimentation rate" is a measure of the long-term burial rate of sediments beneath more recently deposited sediment materials. (Within contaminated areas of Bellingham Bay, this measurement provides an indication of how rapidly "clean" sediments are being deposited over contaminated material.) The net sedimentation rate in inner Bellingham Bay has been estimated at roughly 1.6 cm/year. Estimates of net sedimentation rates within Whatcom Waterway has been determined using sediment core studies and by calculating net changes in mud line elevation of the waterways between 1975 and 1996. These rates vary considerably within the channel area, ranging from 0 to 9.4 cm/year.

- **Sediment Bioactive Zone:** Sediment is the material suspended in or settled on the bottom of a water body. It is typically a mixture of sand, silt and clay. When describing the characteristics of sediment, reference to different sediment layers is made. "Surface" sediments reside directly below the mud line and represent the "biologically active zone." The extent of the surface sediment layer can vary from site to site, and may extend to a depth of between 10 and 16 centimeters below mud line within the bay. Previous evaluations for the Whatcom Waterway site indicated that the bioactive zone thickness within the site averages 12 centimeters. "Subsurface" sediments are located below surface sediments.

- **Sediment Contamination:** As stated earlier, efforts to address contamination problems in Bellingham Bay have been underway since the early 1970s. Over these past 25 years, the amount of contaminants discharged to the bay has been substantially reduced, which has led to improvements in water and sediment quality. However, recent studies have found that certain contaminants continue to persist in sediments, and could pose a potential risk to aquatic organisms that live in these areas. Contaminated sediments occur primarily in localized areas within the northeast corner of the bay. The existing sediment conditions in Bellingham Bay are currently being evaluated through a number of site-specific RI/FS efforts and general status investigations. Of more than 50 chemicals analyzed, three have been regularly detected in Bellingham Bay sediments at concentrations that exceed the current SQS chemical criteria. These chemicals of potential concern are mercury, 4-methylphenol and phenol concentrations. Solid waste accumulations have also been mapped adjacent to the former Cornwall Avenue Landfill. Compliance with sediment cleanup standards considers potential future changes to the surface sediment layer that would result from dredging. In Bellingham Bay, subsurface contamination has been detected in the federal navigation channels. These sediments could potentially be exposed by dredging and become "surface" sediments. A brief description of contaminants of concern is provided here, followed by a description of their occurrence within the study area.

- **Mercury:** A naturally-occurring metal, mercury is ubiquitous within the environment. Elevated concentrations of mercury in the aquatic environment have been associated with chlor-alkali facilities, shipyards, mining operations, dental processes, fungicide applications, and other sources. Releases of mercury to Bellingham Bay peaked during the 1965 to 1971 period, largely related to releases from the GP chlor-alkali facility. However, this source of mercury to Bellingham Bay has since been eliminated. Mercury exists in many forms within the aquatic environment; the three most predominant forms are elemental mercury, inorganic mercury, and methylmercury. The high vapor pressure of elemental mercury makes it possible for this chemical to volatilize from water into air. Inorganic mercury, which comprises the greatest fraction in sediments is strongly absorbed to and transported with sediment particles. Methylmercury is the most toxic and readily bioaccummulated form of mercury. Methylation of inorganic mercury by microbes occurs at or near the sediment:water interface where oxygen has been depleted. Although methylmercury typically comprises less than 10 percent of the total mercury burden in Puget Sound sediments, more than 90 percent of the total mercury present in fish and shellfish tissue is methylmercury. The relationship between total mercury concentrations in surface sediments and tissue in Bellingham Bay was characterized in the Whatcom Waterway RI/FS, and was used to develop site-specific sediment cleanup levels (Ecology, 1999).

- **Phenolic Compounds:** Both phenol and 4-methylphenol are also ubiquitous within the environment, and are often detected in stormwater runoff. Phenol and 4-methylphenol are known degradation products of natural wood products, and accumulations of these compounds in regional sediments is frequently associated with wood material deposits (Ecology, 1999).

- **Sediment TMDL Study:** A TMDL for mercury contamination in sediments was established for the Inner Bellingham Bay in 2001. The TMDL sets an allowable daily load of pollutants to the water body from point and nonpoint sources. Sediment sampling in Bellingham Bay has found mercury and other contaminants at levels that exceed the state Sediment Management Standards chemical criteria. The presence of contaminated sediments in Inner Bellingham Bay has been documented to be due to historical practices. No ongoing sources have been identified as causing violations of marine Sediment Quality Standards (SQS), however, some sources may affect small areas of the bay immediately adjacent to outfall pipes (Ecology, 2001).The key areas of Inner Bellingham Bay on the 303(d) list are identified as Whatcom Waterway, I&J Waterway, GP Outfall, and Harris Avenue Shipyard. Of the more than fifty chemicals analyzed, only those described above were regularly detected at concentrations that exceed current state SQS chemical criteria in the Whatcom Waterway site area. Surface concentrations of mercury, 4-methylphenol, and wood material in the Whatcom Waterway area were significantly lower than concentrations detected several feet below the mudline. These patterns correspond to decreasing surface sediment concentrations over the past 25 years, due to source controls implemented at the GP facility and in other areas of Bellingham Bay beginning in the early 1970's. This process of natural recovery is also a result of the gradual incorporation of clean sediment deposits loading primarily from the Nooksack River Watershed (Ecology, 2001).

- **Sediment Areas Managed Separately:** In addition to the remediation areas being addressed under the Whatcom Waterway site, Ecology is conducting the cleanup of other areas under separate site designations or under the NPDES water quality program. These separate sediment management areas include the following:

  - **I&J Waterway:** Surface sediment sampling in I&J Waterway have been shown to be impacted with contaminants different from those present in the Whatcom Waterway site area. These include phthalates and nickel, and also PAH compounds. The Port is currently conducting a sediments RI/FS for this area under an Agreed Order with Ecology. The completion of that study is expected during 2006.

  - **GP Outfall:** The GP Outfall area was identified as a 303(d)-listed contaminated sediment site in Bellingham Bay due to levels of mercury above the cleanup screening level. A detailed contaminant transport analysis was carried out to evaluate the sediment recontamination potential for mercury for the current discharge levels of the GP Outfall. The modeling process predicted the current GP Outfall discharge will not cause mercury sediment contamination to SQS levels in Bellingham Bay. Furthermore, the dynamic model showed that existing sediments within the immediate outfall area were predicted to recover to below the mercury SQS chemical criteria prior to 1999. Sampling data from 1999 confirmed model predictions and demonstrated that the sediments within the vicinity of the GP outfall comply with SQS cleanup criteria for mercury. In addition, the GP chlor-alkali plant (the mercury discharge source) has been closed and pulping operations have terminated, which will improve the discharge quality from the outfall (Ecology, 2001). Biological confirmatory tests were run on the samples from the three highest-concentration stations in the station cluster. All biological tests passed SQS biological screening criteria. Therefore, the confirmatory biological testing procedures under SMS do not qualify this station cluster as a contaminated sediment site and demonstrates compliance with the SQS criteria through the principal of biological override (Ecology, 2001).

- **Cornwall Avenue Landfill:** The Cornwall Avenue Landfill is managed as a separate cleanup site. The Port is leading the completion of an RI/FS for cleanup of this site, in coordination with the City and DNR. The completion of this study is expected during 2006. Cleanup of this site will be completed after finalization of the RI/FS and development of a Consent Decree.

- **RG Haley:** An RI/FS is in progress at this site. Sediments in the nearshore areas of this site have been impacted by pentachlorophenol, petroleum and selected PAH compounds. The RI/FS is being conducted under an Agreed Order with Ecology and a draft report is expected during 2006. The cleanup at this site will include remediation of impacted nearshore sediments. Ecology is ensuring that cleanup activities are appropriately coordinated with the adjacent Cornwall Avenue Landfill site.

## 3.2.2 Issues by Site Area

Relevant geology, water quality, and environmental health issues are discussed below. The discussion is organized by geographic area using the site units shown in Figure 1-1.

### Outer Whatcom Waterway (Unit 1)

The Outer Whatcom Waterway consists of deep-water areas of the Whatcom Waterway navigation channel. Current water depths in this area vary from approximately 30 feet to greater than 36 feet. These depths are largely the result of historical dredging activities in the Waterway.

Sediments in the Outer Whatcom Waterway are dominated by fine particle size distributions (silts and clays), with a total fines content generally greater than 80%. The TOC content of the sediments is generally between 1 and 5%, consistent with average TOC distribution for the site.

The bathymetry in most areas of the Outer Whatcom Waterway is relatively flat, with slopes flatter than 10H:1V. However, slopes become significant along the outer edges of the Waterway, including at the Bellingham Shipping Terminal. The Bellingham Shipping terminal is an engineered slope, including a pile-supported concrete bulkhead and areas of armored slope.

Surface sediments within the Outer Whatcom Waterway (Figure 3-1) have recovered through sedimentation and natural recovery. All of the surface samples collected recently in this area have passed bioassay testing, and no exceedances of the site-specific bioaccumulation screening level (BSL) for mercury were noted.

Subsurface sediment concentrations in the Outer Whatcom Waterway are generally quite low (Figure 3-2 and Figure 3-3). Previous sediment testing suggests that the sediments in Units 1A and 1B may be suitable for open-water disposal or beneficial reuse. In the areas of Unit 1C, sediment contaminant levels are higher, likely precluding sediments from open water disposal. However, contaminant concentrations are well below those in the most contaminated remaining portion of the site (the ASB sludges).

## Inner Whatcom Waterway (Units 2 and 3)

The water depths within the Inner Whatcom Waterway vary greatly. Existing water depths range from greater than 30 feet below MLLW, to intertidal areas that are exposed at low tide. Areas of shallow-water habitat are predominantly located in Unit 3A at the head of the channel and along the berth areas on either side of the federal channel.

The bathymetry of the federal channel is relatively flat. However, sideslopes along either side of the waterway steepen in the berth areas. Historically these side-slopes were hardened with infrastructure for industrial water-dependent uses. Most shorelines include armored slopes, bulkheads and over-water wharves, consistent with typical deep draft infrastructure requirements as shown in Figure 3-5. However, much of the Inner Whatcom Waterway shoreline infrastructure is in fair to poor condition. In portions of the Central Waterfront, bulkheads have failed in part or in full, and portions of wharves have collapsed. The state of repair for shoreline infrastructure varies parcel by parcel along the waterway.

Currently, the effective water depths for the Inner Whatcom Waterway are controlled by the restrictions of the federal navigation channel. Construction is not allowed past the pierhead line, so the water depths at the pierhead line establish the effective water depth for the Inner Whatcom Waterway. That effective water depth varies from less than zero (in areas where sediments at the pierhead line have shoaled and are exposed at low tide) to a maximum of approximately 22 feet below MLLW. Though the project depth for portions of the federal channel is 30 feet, this depth is not currently maintained in any berth areas, and is not supported by requisite shoreline infrastructure in most areas. Most of the shoreline infrastructure in the Central Waterfront area and near the head of the waterway was established when the waterway project depth was 18 feet. The ability to establish and maintain the full project depth is restricted by the relatively narrow width of the waterway and the existing shoreline conditions.

Sediment texture in the Inner Whatcom Waterway is generally dominated by fine sediments. The total fines content of Inner Whatcom Waterway sediments is generally in excess of 80 percent. However, berth areas are armored with rubble, asphalt debris and armor stone in most areas. Sand and gravel are present in some emergent tideflat areas at the head of the waterway, and in beach areas along-side portions of the waterway.

Whatcom Creek enters the Whatcom Waterway upstream of the Roeder Avenue Bridge. Salinities of the Inner Whatcom Waterway vary with tide stage and flood level of Whatcom Creek, as freshwater discharges from the creek and mixes with saline waters of Bellingham Bay.

Surface sediment (Figure 3-1) quality within most areas of the Inner Whatcom Waterway has naturally recovered. With the exception of localized areas adjacent to the Colony Wharf site and one area near the Log Pond, surface sediments within the Inner Whatcom Waterway comply with SMS bioassay criteria, and mercury concentrations are well below the site-specific BSL. Subsurface contaminant concentrations are relatively low in comparison to the ASB sludges (Figure 3-2 and Figure 3-3). However, previous testing has indicated that sediments removed from the Inner Whatcom Waterway are unlikely to be suitable for open water disposal or beneficial reuse

## Log Pond (Unit 4)

The Log Pond was created as various fills were placed around the area. It was used for log handling and was the location of the original wastewater outfall from the Georgia Pacific chlor-alkali plant to Bellingham Bay, prior to construction of the ASB. A cleanup action consisting of construction of a combination sediment cap and habitat enhancement was completed in the GP Log Pond in 2001.

The Log Pond prior to the Interim Action had a bottom elevation that was typically approximately -10 feet MLLW, with slopes up to the shorelines, and down to approximately -26 feet MLLW at the intersection with the Whatcom Waterway. During the Interim Action, approximately 43,000 cubic yards of sediment were placed, with thicknesses ranging up to 6 feet, with a typical design thickness of greater than 3 feet, and an average thickness as placed of 3 to 4 feet. This brought the bottom elevation up so that it was generally on the order of -3 to -4 feet MLLW, and sloped up to the shorelines, and down to the Whatcom Waterway.

Currently, there are very few structures within the Log Pond. A pile-supported conveyor system exists along the Bellingham Shipping Terminal shoreline, a dolphin (i.e., cluster of pilings) is located within the log pond, and there are numerous pilings along the shoreline. A wharf extends to the southwest, in front of the Log Pond along a portion of the Waterway.

The shoreline prior to construction was generally composed of rip-rap and concrete rubble slopes and wooden and steel sheet-piling bulkheads down to a depth of approximately -5 feet MLLW. These shorelines were left in place through construction.

The sediments in the GP Log Pond prior to construction ranged from sandy to very sandy organic silt and clay with a slightly clayey sand with some gravel near the shoreline. The solids content of the sediments ranged from approximately 25 to 40%, with an average around 30 to 35%. In the northeast end of the pond, a large (>50%) content of shell fragments was noted.

The material placed as part of the Interim Action consisted of beneficially reused dredge materials from two sources. The first was navigational dredging spoils from the Swinomish Channel near La Conner, Washington. This material was a sand, with less than 4% fines, and 1 to 8% gravel. The other material used was dredge material from the Squalicum Creek Waterway in Bellingham. This material was generally classified as a silty clay. A grab sample taken during the 2001 construction indicated that the material was an organic clay, and contained 5% sand, 78% silt, and 17% clay.

TOC concentrations in the GP Log Pond prior to construction ranged from 2.7 to 15 percent, with an average of approximately 6 to 10 percent. TOC measurements were not made of the Swinomish Channel materials. The Squalicum Creek materials were approximately 1.5 to 1.7 percent TOC. The current surface in the GP Log Pond is largely these Squalicum Creek materials.

As described in Appendix D of Volume 2 of the RI/FS, the Log Pond is partially sheltered from prevailing winds. However some westerly winds can enter the Log Pond and subject portions of the shoreline to erosive forces. Remaining areas of the shoreline are protected from these wind and wave forces, though northerly winds and vessel wakes can produce some smaller waves. Cap monitoring has shown good long-term stability for the majority of the cap area. Some erosion effects have been noted in limited shoreline areas of the cap. Enhancements to the shoreline conditions to provide for long-term stability of these areas under site wind and wave conditions are presented in the RI/FS and will be implemented as part of the final remedial action for the site.

As described in the Environmental Design Report for the Interim Action, the subsurface mercury concentrations in the Log Pond are elevated due to historic mercury discharges from the former chlor-alkali plant. Ecology determined that removal of the sediments was not technically practicable. The Log Pond Interim Action has been successful at containing these sediments, and no migration of contaminants upward through the cap or through cap porewater has been observed.

As described in Appendix D of Volume 2 of the RI/FS, most surface sediments within the Log Pond comply with sediment cleanup levels. A localized area of recontamination was noted during Year-5 monitoring in the southwest corner of the Log Pond, adjacent to an area of shoreline not included in the Interim Action cap boundaries. Shoreline enhancements to this area will be performed as part of the final remedial action, including extension of the cap area to include this adjacent area, and placement of appropriately-graded materials to ensure long-term stability of the cap edges.

## Areas Offshore of ASB (Unit 5)

Water depths within Unit 5 vary by area. In Unit 5-B the depths are shallow, ranging from approximately 6 feet to approximately 12 feet below MLLW. Similarly, Unit 5-C water depths are shallow, ranging from approximately 2 feet below MLLW along the edge of the ASB, to depths of approximately 18 feet below MLLW along the Whatcom Waterway.

Water depths in Unit 5-A vary from relatively deepwater (up to 26 feet below MLLW) offshore areas, to shallow water areas adjacent to the ASB (as shallow as 4 feet below MLLW. Depths shoal gradually, consistent with natural bathymetric conditions within the Bay. The depth contours along the Whatcom Waterway edges of these areas have been affected by historic dredging patterns within the Waterway.

The sediments within Unit 5 range from fine-grained sediments in deepwater areas, to sandy sediments with some gravel in shallow-water, high-energy areas of Unit 5-B. The particle size distribution is controlled by area wave energies.

Wave energies in Unit 5-C are lower than in Unit 5-B due to the partial sheltering of this area by the ASB structure and the Bellingham Shipping Terminal. Further reductions in wave energies in this area are anticipated as part of future marina construction improvements.

Throughout most of Unit 5 the surface sediments (Figure 3-1) have naturally recovered and are compliant with site cleanup levels. Subsurface sediment concentrations are relatively low as shown in Figure 3-2 and Figure 3-3. However, wave energies within Unit 5-B are higher than in other areas and have slowed natural recovery rates and the deposition of fine sediments in this area. Recent sampling in 2002 demonstrated that sediments in this area do not exceed bioassay criteria established under SMS. But mercury levels remain elevated within Unit 5-B due to the lower levels of natural recovery in this area.

## Area Adjacent to BST (Unit 6)

Most of Unit 6 consists of deepwater areas, with elevations greater than 18 feet below MLLW. However, shallow-water areas are located immediately adjacent to the Bellingham Shipping Terminal. The shorelines in this area consist of engineered slopes, armored to resist wind and wave erosion.

Sediments in deepwater areas of Unit 6 consist of fine-grained sediments typical of the Whatcom Waterway site. The total fines content typically exceeds 80 percent. TOC levels range from 1 to 5 percent, consistent with average Whatcom Waterway site conditions.

The principle contaminants historically identified in the Unit 6 area are phenolic compounds. The primary source of these compounds appears to be from historical log rafting activities. Natural recovery processes for these materials include both deposition and burial, as well as biodegradation (phenolic compounds are biodegradable under both aerobic and anaerobic conditions).

During sediment testing in 2002, a single failure was noted in an amphipod bioassay test performed at station AN-SS-30 (see Figure 3-1). Mercury levels were below the numeric SQS in this sample. No bioassay exceedances or elevated mercury levels were noted in other areas of Unit 6 during 2002 sampling activities.

## Starr Rock (Unit 7)

Water depths in Area 7 range from a low of approximately 20 feet below MLLW to a maximum of approximately 40 feet. Due to its deepwater location, Unit 7 is not subject to significant wave energies. Sediments in this area are predominantly fine-grained materials, with total fines contents of greater than 80 percent. Like most areas of the Whatcom Waterway, the TOC content of sediments in this area is generally between 1 and 5 percent. Localized deposits of woody materials were noted, with some TOC contents exceeding 5 percent.

The surface sediments (Figure 3-1) within Unit 7 have naturally recovered. Surface sediments in this area do not contain any exceedances of the site-specific mercury BSL, and no exceedances of SMS criteria were noted in sediment bioassays.

## ASB (Unit 8)

The ASB is approximately 1000 feet wide north-south, and varies from approximately 1000 to 1400 feet wide east-west. The ASB berms enclose Unit 8 and separate it from Bellingham Bay. The ASB berms enclose an area of approximately 28 acres.

Figure 3-4 shows in schematic cross-section the construction of the ASB berm. The berms were constructed of quarried sand and stone materials placed at the time of construction. The interior of the ASB was dredged to depths approximately 15 feet below MLLW. A bentonite material was used to reduce the permeability of the berm and make it suitable for wastewater uses. An asphalt surface was placed around the berm interior edges to prevent wind and wave erosion of the berm structure. The outer edges of the berm are armored with stone to protect against wave erosion. Wastewater elevations within the ASB are maintained by active pumping at approximately 19 to 20 feet above MLLW. This elevation is significantly higher than the water elevations in Bellingham Bay, and provides hydraulic head necessary to discharge treated wastewater by gravity flow through the GP-owned outfall.

Since construction of the ASB facility, biotreatment sludges have accumulated in the ASB. These sludges are soft, wet, and are extremely high in TOC content. The solids content of these materials is less than 30 percent and averages about 14 percent. The TOC content is very high, averaging between 30 and 50 percent. The sludges consist of pulp solids and microbial biomass produced during biotreatment of facility wastewaters.

In contrast to the ASB sludges, the berm materials consist primarily of clean coarse sand obtained from quarry sites during ASB construction. These materials were tested for physical properties and chemical properties as part of the Remedial Investigation activities. Sediments underlying the ASB also consist of sandy materials.

The exterior of the ASB was constructed with a final cover of large armoring rock, generally of 300 to 4400 pounds. These exterior slopes were constructed between 2.5 and 3:1 (H:V). The interior slopes are finished at slopes of approximately 2.5:1 (H:V).

As described in the RI/FS, the ASB sludges contain the highest contaminant levels of all of the materials requiring remediation (Figure 3-2 and Figure 3-3). Contaminant levels include elevated mercury levels from chlor-alkali plant wastewaters, but also contain very high levels of phenolic compounds and other inorganic and organic contaminants including cadmium, zinc, phthalates and polynuclear aromatic hydrocarbon (PAH) compounds.

The ASB sludges are soft, wet, and have very high TOC contents. If managed as part of a nearshore fill, these sludges would be subject to primary and secondary consolidation, and would likely produce methane during anaerobic decomposition.

Materials in the ASB berms were directly tested as part of Remedial Investigation Activities. The berm sands were free from anthropogenic contaminants and were suitable for material reuse, provided that ASB sludges are first removed so that the materials can be safely accessed.

# 3.3 Fish and Wildlife

An overview of the fish and wildlife characteristics of the Whatcom Waterway site are described in Section 3.3.1 below. The particular considerations for each of the Site Units are described in Section 3.3.2.

## 3.3.1 Overview of Key Issues

This section describes fish and wildlife habitats in the Whatcom Waterway, which is located on the northeastern side of inner Bellingham Bay. Detailed information on Bay-wide habitat conditions and habitat maps can be found in the Data Compilation Report (Pacific International Engineering and Anchor Environmental, 1999).

Most of the habitats in Bellingham Bay are used by a variety of marine and terrestrial species for feeding, reproduction, rearing, and/or refuge. The Whatcom Waterway specifically hosts various benthic macroinvertebrates (bivalves, crabs, polychaetes), as well as providing habitat or passage for various fish species (both bottomfish and pelagic species such as salmon).

### Types and Functions of Habitats

Three different elevations of habitat are considered within this FSEIS: intertidal, shallow subtidal, and subtidal. Although separated by only a few feet, these three strata have distinct soil textures and support varying plant and animal communities. Each stratum has two types of substrata: sand/mud/ cobble and gravel/rocky shore. The habitat typically found in these strata is summarized here to preface more detailed descriptions of fish and wildlife habitat in the Bay.

- **Intertidal: 4 feet below to 11 feet above MLLW**
    - **Sand/mud/cobble.** This area supports rooted plants to varying degrees, with increased numbers and variety occurring at higher elevations. Native eelgrass is most commonly found at 0 to 4 feet below MLLW, while rushes, sedges, and pickleweed can be found at 11 to 8 above MLLW. These plants provide food and refuge to various organisms, including juvenile salmon, shrimp, crab, and flat fish. Mudflats found in this

substratum support epibenthic prey that are consumed by juvenile salmon migrating through the area. Pacific herring may also use the eelgrass and macroalgae found in the intertidal zone as spawning habitat. The finer substrate at higher elevations (8 to 11 feet above MLLW) provides spawning habitat for sand lance and surf smelt. Premium intertidal habitat of this kind, with the appropriate substrate, energy levels and other conditions providing maximum benefit to juvenile salmonids, is limited in the Whatcom Waterway area to areas at the head of the Whatcom and I&J Waterways, areas along portions of the sides of the Whatcom Waterway, in beach areas at the foot of Hilton Avenue and at the foot of Pine Street and in portions of the Log Pond following completion of the Interim Remedial Action.

  - ► **Gravel/rocky shore.** Native eelgrass is occasionally found in pools and channels on the rocky shores at about 0 feet MLLW. Brown, green, and red algae are also found throughout this area. The higher elevations of this substratum are affected by higher tides; plant material can consist of lichens, some flowering plants, and leadwort. Animals commonly encountered include crabs, shrimp, sponges, sea anemones, worms, sea stars, oysters, and various fish (e.g., perch, prickleback, flat fish, and some juvenile salmon). Fish use this area for feeding, refuge, and reproduction, and this intertidal can represent premium nearshore habitat for juvenile salmonids. Armored and rocky areas of the Whatcom Waterway with this type of habitat are located along the sides of the Whatcom and I&J waterways, along the shoreline of the ASB, and in portions of the Log Pond.

- **Shallow Subtidal: 4 to 10 feet below MLLW**

  - ► **Sand/mud/cobble.** The plant and animal communities and functions in this substratum are similar to those described in lower elevations of the intertidal habitat; a notable exception is native eelgrass, which is typically more common within the -4 to 10 feet below MLLW zone. Mudflats within this substratum support epibenthic prey that is consumed by juvenile salmon migrating through the area. The substrate within this elevation can also provide suitable habitat for Dungeness crab mating and egg brooding. Shallow subtidal areas are located at the heads and along portions of the sides of the Whatcom and I&J waterways, in areas at the foot of Hilton Avenue and Pine Street, in the ASB shoulder area and in the Log Pond.

- **Gravel/rocky shore.** Native eelgrass is occasionally found in this area, as are a variety of brown, red and green algae. Animals common to this substratum include crabs, shrimp, sponges, sea anemones, worms, sea stars, oysters, and a variety of fish such as perch, prickleback, flat fish, and some juvenile salmon. The fish use this area for feeding, refuge and reproduction. Rocky shallow subtidal habitats are located along portions of the Whatcom and I&J Waterways and along the shorelines of the ASB and in portions of the Log Pond.

- **Subtidal: Greater than 10 feet below MLLW**

  - **Sand/mud/cobble.** Native eelgrass is still relatively common between 10 and 20 feet below MLLW; however, beyond 20 feet below, light is limited and eelgrass and macroalgae are less prevalent. Some varieties of hardshell clams are also less abundant with increased depth, while the geoduck clam tends to be more abundant in deeper water. The substrate within this elevation can provide suitable habitat for Dungeness crab mating and egg brooding. The substrate and water column are also used for feeding by a variety of fish, including sub-adult and adult juvenile salmon. Most portions of the Site consist of subtidal habitat with sand or mud bottom.

  - **Gravel/rocky shore.** Larger-sized fish and shellfish often occur in deeper waters. Greater than 20 feet below MLLW, light reaching the sea floor limits the abundance and growth of macroalgae. In addition, the occurrence of some species such as oyster is rare. Rocky subtidal shorelines within the site predominantly occur along the developed shorelines of the Whatcom and I&J Waterways. Some rocky outcroppings occur at subtidal elevations at Starr Rock.

## Fisheries and Invertebrate Resources

Documented fisheries resources for Bellingham Bay include the following:

- **Surf Smelt and Sand Lance:** Surf smelt and Pacific sand lance are common fish that spawn in the high intertidal portions of coarse sand and gravel beaches (WDF, 1992). Surveys by Washington Department of Fish and Wildlife (WDFW) have documented spawning beaches in Bellingham Bay. However, no surf smelt or sand lance spawning has been documented in inner Bellingham Bay, presumably because suitable substrates are not available.

- **Pacific Herring:** Pacific herring spawn in inland marine waters of Puget Sound between January and June in specific locations. There is typically a 2-month peak within the overall spawning season. Herring, which deposit their eggs on marine vegetation such as eelgrass and algae in the shallow subtidal and intertidal zones between 1 foot above and 5 feet below MLLW, are known to congregate in the deeper water of Bellingham Bay. However, only relatively low-density spawning deposition occurs in the Bay, and none of that has been documented in the vicinity of the Whatcom Waterway.

- **Salmonids:** Bellingham Bay is used extensively by anadromous salmon species (Shea et al., 1981). Each of the streams flowing into Bellingham Bay is used by one or more of the economically important species listed in Table 3-1. The Nooksack River has the largest salmon runs in Bellingham Bay, followed by Squalicum and Whatcom creeks. Concentrations of chum, coho, and chinook salmon along the shoreline and in offshore waters in Bellingham Bay peak annually about mid-May. Juvenile coho and chinook salmon appear to have different migration habits. Coho remain in the Bay for approximately 30 to 35 days, while chinooks remain about 20 days. More recent studies on the distribution of chinook salmon (Ballinger and Vanderhorst, 1995) indicate relatively high numbers of juvenile chinook salmon and average numbers of coho salmon use the area in the vicinity of the Whatcom Waterway. Additional information pertaining to salmonid occurrence in Bellingham Bay can be found in the following studies*: Inner Bellingham Bay Juvenile Chinook Study Lummi Natural Resources Data Report* (2005); *NOAA Fisheries 2003 Bellingham Bay Juvenile Chinook Townetting Project Field Sampling and Data Summary* (2004)

- **Groundfish:** Several species of groundfish occur in both shallow and deep waters in Bellingham Bay for part or all of their life. Detailed information on groundfish species and their timing and use of Bellingham Bay is not available. Key characteristics of groundfish occurring in northern Puget Sound are generally applicable to Bellingham Bay.

- **Clams, Geoduck, and Oysters:** Bellingham Bay supports a variety of marine invertebrates, ranging from infauna (worms, clams, and small ghost shrimp that penetrate benthic sediments) to epibenthic plankters (organisms such as very small crustaceans that move off the substrate surface) to larger invertebrates such as oysters, crabs, and shrimp. The predominant bivalves in Bellingham Bay are intertidal and subtidal hardshell clams. Intertidal shell clam types include butter, littleneck, horse, and soft-shell clams and cockles. Subtidal clam resources consist of butter, littleneck, and horse clams. Native oyster and Pacific geoduck are also known to occur in Bellingham Bay (Palm, 1995; WDF, 1981; WDFW, 1992;

Webber, 1974). Shellfish densities are relatively low along the eastern shore of Bellingham Bay in the vicinity of the Whatcom Waterway, although bivalves are the dominant benthic organism within the Waterway (Anchor Environmental, 1999). Scattered oysters also occur along the shoreline of the Whatcom Creek estuary (Palm, 1995). Geoduck, which is only present in a handful of locations in the Bay, does not occur within the Whatcom Waterway.

- **Shrimp:** Seven species of pandalid shrimp, including, pink, coonstripe, dock, and spot shrimp, occur in nearshore and deeper waters of Bellingham Bay. For example, coonstripe shrimp have been observed in intertidal areas immediately offshore of the Cornwall Avenue Landfill (which is just south of the Whatcom Waterway), and this species is common around piers and floats. Shrimp densities in the areas surrounding the Whatcom Waterway are moderate when the Bay is viewed as a whole.

- **Crab:** Crab trawls conducted for the Puget Sound Dredge Disposal Analysis (PSDDA) investigations indicate that the predominate crab resources in Bellingham Bay are the non-edible purple or graceful crab, the edible red rock crab, and the edible Dungeness crab. The highest densities of rock crab occur in relatively shallow water (30 to 45 feet below MLLW) in areas extending from the Lummi Peninsula to inner Bellingham Bay. Rock and Dungeness crab are likely to occur in shallower waters of Bellingham Bay not sampled as part of the PSDDA investigations. Dungeness crab is generally abundant in most areas of Bellingham Bay, and has been documented in the Whatcom Waterway. The northern and eastern shorelines of Bellingham Bay serve as nursery/rearing areas for juvenile Dungeness crab. A shell substrate is a preferred habitat for the first 8 to 10 weeks after larvae settle. However, other substrates, such as small cobbles and gravel, algae, and eelgrass, are also recognized as important rearing habitat for juvenile crab. Because the Whatcom Waterway has relatively limited quantities of these habitats, its usefulness as a nursery/rearing area is likely limited.

## Table 3-1 Salmon and Trout Fisheries in Bellingham Bay

| Species | Fishery |
|---|---|
| Coho | mid-September to mid-November |
| Chum | early November to mid-December |
| Chinook | late July to mid-September |
| Pink | July in odd years |
| Sockeye | no fishery |
| Steelhead | mid-December to January |
| Cutthroat | no commercial fishery |
| Bull trout | no fishery |

## Sea Birds and Marine Mammals

The greater Bellingham Bay area and its shallow estuarine habitats support a number of birds at all seasons. Although Bellingham Bay is not used extensively by large populations of waterfowl, wintering populations tend to be 10 to 15 times larger than summer populations for migratory species (Manual et al., 1979). The Bay is located on the flight path between the Fraser River estuary and Skagit Bay, and is used as a stopover for seabirds and waterfowl migrating between these two areas. Waterfowl sited in Bellingham Bay include brant, snow geese, mallard, widgeon, green-winged teal, and pintail. Bellingham Bay is also used as an over-wintering area for diving birds such as scoter and golden eye. A variety of both natural and man-made habitats provide protection from winter storms habitat to migrant and wintering birds.

Glaucous-winged gulls use inner Bellingham Bay for resting and foraging. Pigeon guillemonts use the shoreline area in and around the Whatcom Waterway for nesting and foraging. The Habitat Restoration Documentation Report (Pacific International Engineering, 1999) describes the individual bird species and their use of Bellingham Bay by season.

Limited information is available on the presence and residence time of marine mammals in Bellingham Bay (PTI, 1989). Bay-wide, several species have been reported: the harbor seal, sea lions, Orca whale, gray whale, and harbor porpoise. As described below, the local population of Orca whale is being listed as endangered under the Endangered Species Act (ESA). The other marine mammals are not threatened or endangered species under ESA, but they are protected from hunting under the Marine Mammal Protection Act. Seals and sea lions have been noted using the Log Pond and portions of the I&J Waterway for resting areas. Migrating gray whales have been noted to enter Bellingham Bay and to feed in subtidal areas of Puget Sound. Orca whales are occasionally observed in and near Bellingham Bay, though they are more typically observed in Rosario Strait and near the San Juan Islands.

## Threatened, Endangered, Sensitive and Candidate Species

Under the ESA, a species likely to become extinct is categorized as "endangered." A species likely to become endangered within the foreseeable future is categorized as "threatened." This section provides information on the occurrence of threatened and endangered bird, fish and marine mammal species in Bellingham Bay.

- **Bald Eagle:** The majority of bald eagle nest sites occur in the eastern portion of Bellingham Bay, primarily in the Nooksack River delta along the shoreline and in inland areas of the Lummi Peninsula. There are also some nests along the shoreline of Portage Island and Chuckanut Bay. Nest trees in the Pacific Northwest are typically tall conifers located in forested or semi-forested areas within about 1 mile of large bodies of water with adequate food supplies. Marine and freshwater fish are eagles' preferred prey; birds contribute a smaller proportion of the eagle diet. Prey may also include small mammals. Nesting eagles generally forage within 10 square miles of their nest site. Thus, while the Whatcom Waterway vicinity does not appear to provide eagle habitat, it may serve as a food source. The bald eagle was removed from the federal threatened and endangered species list on June 27, 2007. (Federal Register Volume 17, Number 130, pages 37373 to 37374) The bald eagle is still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

- **Peregrine Falcon:** Peregrine falcons are also found in Bellingham Bay. They feed almost exclusively on birds captured in flight, particularly waterfowl, shorebirds, and game birds. Peregrine falcons typically nest on cliff ledges greater than 150 feet in height that are close to the water. Peregrine falcons were removed from the federal threatened and endangered species list in 1999. The Whatcom Waterway has no documented Peregrine falcon nests.

- **Marbled Murrelet:** Open water concentrations of marbled murrelets have been recorded in the central portion of Bellingham Bay. Murrelets forage in the marine environment typically up to 2 miles near a coastline. The species forages year round in waters generally less than 90 feet deep, sometimes congregating in well-defined areas where food is abundant. These birds generally do not utilize shallower waters less than 30 feet deep. Marbled murrelets reportedly feed on a wide variety of prey, including sand lance, Pacific herring, and other marine taxa such as crustaceans. Murrelets require old growth or mature forest composed of conifers, including Douglas fir, western red cedar, Sitka spruce, and western hemlock. There are no known nest sites along the shoreline of Bellingham Bay, and no clear association between these birds and the Whatcom Waterway.

- **Salmon:** On March 16, 1999, the National Marine Fisheries Service (NMFS) added nine West Coast salmon to the Endangered Species List. Of the nine listed species, one occurs within the project area: the Puget Sound chinook salmon, which was listed as a threatened species. Two races of chinook salmon (spring and fall) are found in Bellingham Bay. The timing of adult migration to freshwater differs between these two races, but the timing of the return of adult fish, spawning, and emigration of juveniles overlap. Fall chinook is the most common run of chinook salmon observed in Puget Sound. Juvenile fall chinook generally emigrate to the estuary between February and August as sub-yearlings (within the first year after being spawned) or as yearlings. Individual fish may only use Bellingham Bay for a period of days to a few weeks before heading into the greater Puget Sound estuary. They may use the estuaries and intertidal areas between April and November for further rearing and growth. As juvenile fish move into neritic habitats, they preferentially consume emergent insects and epibenthic crustaceans in salt marsh habitat or decapod larvae, larvae, and other prey (Simenstad et al., 1991). Whatcom Creek and the Whatcom Waterway are utilized by salmon, although the Whatcom Waterway serves more as a migration corridor between Whatcom Creek and the Whatcom Creek Estuary than nursery/rearing habitat given the lack of suitable substrate and refuge. Steelhead have also been recently added to the Endangered Species List but the Steelhead "Critical Habitat" has yet to be defined.

- **Bull Trout:** Bull trout, listed as a threatened species under the ESA by the USFWS, are a member of the North American salmon family. Bull trout occur in the Nooksack River, and presumably spend some time in Bellingham Bay. Many are resident to a single stream; others migrate on a fluvial (i.e., spawn in headwaters streams and live downstream in larger rivers) or adfluvial basis (spawn in streams but live in lakes). Bull trout tend to prefer cold, clear waters (no more than 64 degrees Fahrenheit). Whatcom Creek does host bull trout, indicating that the trout use the Whatcom Waterway as a migratory path if not a refuge and rearing area.

- **Orca Whales:** On November 15, 2005, the National Oceanic and Atmospheric Administration (NOAA) Fisheries announced its decision to list the North Pacific Southern Resident Orca whale (Orcinus orca) population as endangered under the Endangered Species Act (ESA). The listing was effective on February 6, 2006

(50CFR 223/224). The listing is specific to the three resident whale pods (J, K, and L pod) with spring through fall ranges in Puget Sound and the Straits of Georgia and Juan de Fuca. This population was previously (December 16, 2004) proposed for listing as threatened. NOAA Fisheries has announced that they are preparing language for proposed Orca whale critical habitat for this population. A number of factors have been identified by NOAA Fisheries as having resulted in the listing of these Orca whales as endangered. Sound and disturbance from vessel traffic, toxic chemicals which accumulate in top predators, and uncertain prey availability (primarily salmon) all have been identified as concerns for the continued survival of this population. The small number of whales in this group, and relatively slow rate of population recovery since a 20 percent population decline during the 1990s also puts this historically small group at risk of extinction during a catastrophic event such as an oil spill or disease outbreak..

## Priority Restoration Opportunities

In the Final Habitat Restoration Documentation Report for the Bellingham Bay Demonstration Pilot Project, the Habitat Subcommittee identified the following target species for Bellingham Bay.

- All salmonid species including Cutthroat trout and Steelhead
- Dolly Varden (bull trout)
- Bull trout (thought to occur in the Nooksack River)
- Sand lance and surf smelt
- Pacific herring
- Ling cod
- Flatfish (e.g., English sole)
- Pandalid shrimp
- Dungeness crab
- Hardshell clams.

Based on the recent listing of the Orca whales, it appears appropriate to target restoration activities on those actions that would also support protection of those marine mammals.

In addition to the listing of target species, the Habitat Subcommittee identified the following focused habitat restoration/protection objectives:

- Provide clean sediments to support functions and species

- Restore the 200+ acres of historical native eelgrass bed that was formerly located in inner Bellingham Bay to the extent possible

- Restore/enhance degraded estuaries of Whatcom, Squalicum, Padden, and Little Squalicum Creeks to support salmonids, salmonid prey, and functions such as refuge, feeding, and rearing
- Restore/enhance/protect viable habitat that provides connective corridors between estuary and open water habitats and between other habitats in the open water environment
- Restore/enhance/protect natural habitat forming processes that create and maintain habitat
- Net gain in aquatic area and function
- Preserve existing viable habitat that tends to either concentrate sensitive life history stages and/or supports large numbers of species of concern
- Maximize habitat restoration/protection opportunities (including marine buffer) with remediation and/or shoreline projects
- Restore lost habitat attributes by removing shoreline fills, shoreline landfills, remnant structures, and removing/replacing treated timber structures.

Specific habitat opportunities prioritized under the Pilot were generally those that achieve restoration and enhancement of habitat for juvenile salmonids. In general, the actions that achieve restoration of salmonid habitat are beneficial to marine mammals including Orca whales. Habitat for juvenile salmon would improve due to the project; therefore, the availability of this important class of prey may increase. The following discussion addresses priority issues related to enhancement of salmonid habitats in Bellingham Bay.

While many species of salmonids may be present in nearshore estuarine and marine waters of Bellingham Bay, those species that enter saltwater early during their first year (some chinook, chum, and pink salmon) are typically considered to be more nearshore reliant. These fish are predominantly surface oriented, inhabiting the top meter or two or the water column moving in and out with the tides over shallow subtidal and intertidal areas.

These juvenile salmon are nearshore dependent for two main reasons, forage opportunities and refuge from larger, deeper water predators. They feed on organisms at the water-substrate interface (epibenthos), in the water column (plankton), and at the surface (neuston). Chum and chinook early in their saltwater residence feed primarily on epibenthos, although some neustonic and planktonic feeding occurs, especially as fish become larger. Pinks feed primarily on plankton from their initial entry into salt water. A number of physical and biological factors in the nearshore environment interact to create conditions that can enhance or detract from forage and refuge opportunities.

Four physical factors in particular, tidal elevation, substrate type, and slope, and salinity influence habitat suitability for these fish, all of which can be modified by exposure to current or waves. Habitat that optimizes each of these factors represents premium habitat for juvenile salmonids..

- **Tidal Elevation:** Tidal elevation of a particular area dictates the duration of tidal exposure (dry periods between tides). This affects the conditions that can develop at different elevations. Shallow subtidal areas experience relatively high light levels, but essentially no tidal exposure. Larger macroalgae, eelgrass, and other organisms that might be susceptible to desiccation can survive at these elevations. The vegetation in this area supports prey organisms and can provide refuge for juvenile salmon. These fish spend a relatively small proportion of their time in waters over this elevation (primarily during very low tides) because they are primarily surface oriented. Low to middle intertidal areas (-4 to +4 ft MLLW) experience relatively short periods of tidal exposure, averaged over an entire season, and also receive a great deal of light. This area can be very productive for desiccation resistant macroalgae and invertebrate populations, including those epibenthos on which chum and chinook feed. Because they move in and out with the tides, juvenile salmon also spend a large proportion of their time in water over substrate at low to middle tidal elevations. While juvenile salmon spend relatively little time at higher tidal elevations (e.g., above MHHW, 8.46 MLLW in Bellingham Bay), the fringing salt tolerant plants that thrive in these areas can produce invertebrates, including chironomid fly larvae which also are important prey organisms. Tidal elevation characteristics relative to light and duration of exposure are not substantially altered with differences in wave or current regimes in shallow subtidal areas. The upper range of low to middle intertidal macroalgae may be expanded as desiccation during tidal exposure is reduced due to wave action, and the upper intertidal and supratidal areas, or “splash zone” can be expanded to even higher elevations, increasing upper range of salt tolerant plants.

- **Substrate Type:** Substrate type is a factor in providing suitable foraging opportunities for juvenile salmon. The epibenthic invertebrate assemblage can vary both in terms of composition and density based on substrate type. Generally, finer substrates (e.g., silts, sand, and mud) are correlated with higher densities of those epibenthos on which juvenile salmon most often feed. This includes both those organisms associated with the substrate itself, and those organisms associated with aquatic vegetation (e.g., eelgrass). An exception to this generality is where exposure to wave or current energy is relatively high, in which case more coarse substrates (e.g., gravel or cobble) are correlated with higher densities of epibenthos. This is particularly the case with those organisms associated with macroalgae (e.g., certain types of amphipods), is more likely to be present or accumulate in areas with coarser substrate. Coarser substrates also allow for more dissipation of water energy on the substrate surface.

- **Slope:** Slope is a factor that affects both foraging and refuge function of nearshore environments. Shallower slopes, particularly in the lower to middle tidal elevations, improves conditions for epibenthos, and therefore juvenile salmon foraging opportunity, by reducing desiccation rates during tidal exposure. They increase retention of organic detritus for processing into the food web at the epibenthic level. Shallower slopes also provide greater functional habitat area for juvenile salmon at given tidal elevations. Because juvenile salmon stay in the top meter or two of the water column, tidal profiles that allow them to stay in shallow water during most or all stages of the tidal cycle provide refuge from deeper water predators, including larger salmonids that feed from below. By contrast, steeply sloped nearshore areas provide less total area of less productive habitat at any given elevation, and little if any refuge from predators deeper in the water column. There are exceptions to this general case depending on wave exposure. In highly exposed areas, and shallowly sloped nearshore area will experience significantly more wave run up and a higher energy surf-zone that may outweigh the benefits of greater and higher functioning habitat area, and also shallow water refuge. Steeper slope profiles at specific elevations and/or coarser substrate can mitigate wave run up and surf break in higher energy areas.

- **Salinity:** Salinity influences habitat suitability for juvenile salmon by determining the physiological regime and the biological assemblage. The biological assemblage, including aquatic vegetation and invertebrates, of a given area is strongly tied to salinity. In areas of freshwater input, like the Whatcom Waterway, a salinity gradient exists along which this assemblage shifts from freshwater to marine organisms, with specialists in estuarine conditions in the middle. Surface oriented juvenile salmon in the nearshore, particularly chum and chinook, forage extensively in estuarine habitats. This is the case both for fish in their natal estuaries, and also fish that have already entered salt water and subsequently encounter lower salinity conditions. Low salinity areas are limited habitats in inner Bellingham Bay and provide important habitats for juvenile salmonids undergoing the physiological transition to saltwater.

In summary, the characteristics of premium habitat for juvenile salmonids and other selected species requires the optimization of multiple factors. The functions and values of the created habitat vary depending on this collection of factors.

## Habitat Issues and Navigation Infrastructure

Portions of the Whatcom Waterway site area have been developed for navigation uses with infrastructure improvements. This infrastructure affects the types of habitat conditions that are present in these areas. Other than depth modifications (i.e., dredging) the main types of navigation infrastructure that exist in the Whatcom Waterway site area include bulkheads, armored slopes and over-water structures. These are illustrated in Figure 3-5. Habitat considerations associated with these features are described below:

- **Bulkheads:** The term bulkhead refers to constructed sheer vertical walls that stabilize the shoreline. Typically they are concrete or metal sheet pile, although many older bulkheads are constructed from treated timber. In the Whatcom Waterway, bulkheads are a common feature in the intertidal zone. Most extend from above mean higher high water to the structure design depth (varies from mean lower low water to depths greater than 10 feet below MLLW depending on the required water depth at the face of the bulkhead). Bulkheads are often installed in conjunction with armored slopes below the toe of the bulkhead. A bulkhead yields a habitat with no depth variability and no horizontal surfaces to support primary production, secondary production, or processing of detritus. While sessile organisms, including barnacles and some macroalgae, can attach to the vertical bulkheads, it is not suitable for producing epibenthic prey organisms for juvenile salmon. The vertical slope also means that juvenile salmon using the top one to two meters of the water column are in much deeper water during most or all tidal cycles, depending on the bottom elevation of the bulkhead, compared to a naturally sloping nearshore area. This may increase their susceptibility to predators. Juvenile salmon use waters adjacent to bulkheads, and can forage on prey items derived from planktonic or neustonic sources. However, due to the lack of epibenthic organisms, overall prey resources are typically considered to be reduced relative to sloped habitat.

- **Armored Slopes:** Slopes armored with large stones or “riprap” are typically steep and compress the horizontal habitat profile, yielding less habitat within the desired zones for juvenile salmonids than do more gently sloped habitats. Unlike bulkheads, the resulting habitat does have surfaces to support primary productions, secondary production, and processing of detritus. Substrate size of riprap slopes differs from the fine silts or sands that would have been typical of the depositional delta area in the historic Whatcom Creek, or even more coarse gravel or cobble substrates farther from the mouth of the creek. At elevations that are exposed to regular, significant wave energy, riprap has essentially no ability to retain water or organic material on its own, except in depressions in individual pieces. Exposed rock surfaces at these elevations eventually develop sessile biological matrices, including macroalgae and invertebrates, which reduce desiccation at small scales and allows for an assemblage including mobile invertebrates. At lower elevations that do not have significant wave exposure, riprap can provide a suitable substrate for many different species of macroalgae and also provides habitat areas in its interstices for invertebrates. A common means of improving the productivity of riprap slopes is to fill the interstices of the rock with a finer material (e.g., gravel) that can increase both water and organic material retention, and increase the ability of the bulkhead slope to support an assemblage include juvenile salmon prey organisms. This method may not be appropriate in higher energy areas where substrate may not be retained at mid and higher elevations. The biological assemblages on riprap substrate are more comparable to that of a rocky nearshore area than beaches. While there are epibenthic prey available for juvenile salmon in these areas, habitat function is reduced compared to areas with smaller substrate. Juvenile salmon use waters adjacent to riprap and can forage on prey items derived from planktonic or neustonic sources as well as the limited epibenthic prey.

- **Overwater Structures:** Intertidal and shallow subtidal shading has decreased light levels underneath and around overwater structures. Shading is of primary concern because it reduces light available for photosynthesis by aquatic vegetation (Haas & Simenstad, 2002). Reduced primary productivity has implications both in terms of habitat structure and complexity (reduction or loss of aquatic vegetation), and in terms supporting productivity elsewhere in the food web, including juvenile salmon prey organisms. Several studies have also documented that shading can affect the behavior of some migrating juvenile salmonids, though significant variability was observed among individuals (WDOT, 1999a, WDOT 1999b; Battelle, 2006). Shading impacts extend beyond the structural footprint of the structure as the sun's movement across the sky over a day or season results in a larger shaded area as it is oriented in different aspects. Small structures, such as narrow piers, shade relatively less area than large or wide structures such as pier aprons. Depending on the orientation of the narrow structure, direct sunlight can reach most the shade footprint over the course of a day or season. The distance from the lighted edge to the center of the structure footprint is also relatively smaller than at a wider structure, resulting in higher levels of ambient light. In contrast with wide structures, large proportions of the shade footprint may never receive direct sunlight. Wider structures also decrease the ratio of lighted edge to shaded area, and increase the distance from the lighted edge to the center of the structure footprint. This results in less ambient light under wider structures and therefore more intense impacts associated with shading. This has implications for productivity and can reduce the habitat function of an area for juvenile salmon foraging. Nearshore habitat function may be reduced underneath and immediately adjacent to overwater structures. For juvenile salmon, this impact is relatively greater at the typically highly productive low to middle intertidal zone, although impacts on macroalgae in the shallow subtidal and salt tolerant plants in the supratidal splash zone also can affect productivity in these zones. As with bulkheads, foraging function around overwater structures may be reduced due to decreased productivity but alternative food sources (plankton, neuston) are available. Those juvenile salmon that move into deeper water to avoid overwater structures may be more susceptible to deeper water predators, but this behavior is not always the response to encountering a structure.

In summary, premium habitats minimize the presence of bulkheads, steep armored slopes and over-water structures. However, waterfront navigation needs force compromises to be made between navigation and habitat features in most waterfront industrial areas. The cleanup and redevelopment of the Whatcom Waterway and New Whatcom areas provides a unique opportunity to reevaluate required infrastructure needs and achieve gains in premium nearshore habitat while simultaneously meeting the needs of waterfront navigation and land use.

## 3.3.2 Environmental Characteristics by Site Area

Environmental characteristics of the Whatcom Waterway site area described below by site unit with a focus on fish and wildlife habitats.

### Outer Whatcom Waterway (Unit 1)

The areas of the Outer Whatcom Waterway are composed largely of deepwater aquatic areas. Shallow-water nearshore habitats in the Outer Whatcom Waterway area are limited to under-dock areas along the Bellingham Shipping Terminal. Potential habitat enhancement opportunities in these areas are limited by the infrastructure needs associated with operation of a deep draft moorage area in support the operations of the federal navigation channel (Figure 3-5).

### Inner Whatcom Waterway (Units 2 and 3)

The Inner Whatcom Waterway includes a mixture of deepwater areas, and areas of emergent shallow-water habitat. The shallow-water habitat areas at the head of the Waterway and along its sides are extremely valuable as part of migration corridors for juvenile salmonids. The preservation and enhancement of these areas was identified as a priority action under the Demonstration Pilot. However, the ability to accomplish this action is subject to balancing of habitat needs with infrastructure and navigation requirements.

During the Bellingham Demonstration Pilot, the area within Site Unit 3-A was identified as a priority location for maintenance and enhancement of premium shallow-water habitat. A former wharf structure was removed by the City as part of cleanup and restoration actions in this area. Adjusting navigation dredging dimensions to preserve the emergent tideflat area was proposed as part of the preferred alternative from the 2000 FEIS.

The reevaluation of Whatcom Waterway navigation needs and associated shoreline infrastructure requirements completed as part of the Whatcom Waterway and New Whatcom projects provides an opportunity to preserve and enhance nearshore habitat located long the sides of the Whatcom Waterway. Preliminary design concepts for how waterfront infrastructure might be integrated with the needs of a mixed-use waterfront in the Inner Whatcom Waterway are shown in Figure 1-2, Figures 3-6 and 3-7 and in Appendix E. These concepts locate navigation infrastructure offshore of premium nearshore habitat benches. The bulkheads, over-water wharves, and steep armored shorelines typical of industrial waterfront areas are minimized under these concepts. The ability to implement this type of shoreline treatment will be dependent on cleanup and land use decision-making.

## Log Pond (Unit 4)

The Bellingham Bay Work Group identified habitat enhancement opportunities within the Log Pond as a priority restoration opportunity (BBWG, 1999). Monitoring has confirmed the use of the restored area by juvenile salmonids, juvenile Dungeness crabs and other aquatic organisms and marine mammals.

Some eel grass colonization has occurred since implementation of the Interim Action. However, the colonization has been limited to date to a relatively small number established blades. A pilot program has been funded under the Bellingham Bay Demonstration Pilot to enhance natural colonization rates through seeding of the area with eel grass. This pilot test is ongoing.

There are some remaining opportunities for habitat enhancements within the Log Pond. These include potential removal of the conveyor system and remaining pilings and/or dolphins. Some areas of the Log Pond remain deeper than -4 feet MLLW, and increases to these mudline elevations could further enhance habitat quality in these areas

## Areas Offshore of ASB (Unit 5)

The Habitat Restoration Documentation Report (BBWG, 1999) documented high priority restoration opportunities are within Unit 5. The Unit 5 areas were considered valuable as salmonid migration corridors, and as potential premium nearshore aquatic habitat. Shallow water habitat could be established by raising the elevation next to the ASB, and by creating structures that would reduce wave energies and allow for eel grass colonization. To the north of the ASB, along Hilton Avenue, an eel grass bed has become established. This area has elevations generally shallower than 5 feet below MLLW, and the area is partially protected from wave energies by the ASB and by a shallow-water leading edge.

Figure 3-4 shows a conceptual design for a premium nearshore habitat bench that could be within Unit 5B to improve the habitat quality of this area. These enhancements include raising of sediment elevations to depths between 3 and 6 feet below MLLW, and providing a stone leading edge to trip incoming waves and reduce resultant wave energies in shallow-water areas. These features would largely replicate conditions already present in the eel grass flat located in the Hilton Avenue area. The figure shows the different wave energy and depth regimes both along the outside (Unit 5) and inside (Unit 8) of the ASB per preliminary design concepts developed by the Port after consultation with resource agencies and project stakeholders. Any final design for this area would be subject to additional refinement during design and permitting for site cleanup, marina development and habitat enhancement activities.

### Area Adjacent to BST (Unit 6)

Like Unit 5, the area within Unit 6 has some potential value for enhancement of nearshore habitat. However, the navigation uses within this area restrict the potential for development of significant habitat benches as described above for Unit 5.

### Starr Rock (Unit 7)

Unit 7 consists of a deepwater habitat area. The depths in this area do not allow for enhancement of shallow-water habitat uses

### ASB (Unit 8)

During the Bellingham Bay Demonstration Pilot, the potential to conduct habitat enhancement activities inside the ASB area was identified. While these uses conflict with current wastewater and cooling water treatment uses, they can be potentially integrated into future marina reuse of the facility. The preliminary design concepts developed by the Port for a future ASB marina incorporated such habitat enhancement features.

If opened to the aquatic environment, the ASB would restore 28 acres of open-water habitat. This would also develop just under 4,500 linear feet of new salmonid migration corridors. The acreage of premium nearshore aquatic habitat developed as part of marina reuse would vary depending on final design and berm configurations, with potential habitat bench areas located on the inside and/or the outside of the berm. Figures 1-2 and 3-4 show one preliminary design concept illustrating the different habitat opportunities that exist with berm reconfiguration.

# 3.4 Land Use, Navigation, and Public Shoreline Access

An overview of the land use, navigation, and public shoreline access considerations of the Whatcom Waterway site area is provided in Section 3.4.1 below. The particular considerations associated with each of the Site Units are described in Section 3.4.2.

## 3.4.1 Overview of Key Issues

Land use issues are discussed below and include both 1) regulations and plans that govern waterfront land uses, and 2) priority uses that have been identified by the local community for focusing waterfront redevelopment efforts.

### Land Use Regulations and Planning

Multiple jurisdictions govern land uses on the shoreline of Bellingham Bay near the Whatcom Waterway Site – the City of Bellingham, Whatcom County, Port of Bellingham, and the Department of Natural Resources. Through comprehensive plans and shoreline master programs, these organizations determine what activities and facilities are approved within the shoreline of their jurisdiction.

- **Bellingham Shoreline Master Program:** The City of Bellingham's Shoreline Master Program (SMP) regulates and manages uses and activities within 200 feet of the shorelines within the City. In doing so, the SMP attempts to create an appropriate balance between economic development, water quality, conservation, and public uses. The SMP manages this range of environments through the use of shoreline designations. These designations include broad goals for the area within each respective designation and actions the City will undertake to help achieve those goals. The existing SMP was adopted in 1989, and the City is presently updating it. The updated SMP will have new environmental designations, goal statements and action strategies for accomplishing those goals and a set of environmental expectations. The purpose of the updated SMP is twofold: (1) to promote the public's health, safety and welfare along the shorelines, and (2) to encourage redevelopment, increase public access, improve water quality and enhance habitat within the shoreline jurisdiction. The City and Port are working with the Bellingham community to ensure that the land use vision articulated in the Waterfront Vision and Framework Plan is reflected in the SMP update. The SMP update is expected to be completed in late 2007.

- **Bellingham Comprehensive Plan:** Bellingham Bay Comprehensive Strategy was developed by a cooperative partnership of agencies, tribes, local government, and businesses known collectively as the

Pilot Work Group. The Comprehensive Strategy was intended to provide long-term guidance to decision-makers relating to implementation of sediment cleanup, source control, and habitat restoration actions in Bellingham Bay. The Comprehensive Strategy was finalized as a Final Environmental Impact Statement in October 2000, and it preceded some of the significant land-use changes that have occurred since that time. Yet much of the work of the Pilot, especially that regarding potential habitat restoration actions, remains relevant. While the Port and City are not bound by regulation to implement these potential restoration actions, many of the habitat restoration actions that were identified in Appendix A of the 2000 FEIS as furthering Pilot goals have been either implemented, or have been carried forward as part of community land use planning efforts since 2000. These habitat goals are reflected in the Waterfront Futures Group Vision and Framework Plan, and in marine infrastructure planning for the Whatcom Waterway area. The Port, City and other Pilot Work Group members have sought ways to implement the Pilot goals in the context of changing community land use needs

- **Whatcom County Shoreline Master Program:** As with Bellingham's Shoreline Master Program (SMP), the overall goal of the Whatcom County Shoreline Master Program is to achieve rational, balanced, and responsible use of the County's irreplaceable shorelines. To achieve that goal, the program strives to promote the public health, safety, and general welfare by providing long range, comprehensive policies and effective, reasonable regulations for development and use of Whatcom County shorelines. There are seven elements in the County's shoreline program – Economic Development, Public Access, Recreation, Circulation, Shoreline Use, Conservation, and Historic-Cultural. The purpose of the designations is to provide a systematic, rational, and equitable basis upon which to guide and regulate development within specific shoreline reaches.

- **Port Planning Activities:** The Port of Bellingham is responsible to the citizens of Whatcom County for providing shipping and marine cargo facilities, general boating, and maritime industry facilities, as well as assisting in maintaining and developing a healthy regional economy. The Port's main planning tools are area Master Plans, and the Port's Comprehensive Scheme of Harbor Improvements. Over the past 10 years, the Port has led and participated in extensive land use planning activities related to Bellingham's waterfront areas. Examples of these activities include the following:

- Land use studies conducted during 1999 and 2000 for the Central Waterfront area.
- Master Planning efforts for the Bellingham Shipping terminal and vicinity, also completed in 1999 and 2000.
- Alternatives evaluations for siting of new marina facilities to meet regional moorage demand.
- Outreach activities conducted by the Port of Bellingham as part of the GP due diligence process during 2004, including soliciting of extensive stakeholder and public input on potential waterfront cleanup actions, land use alternatives, and navigation priorities for the Whatcom Waterway.
- Amendment to the Port Comprehensive Scheme of Harbor Improvements identifying the need for future aquatic use of the ASB area for marina development.
- Ongoing Port and City leadership land use planning efforts for the redevelopment of the New Whatcom area, including pending development of a final area Master Plan for the "New Whatcom" area of Bellingham's Waterfront. The Master Planning process will include SEPA environmental review of the Master Plan elements.

- **Port Management Agreement (Port and DNR):** The Port of Bellingham and DNR entered into a cooperative agreement in September 1997 to allow the Port to manage certain state-owned aquatic lands through a Port Management Agreement (PMA) (RCW 79.90.475). The Port is responsible for managing the aquatic lands covered under the PMA consistent with federal and state regulations and laws, and DNR's aquatic land management goals of fostering water-dependent uses, ensuring environmental protection, encouraging public use and access, promoting production on a continuing basis of renewable resources, and generating income from the use of aquatic lands consistent with the goals. Parcel 3 of the current PMA includes portions of the Bellingham Shipping Terminal, and adjacent aquatic lands near the barge dock area.

- **State-Owned Aquatic Lands (DNR):** State-owned aquatic lands in Bellingham Bay include bedlands, tidelands, filled tidelands, designated Harbor Areas, and state waterways. State regulations guide the use and management of these lands. Bedlands are those lands lying waterward of the extreme low tide mark, or the outer harbor line. Harbor areas are the areas located between the inner and outer harbor lines. The Bellingham Harbor Areas were originally established by the state of Washington as two separate harbor areas – New Whatcom and Fairhaven – on September 1, 1891. Currently, state-owned aquatic lands include the three Bellingham waterways (Whatcom Waterway, I&J Street Waterway and Squalicum Waterway). The Port of Bellingham and DNR have signed a Memorandum of Understanding (Appendix C) committing to update harbor area and waterway designations as part of the ongoing land use planning process.

## Waterfront Land Use Priorities

Waterfront land use priorities in the Whatcom Waterway site area have historically been characterized by a focus on water-dependent industrial uses like those formerly located at the Georgia Pacific mill site and the Bellingham Shipping Terminal. However, the Bellingham waterfront has undergone a series of unprecedented land use changes. The community's land use priorities for waterfront areas, particularly those in the Inner Whatcom Waterway, are best reflected in the Vision and Framework Plan of the Waterfront Futures Group (Appendix B). Key elements of that plan for the areas of the Whatcom Water site (described in the Vision and Framework Plan as the City Center area) include the following:

- Develop a mixed-use waterfront neighborhood including new job opportunities and urban housing.
- Complete the cleanup and opening of the ASB to accommodate either a new marina or new marine habitat combined with stormwater treatment or some combination of those uses.
- Maintain deepwater moorage in the Whatcom Waterway, consistent with other uses and preservation of critical habitat areas.
- Reinforce the Inherent Qualities of Each Place on the Waterfront including integration of water-dependent uses with new commercial, institutional, educational, and residential uses and public spaces.
- Restore the Health of Land and Water including enhancement of natural systems, tailoring of cleanup strategies and remediation to planned uses, and restoration and enhancement of beaches wherever possible.
- Improve Waterfront Access including connections between uplands and waterfront areas and links to regional trail systems, while respecting natural habitat.
- Encourage and promote fisheries and ocean-related research industrial and facilities.

- Promote a health and Dynamic Waterfront Economy including mixed-use redevelopment of the former Georgia Pacific Mill site and the uplands area adjacent to the Cornwall Avenue Landfill site.
- Provide transient moorage in the Inner Whatcom Waterway, while avoiding impacts to critical habitat in this area
- Provide hand-carry boat landing opportunities within the project area, including at the Cornwall Avenue Landfill and near the ASB.
- Enhance the system of connected public open spaces between the Whatcom Waterway and the south end of the Cornwall Avenue Landfill, including open spaces along the waterfront and completion of the over-water walkway between the Cornwall Avenue Landfill and Boulevard Park.

These land use priorities require a more complex, balanced approach than the historical “industrial only” approach to the Bellingham Waterfront.

## Navigation Priorities

The Port of Bellingham is and has historically been the local sponsor responsible for working with the U.S. Army Corps of Engineers on the development and maintenance of federal navigation channels. Currently, the Whatcom, I&J, and Squalicum waterways are federally-authorized channels for navigation and commerce. The Whatcom Waterway was initially authorized for dredging by the River and Harbors Act of June 15, 1910. Public Law 86-645, Section 7 (May 5, 1965) first authorized the I&J Waterway. The dimensions of both channels have been modified through time.

The Port of Bellingham operates a marine shipping facility at the Bellingham Shipping Terminal (BST). The main products historically handled at the terminal included wood pulp and aluminum ingots, automobiles, powdered milk, logs and other cargo. A Burlington Northern-Santa Fe main line runs adjacent to the BST. A rail spur runs from the terminal to the main line; a rail barge transfer span is on site. The Burlington Northern-Santa Fe main line connects with Canada’s Canadian National, Canadian Pacific, and BC Rail lines.

Deep-draft vessels approaching Bellingham Bay from the north use the channel between Lummi and Sinclair Islands. Vessels approaching from the south generally use the Bellingham Channel that leads eastward from Rosario Straight. Shallow-draft vessels proceeding to Bellingham from the south frequently use Swinomish Channel and Padilla Bay, and from the north, Hale Passage. Two federally designated anchorage areas have been established in the Bay, outside of the Whatcom Waterway site area. The bottom of these areas consists of a thin accumulation of mud over hardpan forming rather poor holding ground in heavy weather. General Anchorage has a circular radius of

2,000 yards, and Explosives Anchorage has a circular radius of 1,000 yards (Navigation Data Center 1998).

The Port of Bellingham conducted an assessment of the three waterways in 1998 (BST Associates 1998). This assessment examined the changes to the shipping fleet over the past twenty to thirty years. The study documented changes in cargo shipping practices, including a trend of increasing draft for cargo vessels. The drafts common for vessels calling on Ports in the Pacific Northwest was between 37 and more than 45 feet. The depths and widths of the Whatcom Waterway are not sufficient, particularly the narrow constraints of the Inner Whatcom Waterway, to accommodate cargo shipping given the demands of the shipping industry. Specific navigation priorities for the Outer Whatcom Waterway and Inner Whatcom Waterway areas are described in Section 3.4.2 below.

The development of a combined marina, aquatic habitat, and public shoreline access uses in the ASB area is an element of the Port's planning for the Whatcom Waterway area. These uses are consistent with the Vision and Framework Plan of the Waterfront Futures Group (Appendix B) and are carried forward as part of the New Whatcom Master Plan process (Appendix E). The concept for the ASB area is described below in section 3.4.2.

## Recreation and Public Shoreline Access

Enhancing waterfront recreation and shoreline access opportunities has been a key element of the Waterfront Futures Group work and of supplemental land use planning activities. Significant information on these opportunities is described below:

- **Bellingham Parks**: A variety of parks are found in the area, including 23 neighborhood parks, 8 community parks, 18 special use areas and 24 natural open space areas owned by the State, County, Port, Bellingham School District and City (Bellingham 1995). Some of the larger parks along the shoreline include Little Squalicum Park, Maritime Heritage Center Park, Boulevard Park, and the Port of Bellingham Marine Park. A few non-motorized trails exist along the shoreline, however, the City Parks and Recreation Department's Open Space, Parks, and Recreation Plan indicates the number of trail miles available to the local population is a slightly below the recommended standard. Accordingly, the Parks and Recreation Department is interested in adding to their existing trail system. Potential trail corridors have been identified by the City along the entire shoreline of the inner bay. New parks, open space and trail areas are being incorporated into the planning for the New Whatcom area.

- **Public Shoreline Access:** Enhancing public shoreline access in waterfront areas is a key priority of the New Whatcom planning effort. This is particularly true for the Inner Whatcom Waterway where public shoreline access has been historically restricted by navigation and industrial use activities. Enhancement of public shoreline access was also a key priority in the preliminary design concepts developed by the Port for a new marina for the ASB area.

- **Shellfish Harvesting:** Within Bellingham Bay there are two tribal groups with fishing rights: the Lummi Nation and Nooksack Tribe. They use and enjoy a variety of fisheries resources from Bellingham Bay and surrounding streams and rivers for subsistence, ceremonial, and commercial purposes. These resources include a wide variety of salmon, other fish, crab, and clams, which have varying harvest times. Major tribal shellfish areas are found in and around Portage Bay and Portage Island, and along the Lummi Peninsula. Primary species harvested by the Lummi Nation include Pacific oysters, native littleneck clams, and Manila clams. Clam harvests, primarily from the Lummi Nation, have increased considerably over the past 25 years. Crab landings have remained stable over the past 25 years, at an annual baywide harvest of approximately 233,000 pounds per year (tribal and commercial landings). The only commercial shellfish harvesting area in Bellingham Bay is the Portage Island area.

- **Salmon Fisheries:** Tribal and non-tribal commercial salmon fishing occurs throughout Bellingham Bay. Sport fishing is generally restricted to an area south of Post Point to Chuckanut Bay and off Governors Point. The most lucrative fisheries in Bellingham Bay are the chinook, coho, and chum salmon. Although there are no targeted fisheries for pink and sockeye salmon, these species are incidentally caught in the Bay. Sockeye salmon are also caught incidentally in the Nooksack River fisheries. Over the past 15 years, salmon have represented the largest portion of total catch from Bellingham Bay. Many of the habitat restoration priorities for Bellingham Bay have focused on the preservation and enhancement of critical habitats for salmon, consistent with the social and cultural importance of the salmon fisheries and the troubled condition of many of the salmon stocks.

- **Groundfish Fisheries:** Several groundfish species occur in Bellingham Bay. These species are used by the Tribes and are harvested by other users of the Bay, and are considered to be economically and ecologically important. These species include but are not limited to Pacific cod, Rockfish, Lingcod, Rock Sole, English sole, and Starry flounder. Except for inner Bellingham Bay, the entire bottom of the Bay is considered part of the recreational fishery for marine fisheries resources (CH2M Hill 1984). Commercial fishing for these species occurs primarily in the deeper water of the central part of the Bay. Prior to about 1984, there was a relatively large herring fishery. However, declines in the length and age of fish were observed by WDFW in 1980. These data, along with uncertainties regarding the origin of local stock, prompted closure of the fishery in 1984.

## 3.4.2 Land Use, Navigation, and Shoreline Issues by Site Area

Land use, navigation and shoreline public access issues are summarized below by geographic area, using the Site Unit designations shown in Figure 1-1.

### Outer Whatcom Waterway (Unit 1)

Navigation uses in the Outer Whatcom Waterway offshore of the Bellingham Shipping Terminal are largely transitory, with vessels coming into and traveling out of the Waterway. Vessels are generally not anchored in these areas, and there are no permanent dock structures or mooring dolphins.

A federal navigation channel is located in the Outer Whatcom Waterway. Federal navigation channels represent a conditional agreement between the Corps of Engineers and a local entity (the “local sponsor,” in this case the Port of Bellingham) under which the federal government shares the cost and assists with the implementation of certain defined navigation maintenance activities. The limits of the federal commitment are defined geographically by the dimensions of the “project.” For the Outer Whatcom Waterway, the project depth is defined as 30 feet below mean lower low water (MLLW) and the width varies from 263 feet near the Shipping Terminal to 363 feet in offshore areas.

Under the federal channel maintenance program, the local sponsor can request the Corps to maintain the project depths by periodic maintenance dredging. Subject to federal funds availability, the Corps conducts such dredging under its Operations and Maintenance program. The federal participation is subject to a navigation needs analysis that must show that the dredging is in the national economic interest. This needs analysis considers industrial and commercial navigation uses (e.g., cargo operations, commercial fishing, institutional users) but does not consider recreational, public access, or habitat uses.

If maintenance dredging is performed by the Corps in a federal channel, the local sponsor must provide for sediment disposal, and must share certain other costs. The sponsor is responsible for coordinating the costs of development and maintenance of “berth” areas and shoreline infrastructure with local property owners and other interests. The berth areas are the areas located along-side the federal channel that are used for mooring of vessels. In order for the water depth of a federal channel to be usable, the depths in berth areas must be consistent with those in the channel. Otherwise a vessel traveling in the channel would not be able to moor along-side a wharf.

Figure 3-5 illustrates the essential characteristics of the federal channel and berth areas applicable to Unit 1C of the Outer Whatcom Waterway. The current water depths in the Outer Whatcom Waterway are at or slightly below the "project depth" of 30 feet in the federal channel areas. The federal channel boundaries are offset from the wharf areas by approximately 50 feet. This "berth" area is defined along the inshore edge by the "pierhead line" and along the offshore edge by the federal channel boundary. Depths in this area are maintained by local interests. Construction is generally prohibited in areas offshore of the pierhead line, and is regulated by the Corps of Engineers and the Coast Guard. The pierhead line runs along the face of the docks at the Bellingham Shipping Terminal.

As shown in Figure 3-5, the maintenance of water depths in the berth areas of the Shipping Terminal requires maintenance of substantial shoreline infrastructure. That infrastructure includes bulkheads, engineered armored slopes, and over-water wharves that provide for mooring and loading/unloading of vessels moored at the berths. In order to meet the economic needs test of the Corps of Engineers maintenance dredging program, upland land uses have been restricted and are designated in the Shipping Terminal area for appropriate water-dependent uses, consistent with the federal channel designation.

The Bellingham Shipping Terminal has been used since the early 1900s for cargo shipping and warehousing activities. Multiple future uses have been considered as part of the evaluation of land use changes in the New Whatcom planning area (Appendix E). The Shipping Terminal areas are currently anticipated to continue in water dependent uses. Potential future uses include operation of appropriate institutional users (e.g., Coast Guard or NOAA), limited cargo shipping, or other deep draft navigation uses.

The Port recently completed a review of navigation and infrastructure requirements associated with the Whatcom Waterway. As discussed in Port Resolution 1230 (Appendix F) it is anticipated that the federal channel will be maintained in the Outer Whatcom Waterway areas consistent with its current dimensions. The shoreline infrastructure required for operation of a shipping terminal is present in this area, though significant maintenance and potential upgrades may be required prior to resumption of deep draft uses.

Shallow-water nearshore habitats in the Outer Whatcom Waterway area are limited to under-dock areas along the Bellingham Shipping Terminal. Potential habitat restoration enhancement opportunities in these areas are limited by the infrastructure needs associated with operation of a deep draft moorage area in support the operations of the federal navigation channel. The

Bellingham Bay Comprehensive Strategy reflects this and has no specific restoration recommendations for this area.

## Inner Whatcom Waterway (Units 2 and 3)

Like the Outer Whatcom Waterway, the Inner Whatcom Waterway has historically been used for industrial water-dependent uses. These have included operation of lumber mills, the GP pulp and paper mill, gravel shipping, fish processing and bulk petroleum terminal operations. The federal navigation channel was initially established in the early 1900s with project depths of 18 feet below MLLW (Inner Whatcom Waterway) and 26 feet (Outer Whatcom Waterway). This deeper portion of the channel was expanded between 1958 and 1961. Most of the Central Waterfront area was developed when the project depth was 18 feet below MLLW.

The federal project boundaries prohibit Corps dredging within 50 feet of the pierhead lines and structures. This limits the effective water depth in this area due to the lack of supporting berth area depths and requisite shoreline infrastructure. The width of the Waterway is constrained by developed fill areas and upland features adjacent to the Waterway.

Effective water depths in the Inner Whatcom Waterway are currently limited by the restrictions of the federal navigation channel to the depths at the pierhead line. These depths range from less than zero in some shoaled areas to as much as 22 feet in outer portions of the GP dock. In areas offshore of the Log Pond, the water depths are usable only for transit (i.e., vessels entering or leaving the Inner Whatcom Waterway), because no shoreline land areas or over-water infrastructure exists in these areas.

The land use restrictions associated with the historic federal channel boundaries are in conflict with both current and planned uses of the Inner Whatcom Waterway as a result the Port has initiated consultations with the Department of Natural Resources, the Corps, and other parties to update channel designations. The historically industrial, water-dependent uses of shoreline properties are undergoing a transition to mixed-use redevelopment. The area zoning has been updated to mixed-use, and the area is undergoing a Master Plan development effort (Appendix E). The Master Planning effort is grounded in the principles of the Waterfront Futures Group (Appendix B), a community-based planning process that identified land use priorities for the waterfront areas.

During 2005 the Port and DNR signed a Memorandum of Understanding (Appendix C) which included a proposal to update harbor area and Whatcom Waterway channel dimensions. The objective is to provide for a range of uses within the Inner Whatcom Waterway consistent with local land and navigation uses. The Inner Whatcom Waterway would be managed by local interests as a Multi-Purpose Waterway, providing a wider range of uses than those supported by the current federal channel designations.

In addition, in May 2006 the Port Commission, after public comment, issued Resolution 1230 (Appendix F) which requests that the U.S. Congress de-authorize the Inner Whatcom Waterway from head of the federal channel at the Roeder Avenue Bridge to Bellingham Shipping Terminal, in order to allow implementation of a Multi-Purpose Waterway, and to focus federal funding participation on the deep draft terminal areas of the Outer Whatcom Waterway. Language proposing the modifications to the federal channel has been drafted and included in congressional legislation that is expected to be finalized during 2006.

As shown in Figure 3-6 and Figure 3-7, the Locally-Managed Multi-Purpose Channel concept provides for shoreline public access. Navigation depths would be appropriate to the channel widths and shoreline infrastructure, and would range between 18 to 22 feet below MLLW. Portions of the waterway at the head of the channel (Unit 3-A) would likely be preserved as premium shallow-water habitat. Sideslopes in berth areas along the sides of the waterway would be enhanced to support navigation uses in the waterway, and also to develop additional shallow-water habitat areas, particularly in intertidal and shallow subtidal elevations. Navigation infrastructure would likely include floats and access gangways, rather than industrial wharves and bulkheads which decrease achievable habitat benefits.

Unit 2-B has been identified during Port marina planning as the preferred location for an access channel between the ASB and the Whatcom Waterway. The use of Unit 2-B minimizes the potential disruption of nearshore habitat. Alternate access channel locations have been evaluated, but these locations result in greater disruption of existing nearshore habitat, and greater limitations on potential future habitat enhancements. The use of the Unit 2-B location for the access channel is partly contingent on navigation planning for the Inner Whatcom Waterway. If deep draft navigation uses are conducted within the Inner Waterway, this may result in navigation conflicts that would force use of an alternate channel location as shown in some of the older marina design concepts (refer to Figure 3-7 and Figure 1-3).

The RI/FS study and this FSEIS analyze a range of uses and associated dredging patterns for the Inner Whatcom Waterway areas, including both heavy industrial uses dominated by the federal channel, and the current mixed-use requirements as articulated in the principles of the Waterfront Futures Group and local planning activities. Obtaining consistency between Waterway cleanup activities in the Inner Whatcom Waterway and area land use and navigation priorities is specifically evaluated as part of remedial alternatives analysis in the RI/FS and in this FSEIS.

## Log Pond (Unit 4)

As its name implies, the Log Pond was historically used as a log pond for lumber and pulp mill operations. These uses have been discontinued since the completion of the Log Pond Interim Remedial Action in 2000/2001.

The Log Pond has been designated for cleanup and habitat restoration uses. Some public access enhancements to upland shoreline areas are likely as part of future redevelopment of the former GP Mill site. These uses would likely include development of a shoreline promenade along portions of the Log Pond. No in-water navigation uses are contemplated for the Log Pond.

## Areas Offshore of ASB (Unit 5)

The shoulder areas of the ASB were historically used for log rafting, prior to construction of the ASB. Future navigation use of these areas is considered limited by water depths and the lack of available upland adjacent to these areas.

The Port plans to develop an environmentally sustainable marina within the ASB. The marina has been included in the Port's Comprehensive Scheme of Harbor Improvements. However, navigation features within Unit 5 are not contemplated due to anticipated conflicts between such uses and habitat preservation and enhancement objectives. The priority uses within Unit 5 are those associated with habitat enhancement opportunities. The priority uses within Unit 5 are those associated with habitat enhancement opportunities. The potential location for development of a new premium nearshore habitat bench is shown in Figure 1-2.

The modification of this area to construct nearshore habitat benches along this portion of the shoreline was considered as part of the 2000 Comprehensive Strategy EIS, and has been incorporated into design concepts for the ASB marina.

## Area Adjacent to BST (Unit 6)

Navigation uses in the Barge Dock area have historically included log rafting, barge traffic, and tug boat mooring. Some propeller wash effects may be significant in this area, depending assuming future barge and tug uses.

Two docks are located within this area including the barge dock and the former GP Chemical dock. The northern side of the Barge Dock area is bounded by the back side of the Bellingham Shipping Terminal wharf structure.

Some dredging activities have historically been performed in the Barge Dock area, including dredging for establishment of cargo terminal berth areas, as well as dredging to obtain fill material for use in development of a portion of the Bellingham Shipping Terminal. Regular maintenance dredging such as that considered for the Whatcom Waterway areas is not expected. As described above for the Outer Whatcom Waterway, the Bellingham Shipping Terminal is anticipated remain under industrial water-dependent use, including potential reuse by institutional users and cargo operations.

## Starr Rock (Unit 7)

Historic navigation uses in the Starr Rock area were limited to Log rafting. These uses were discontinued in the 1970s with the development of Boulevard Park nearby. Future navigation uses in the Starr Rock area are not anticipated other than transit uses by recreational vessels. Deepwater navigation is restricted in this area due to the proximity of the natural shallow-water obstruction at Starr Rock, and by the lack of adjacent upland navigation support facilities.

## ASB (Unit 8)

The ASB facility was constructed by Georgia Pacific for treatment of wastewater and stormwater. It also provides cooling water management for the Encogen energy production facility. These uses are expected to continue through June of 2008, consistent with Port-GP agreements. After that time these uses are likely to be discontinued.

The Bellingham Bay Comprehensive Strategy included a recommendation for removal of the ASB in order to establish intertidal and shallow sub-tidal habitat. However, no funding mechanisms have been identified to implement this type of project, and alternative uses of the ASB have formed the basis of recent land use planning efforts.

During 2004, the ASB was identified by the Port as the preferred site in Bellingham Bay for construction of a new marina facility (Makers, 2004). The preference for the site was based on several factors, including the ability to develop a marina with net gains in both habitat and public access opportunities. Preliminary design concepts for a marina incorporating public access and habitat enhancements were developed by the Port after consultation with resource agencies and project stakeholders. One of these design concepts is presented in the current Feasibility Study and in the FSEIS. The design concept incorporates development of intertidal and shallow sub-tidal habitat, consistent with the general intent of the Bellingham Bay Comprehensive Strategy recommendation. If completed according to that design concept, the ASB marina would reconnect the 28-acre ASB area to Bellingham Bay, and restore nearly 4,500 linear feet of salmonid migration corridors. The acreage of premium nearshore aquatic habitat developed as part of marina reuse would vary depending on final design and berm configurations, with potential habitat bench areas located on the inside and the outside of the berm.

Figures 3-4 and 3-7 and the illustrations contained in Appendix E illustrate some of the changes that have been contemplated for the ASB berm structure as part of marina reuse. These changes assume that Waterway cleanup activities remove the ASB sludges from the site. The clean berm materials can then be partially removed from the area for reuse in cleanup and habitat enhancement activities. The berms would be modified to reduce overall height and width consistent with marina breakwater requirements. Public access amenities may be included in the berm, potentially including a shoreline promenade, landscape features and other enhancements. Habitat enhancements may be included in the berm including nearshore habitat benches on either the inner or outer areas of the berm. Figures 1-2 and 3-7 and the illustrations in Appendix E show the marina design concepts in plan view. Marina facilities would be located in deepwater areas inside the ASB area. The final design will depend on optimization of navigation, public access and habitat uses and will be developed in future design and permitting for area reuse.

The Port updated its Comprehensive Scheme of Harbor Improvements in 2004 to reflect the future planned use of the ASB for marina development. The Port further developed a funding plan to conduct the cleanup of the ASB and the development of the marina project. The majority of the ASB was acquired by the Port as part of the 2005 GP property transaction. The City has supported the marina development concept as documented in the July 2006 Interlocal Agreement between the Port and the City (Appendix E). Development of a marina in the ASB, and the final design of any such marina, is subject to additional design and permitting evaluations.

The City also evaluated the ASB for potential future stormwater or wastewater treatment uses, but it determined that it is not well suited for these uses due to its location, elevation, and the operational characteristics of the current GP-owned outfall structure.

# 3.5 Air and Noise

An overview of air quality and noise issues and how they are regulated within the Whatcom Waterway site and vicinity is provided in Section 3.5.1 below. Specific considerations applicable to the different site areas are described in Section 3.5.2.

## 3.5.1 Overview of Key Issues

### Air Quality

Air quality in the Bellingham Bay study area is regulated by EPA, Ecology and the Northwest Air Pollution Authority (NWAPA). Each agency has its own role in regulating air pollution. NWAPA has local authority for regulation and permitting of stationary sources and construction emissions. Ecology regulates mobile sources. The EPA sets national standards and has oversight authority over NWAPA and Ecology.

Under the 1970 Clean Air Act, EPA established air quality standards for six pollutants. These standards, known as National Ambient Air Quality Standards (NAAQS) specify maximum allowable concentrations over varying time periods. For regional air quality to remain in attainment with these standards, they cannot be exceeded more than a given number of times per year over a given time period. The major airborne pollutants of concern controlled by the NAAQS include the following:

- Particulate Matter ($PM_{10}$)
- Particulate Matter ($PM_{2.5}$)
- Lead (Pb)
- Sulfur dioxide ($SO_2$)
- Carbon monoxide (CO)
- Ozone ($O_3$)
- Nitrogen Dioxide ($NO_2$).

Under the Clean Air Act, EPA develops two standards for each pollutant of concern – a primary standard for protection of public health, and a secondary standard for protection of public welfare. Public welfare includes effects on soils, water, crops, vegetation, buildings, property, animals, wildlife, weather, visibility, transportation and other economic values, as well as personal comfort and well-being.

## Existing Air Conditions

Primary source of pollutants in the Bellingham Bay area are automobile traffic, marine activities and industrial activities. Fueling and operation of gasoline-powered automobiles and boats generate CO. However, periodic monitoring of CO levels indicates that levels are low and this pollutant is not present a concern in the study area (Keel 1999).

The GP pulp and paper mill was the primary industrial source of air pollutants in the study area. Emissions from the mill have decreased substantially since closure of the pulp and chemical operations. Other nearby industrial sources of air pollutants include the Intalco Aluminum plant, the Conoco Phillips oil refinery and the BP oil refinery. Sulfur dioxide emissions are monitored at all of these industrial facilities. Within NWAPA's jurisdiction, most of the industrial emissions of $SO_2$ come from petroleum refining and aluminum production operations. Ambient $SO_2$ levels in the Bellingham Bay area have been within the allowable standards set forth by EPA.

Ground-level ozone is a key ingredient of urban smog, formed by the reaction of gases (nitrous oxides and hydrocarbons) in the presence of heat and sunlight. These gases are emitted from combustion sources such as motor vehicles and power plants. Ozone concentrations are measured on a regional basis and are monitored by NWAPA. In general, the prevailing winds common to Bellingham Bay help to keep ozone concentrations within EPA standards.

The three pollutants most likely to be of concern in Bellingham Bay are sulfur dioxide ($SO_2$), particulate matter and ozone (Keel, 1999). NWAPA operates several air quality monitoring stations within its jurisdiction. Additional stations at industrial facilities monitor concentrations of $SO_2$, $PM_{10}$ and ozone. Monitoring results show that air quality in Bellingham Bay is good and is currently in attainment with all air quality pollutant criteria.

## Noise

The unit used to measure noise is the decibel (dB). A weighted decibel scale (dBA) was developed to approximate the sensitivity of the human ear to sounds of different frequencies. The dBA scale is used in most noise ordinances and standards. Decibles are measured logarithmically. An increase of 10 decibels means that the sound is 10 times as loud. Thus, 80 dB is 10 times louder than 70 dB, and 90dB is 100 times louder than 70 dB. For reference, light traffic generates a decibel rating of 50dB, while truck traffic rates around 90dB.

Washington State noise standards (WAC 173-60-040) identify the maximum permissible noise levels for three classes of land use:

- **Class A:** Residential, multi-family, recreational and entertainment (parks, camping facilities, resorts), and community service facilities (hospitals, correctional facilities).
- **Class B:** Commercial and retail uses, banks, office buildings, recreational and entertainment (theaters, stadiums, fairgrounds), community service facilities (schools, churches, government and cultural facilities).
- **Class C:** Industrial, agricultural, storage and distribution facilities.

The zoning or land use of both the source of noise and the receiving property are considered in the state noise standards. Sounds originating from temporary construction sites as a result of construction activity are exempt from the state rules, except for the provisions of Class A properties between 10 p.m. and 7 a.m.

The City of Bellingham municipal code includes a section on Public Disturbance Noise (10.24.120). This section provides general description of sounds that are considered a public disturbance, without establishing minimum standards or specifying decibel levels. For example, construction and industrial noise in residential areas, between the hours of 10 p.m. and 7 a.m. is considered unlawful. This is consistent with the Washington State noise limitations. In the absence of a specific local noise ordinance in Bellingham, the Washington State limitations apply within City limits.

## Existing Noise Conditions

Land uses around Bellingham Bay are a mixture of open space, residential communities, and marine/industrial operations. Noise in the study area is caused by airplanes, vehicular traffic, ferries, trains and commercial/industrial activities. Sensitive noise receptors (Class A land uses) include residential communities along the north side of the Bay and in the South Hill and Fairhaven neighborhoods on the south side of the bay. Several parks along the bay are also considered sensitive receptors, including Maritime Heritage Center Park and Boulevard Park. The planned development of additional parks and open space areas will increase the number of sensitive noise receptors along the Bay.

## 3.5.2 Air and Noise Issues by Site Area

Air quality and noise impacts will be associated with cleanup construction activities. However, these impacts will be mitigated through the use of appropriate equipment and work hours, to be specified during project design and permitting. Project air quality and noise issues vary less by project area than do other environmental factors evaluated in this FSEIS. However, potential variation of noise considerations by project area includes the following:

- **Outer Whatcom Waterway (Unit 1):** No sensitive noise receptors are currently located adjacent to Unit 1.

- **Inner Whatcom Waterway (Units 2 and 3):** Sensitive noise receptors located near the Inner Whatcom Waterway currently include Maritime Heritage Park. As the redevelopment of the New Whatcom area proceeds, additional Class A or Class B areas may be established. This could impact project noise control requirements.

- **Log Pond (Unit 4):** No sensitive noise receptors are currently located adjacent to Unit 4. As the redevelopment of the New Whatcom area proceeds, additional Class A or Class B areas may be established, including mixed use redevelopment of portions of the former GP mill site. This could impact project noise control requirements.

- **Areas Offshore of ASB (Unit 5):** No sensitive noise receptors are currently located adjacent to Unit 5. As the redevelopment of the New Whatcom area proceeds, additional Class A or Class B areas may be established, including potentially new park areas along the perimeter of the ASB. This could impact project noise control requirements.

- **Areas Adjacent to BST (Unit 6):** No sensitive noise receptors are currently located adjacent to Unit 6. As the redevelopment of the New Whatcom area proceeds, additional Class A or Class B areas may be established, including potentially new mixed-use development and/or park areas along the perimeter of the RG

Haley and Cornwall Avenue Landfill sites. This could impact project noise control requirements.

- **Starr Rock (Unit 7):** Boulevard Park is considered a sensitive noise receptor and is located near Unit 7.
- **ASB (Unit 8):** No sensitive noise receptors are currently located adjacent to Unit 8.

# 3.6 Cultural Resources

Cultural and historical resource review will be addressed during subsequent design and permitting reviews for the project. However, an overview of previous studies and their findings is provided in Section 3.6.1 below. The findings relevant to each of the Site Units are described in Section 3.6.2.

## 3.6.1 Overview of Key Issues

The project area is part of an active marine shoreline that has undergone many changes since the glaciers retreated from the area approximately 8,000 years ago. Sea level fluctuations associated with glacial retreat and sea level rise submerged parts of the Bellingham Bay shoreline that may have been exposed and habitable at approximately 5,000 years ago. The level did not stabilize to the current level until approximately 2,250 years ago (Williams and Roberts 1989). Sand spits and small embayments or coves such as those found on Portage Island and in the Fairhaven area may contain submerged archaeological sites that were inundated over time by the rising sea level. The identification of shell midden sites along the shore of Bellingham Bay from Portage Island to Chuckanut Bay reveals the likelihood for hunter-fisher-gatherer deposits.

### Previous Cultural Resource Studies

During the 2000 FEIS development, a review of existing literature was conducted to provide an overview of cultural resources in the project area. This review was conducted to determine the probability for hunter-fisher-gatherer and historic archaeological resources, and historic structures within or adjacent to the project area that are listed in the National Register of Historic Places (NRHP), or are eligible for listing in the NRHP. The review included consultation with state and county agencies responsible for maintaining inventories of archaeological sites, including shipwrecks and historic structures, to locate recorded sites and structures within or adjacent to the project area, and to determine their evaluation status. Background ethnographic and historic information was acquired through review of ethnographies, local histories, previous cultural resource studies, historic maps, and geologic and soil surveys.

Cultural resource investigations in and near the project area vicinity have included overviews, field surveys, and testing projects (Bellingham Bay

Demonstration Pilot Project, Whatcom County Cultural Resources Overview Report, LAAS, 1999). An additional review of archaeological and cultural resources was completed during remediation of the Holly Street Landfill site in 2004, including on-site archaeological monitoring during all excavation work at that site.

Twenty-four hunter-fisher-gatherer archaeological sites along the shore of Bellingham Bay have been identified during previous cultural resource studies and archaeological investigations in the project area vicinity.

## Tribal Consultation

The Whatcom Waterway site is within the territory of the Nooksack and Lummi tribes. Territorial divisions were described by Suttles (1951), who placed Lummi territory within the San Juan Islands and along the mainland shoreline from Point Whitehorn to Chuckanut Bay. Nooksack territory extended inland along the Nooksack River basin as far south as Lake Whatcom (Suttles 1951). European explorers arriving in the area in the late eighteenth century, however, encountered both tribes in the project area (Salo 1993).

The Lummi Nation and Nooksack Tribe were contacted as part of the development of the 2000 FEIS and asked for information pertinent to the project area. Harlan James, a member of the Lummi Nation, stated that Bellingham Bay was good fish habitat and that "fish are culture and culture is fish." He emphasized that the entire west side of Bellingham Bay and the mouth of the river are culturally important to the tribe. Other parts of Bellingham Bay were taken from the Lummi Nation through their exclusion from the reservation. Mr. James specifically noted that a Lummi canoe landing area in the Old Town district near the mouth of Whatcom Creek has been filled but that it is culturally important to the Lummi people. He also stated that they fished the entire Bay and that Lummi elders remember octopi, sole, and other fish in Bellingham Bay that are no longer available. These marine resources were different than those outside Bellingham Bay. Mr. James concluded that the entire Bay was of cultural significance to the Lummi Nation.

## Hunter-Fisher-Gatherer Archaeological Sites

Bellingham Bay provided a wide variety of marine and terrestrial resources that were collected by hunter-fisher-gatherers of the area and processed at seasonal and long-term camps along the shore of the Bay. Hunter-fisher-gatherer deposits within these areas would be associated with fishing, seasonal and long-term camp occupations, shellfish and salmon processing, and terrestrial resource collecting and processing. Out of the 24 hunter-fisher-gatherer archaeological sites recorded in the project area, 17 are shell middens, six are lithic scatters, and one is a possible petroglyph. All the sites are on sand spits, along beach terraces and embayments, or on bluffs or ridges overlooking Bellingham Bay. Shell midden and lithic sites recorded in the project area vary in size and integrity. Cultural deposits identified at shell midden sites consist of whole and fragmented shell, fire modified rock, bone and stone tools, and faunal remains. Cobble choppers, cores, fire modified rock, scrapers and utilized flakes were identified at the lithic sites.

Historic development in the project area has most likely adversely affected hunter-fisher-gatherer shell midden deposits and lithic sites. A possibility does exist, however, that submerged sites or intact subsurface deposits could be present under fill deposits at the mouth of Whatcom Creek. Other areas of the Bay also have a lower probability of occurrence, limited to potential submerged prehistoric sites at the paleoshorelines of the major drainages covered by sea level rise in the last 8,000 years. Intact deposits are not expected in areas subject to previous dredging and fill activity.

Of the 24 hunter-fisher-gatherer archaeological sites identified within the project area, only one has been evaluated for significance (45WH111). The site is on the southern tip of the Lummi Peninsula at Portage Point and was tested by Grabert and Griffin (1983) as part of mitigation measures related to the construction of 31 miles of sewer pipeline through the Lummi Reservation. The site contained archaeological deposits that could provide information important to regional prehistory. Grabert (1983) recommended that the site be nominated for inclusion in the National Register of Historic Places. This area would not be affected by any of the project alternatives.

## Historic Archaeological Sites

Historic archaeological resources may be present in the project area primarily within the area surrounding former Citizen's Dock. Archaeological deposits associated with early industry in the Bellingham area such as the Roeder-Peabody Mill site, located at the mouth of Whatcom Creek may be present under fill deposits. Other mid-19th century and later structures of interest within the project area include the Sehome Dock (the Bellingham Bay Coal Company's Wharf); Colony Wharf (Fairhaven Land Company's Wharf); Geltrec Improvement Company's Wharf and Saw Mill. Because Bellingham went through a period of "wharfing out" just before the Constitutional convention in the late 1880's, there may be other structures built along the shoreline in addition to those listed above.

A low probability for significant historic archaeological resources exists within the project area since much of the project area is fill deposits from the 1900s. These fill deposits were placed over tidal flats that did not contain structures during historic times. Isolated artifacts would probably not retain integrity of location and cannot answer research questions pertaining to the history of the area.

One historic site, Fort Bellingham (45WH185H), was recorded in the vicinity of the project area. The site is on a high bluff on the north shore of

Bellingham Bay. The fort was constructed in 1856 in response to the Indian Wars of 1855-1856. Fort Bellingham was a palisaded fort containing a store, mess hall, headquarters, barracks, and two blockhouses. A large wharf was also constructed at the foot of the bluff directly below the fort and extended into the Bay (Schneider 1969). The fort was in operation until 1861 and then was abandoned. The land was returned to the original property owners in 1868 (Schneider 1969). Nothing remains of the site today and only a few artifacts related to the occupation are present in the collections at Whatcom Museum of History and Art (Schneider 1969). The site was nominated for inclusion in the NRHP in 1969. Fort Bellingham was not accepted for listing in the NRHP, but was placed in the Washington State Register (now the Washington Heritage Register) in 1971. This area will not be affected by any of the proposed project alternatives.

### Historic Structures

A review of the National Register of Historic Places Register, the Washington Heritage Register, and the Whatcom County Historic Property Register indicated that no historic structures that would be affected by the proposed project are recorded within the project area. However, the citizens Dock area is potentially relevant to the project alternatives.

- **Citizen's Dock.** Citizen's Dock was inventoried and nominated to the NRHP by Michael Sullivan in 1980 (Sullivan 1980a, b). The dock was constructed as a passenger terminal and freight warehouse in 1913 on pilings above the tidewaters at the mouth of Whatcom Creek (Sullivan 1980b). The dock was modeled after the Coleman Dock in Seattle and provided Bellingham with a link to Puget Sound's Mosquito Fleet (Sullivan 1980b). A large wooden building was constructed on top of the dock to serve as the passenger waiting area, warehouse, baggage space, ticket sales area, and offices (Sullivan 1980b). The dock was used for public transportation and as a freight warehouse until 1938. After 1938, passenger steamship service was terminated and the dock was used solely for freight service until 1971 (Sullivan 1980b). Currently the dock is used by tugs and barges. Citizen's Dock was sold to the City of Bellingham in 1980 and may be incorporated into a planned Maritime Heritage Waterfront Park (Sullivan 1980b). Citizen's Dock was placed in the NRHP in 1981. However, due to its unsafe condition, the City of Bellingham removed the dock, cutting the pilings just above the existing mud-line.

## 3.6.2 Archaeological or Historical Resource Issues by Site Area

Most of the work activities potentially associated with cleanup of the Whatcom Waterway site would occur in previously-dredged and/or recently deposited sediments where the potential for encountering significant, in-tact archaeological or historical resources is considered to be low. Considerations by site area are described below.

## Outer Whatcom Waterway (Unit 1)

The Outer Whatcom Waterway area consists of historically dredged sediments that are not expected to contain archaeological resources.

## Inner Whatcom Waterway (Units 2 and 3)

The majority of the Inner Whatcom Waterway area consists of historically dredged sediments that are not expected to contain archaeological resources. However, in the very head of the Whatcom Waterway (Unit 3-A) near the Roeder Avenue Bridge there is some potential for archaeological and/or historical resources to be contained within project sediments. Additional evaluation by an archaeological consultant could be warranted in these areas. Citizens Dock was a historic structure located in this area, but it was removed by the City for safety concerns.

## Log Pond (Unit 4)

The Log Pond area consists of previously dredged, filled and capped areas. The probability for encountering significant archaeological or historical resources is considered remote.

## Areas Offshore of ASB (Unit 5)

The ASB shoulder is located offshore of any historic structures or shorelines. The probability for encountering significant archaeological or historical resources in this area is considered remote.

## Area Adjacent to BST (Unit 6)

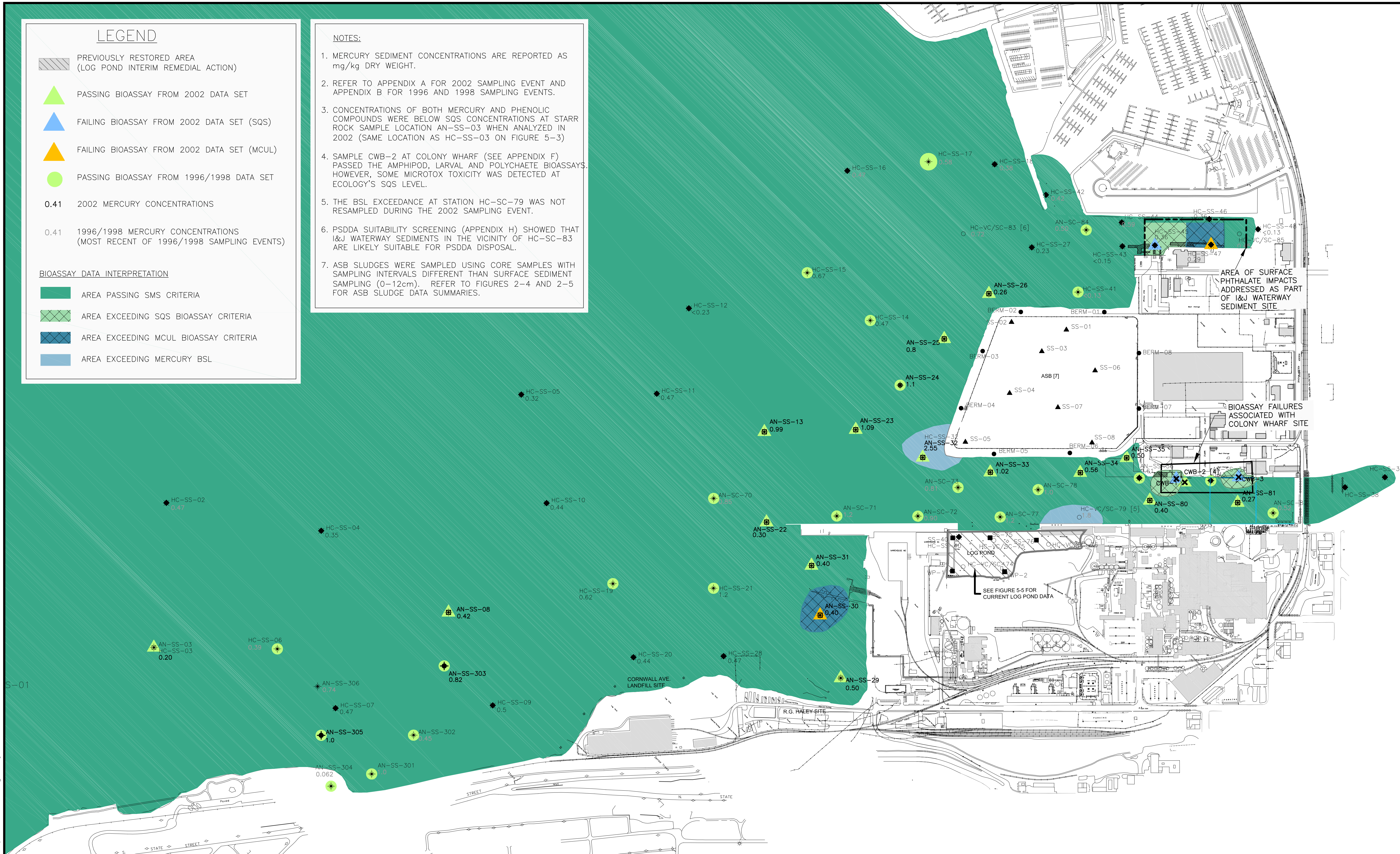
Portions of the Barge Dock area have historically been dredged, and the BST area was filled and armored for navigation improvements. The probability for encountering significant archaeological or historical resources in this area is considered remote.

## Starr Rock (Unit 7)

The Starr Rock Area consists of relatively deep-water offshore areas. The area was used during the 1960s as a dredge material disposal site. The probability for encountering significant archaeological or historical resources is considered remote in this area.

## ASB (Unit 8)

The ASB Interior was previously dredged by Georgia Pacific at the time the ASB was created. The probability for encountering significant archaeological or historical resources is considered remote.




# LEGEND

- PREVIOUSLY RESTORED AREA (LOG POND INTERIM REMEDIAL ACTION)
- PASSING BIOASSAY FROM 2002 DATA SET
- FAILING BIOASSAY FROM 2002 DATA SET (SQS)
- FAILING BIOASSAY FROM 2002 DATA SET (MCUL)
- PASSING BIOASSAY FROM 1996/1998 DATA SET
- 0.41 2002 MERCURY CONCENTRATIONS
- 0.41 1996/1998 MERCURY CONCENTRATIONS (MOST RECENT OF 1996/1998 SAMPLING EVENTS)

BIOASSAY DATA INTERPRETATION

- AREA PASSING SMS CRITERIA
- AREA EXCEEDING SQS BIOASSAY CRITERIA
- AREA EXCEEDING MCUL BIOASSAY CRITERIA
- AREA EXCEEDING MERCURY BSL

NOTES:

1. MERCURY SEDIMENT CONCENTRATIONS ARE REPORTED AS mg/kg DRY WEIGHT.
2. REFER TO APPENDIX A FOR 2002 SAMPLING EVENT AND APPENDIX B FOR 1996 AND 1998 SAMPLING EVENTS.
3. CONCENTRATIONS OF BOTH MERCURY AND PHENOLIC COMPOUNDS WERE BELOW SQS CONCENTRATIONS AT STARR ROCK SAMPLE LOCATION AN-SS-03 WHEN ANALYZED IN 2002 (SAME LOCATION AS HC-SS-03 ON FIGURE 5-3)
4. SAMPLE CWB-2 AT COLONY WHARF (SEE APPENDIX F) PASSED THE AMPHIPOD, LARVAL AND POLYCHAETE BIOASSAYS. HOWEVER, SOME MICROTOX TOXICITY WAS DETECTED AT ECOLOGY'S SQS LEVEL.
5. THE BSL EXCEEDANCE AT STATION HC-SC-79 WAS NOT RESAMPLED DURING THE 2002 SAMPLING EVENT.
6. PSDDA SUITABILITY SCREENING (APPENDIX H) SHOWED THAT I&J WATERWAY SEDIMENTS IN THE VICINITY OF HC-SC-83 ARE LIKELY SUITABLE FOR PSDDA DISPOSAL.
7. ASB SLUDGES WERE SAMPLED USING CORE SAMPLES WITH SAMPLING INTERVALS DIFFERENT THAN SURFACE SEDIMENT SAMPLING (0-12cm). REFER TO FIGURES 2-4 AND 2-5 FOR ASB SLUDGE DATA SUMMARIES.

RETEC

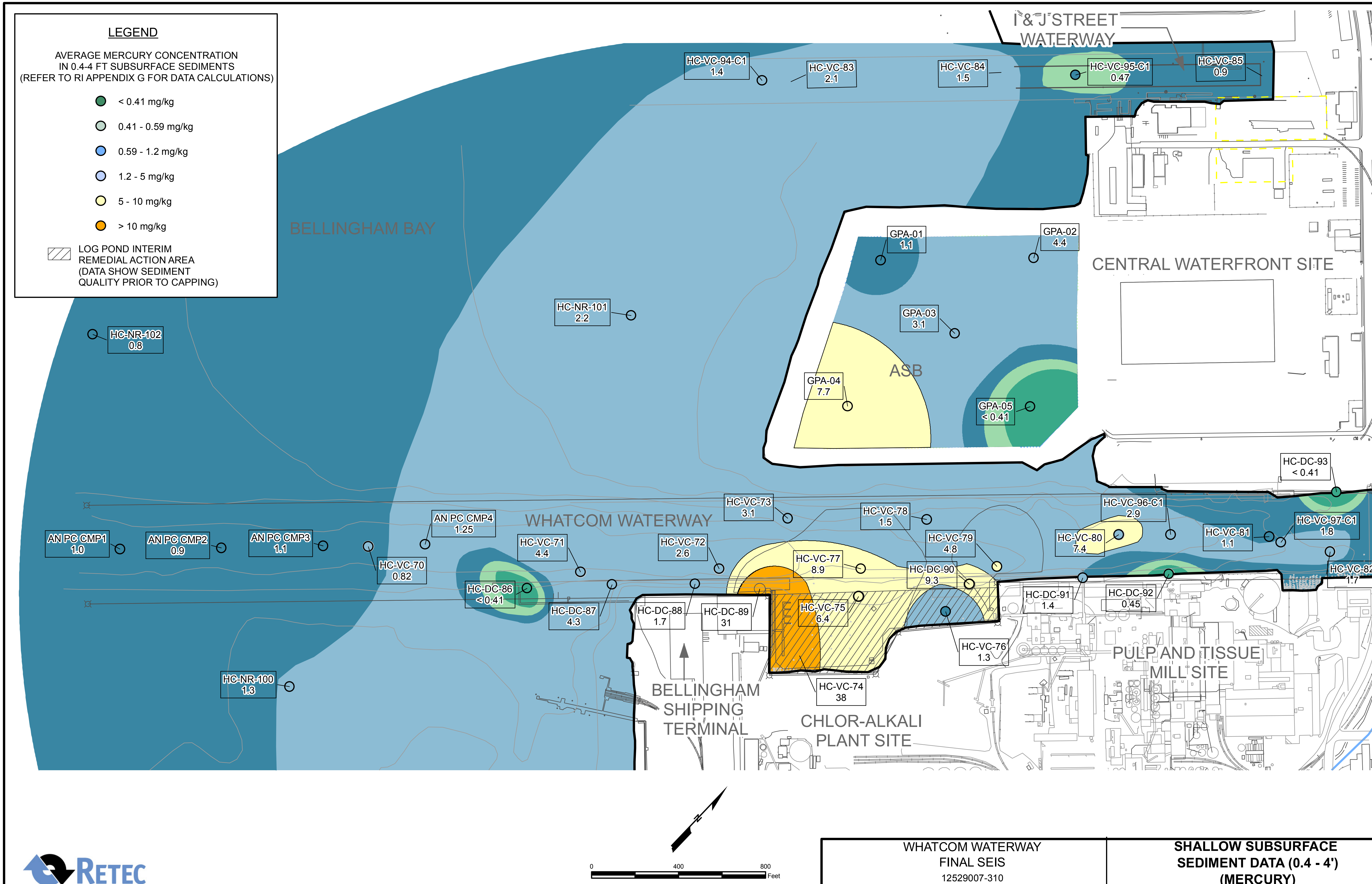
WHATCOM WATERWAY
ENVIRONMENTAL IMPACT STATEMENT
PORTB-18876

DATE: 10/09/06 | DRWN: E.M./SEA

**MOST RECENT SURFACE SEDIMENT BIOASSAY DATA AND BSL EXCEEDANCE AREAS**

**FIGURE 3-1**

File: H:\18876\EIS\18876S322.dwg Layout: FIGURE 3-1 User: seacad Plotted: Oct 09, 2006 - 9:44am Xref's:

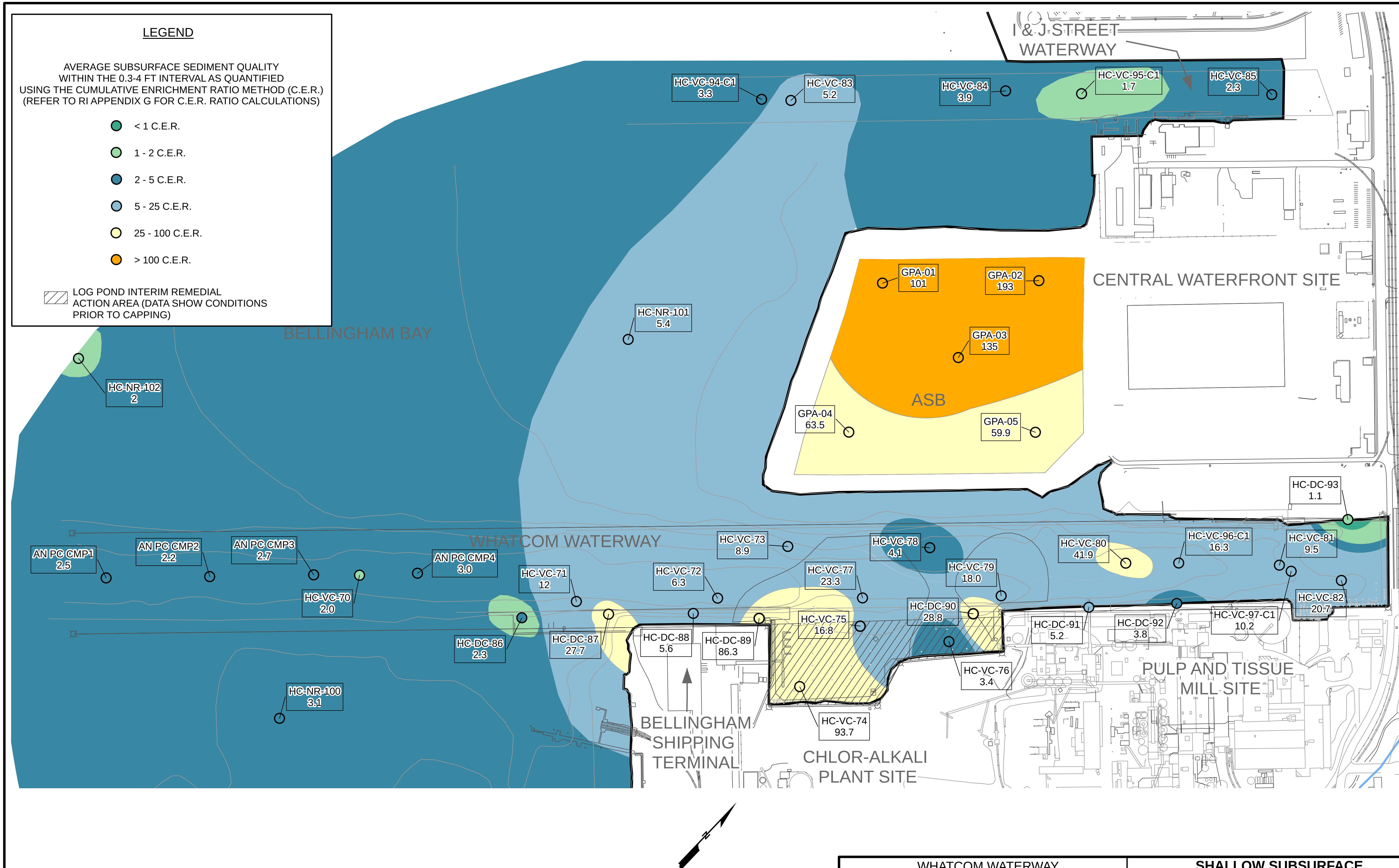



WHATCOM WATERWAY
FINAL SEIS
12529007-310

**SHALLOW SUBSURFACE SEDIMENT DATA (0.4 - 4')**
**(MERCURY)**

DATE: 9/05/07 | DWN. BY: MVI/sea | FILE: T:/POB_WHATCOM/PROJECTS/erhg_HC2.MXD

**FIGURE: 3-2**



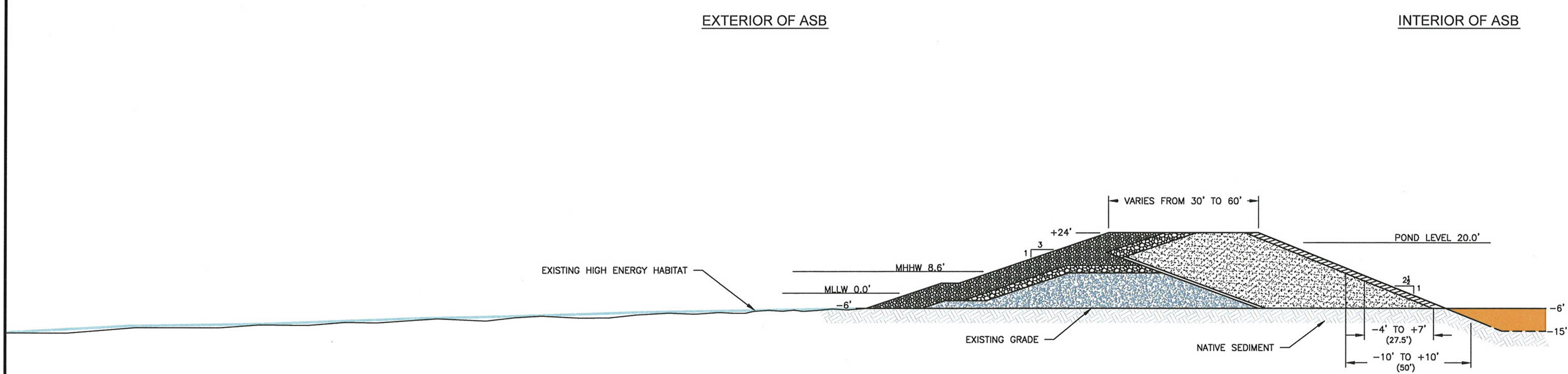

RETEC

WHATCOM WATERWAY
FINAL SEIS
12529007-310

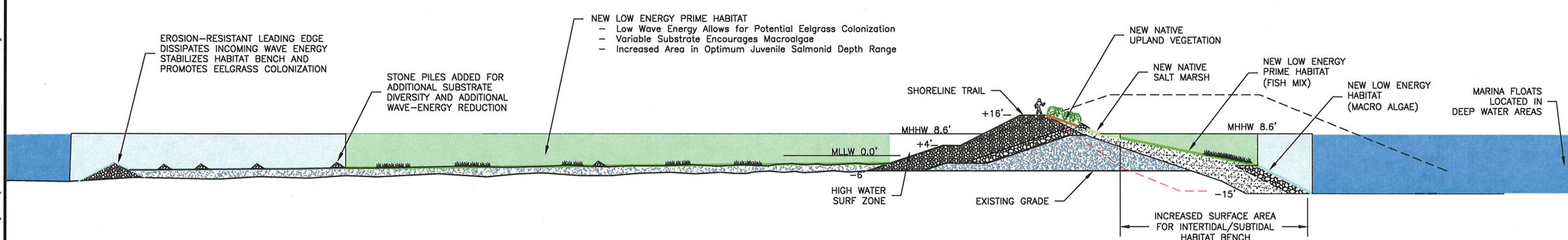
**SHALLOW SUBSURFACE SEDIMENT DATA (0.4-4) (CUMULATIVE ENRICHMENT RATIO)**

DATE: 9/2007 | DWN. BY: KBL/ftc | FILE: T:/POB_WHATCOM/PROJECTS/CER_HC.MXD

**FIGURE: 3-3**




# EXISTING CONDITIONS




20 0 40

SCALE IN FEET

# PRELIMINARY DESIGN CONCEPT

RETEC

| WHATCOM WATERWAY<br>ENVIRONMENTAL IMPACT STATEMENT<br>12529007 | PRELIMINARY DESIGN CONCEPT<br>ASB BERM RECONFIGURATION |
|---|---|
| DATE: 09/04/07 DRWN: D.T./SEA | FIGURE 3-4 |

**Figure 3-5**
**Shoreline Infrastructure and Dredging Patterns in the Outer Waterway**

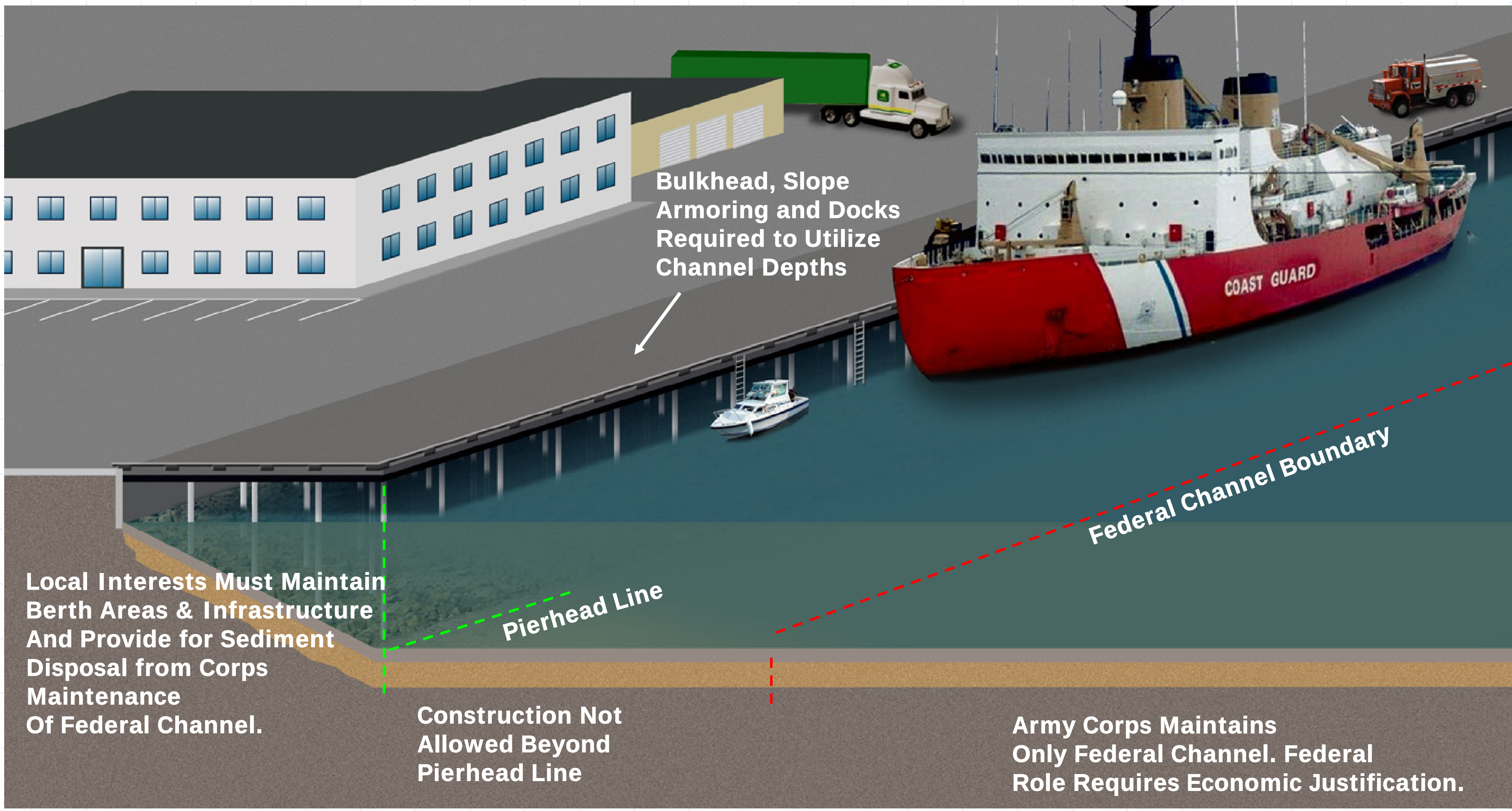
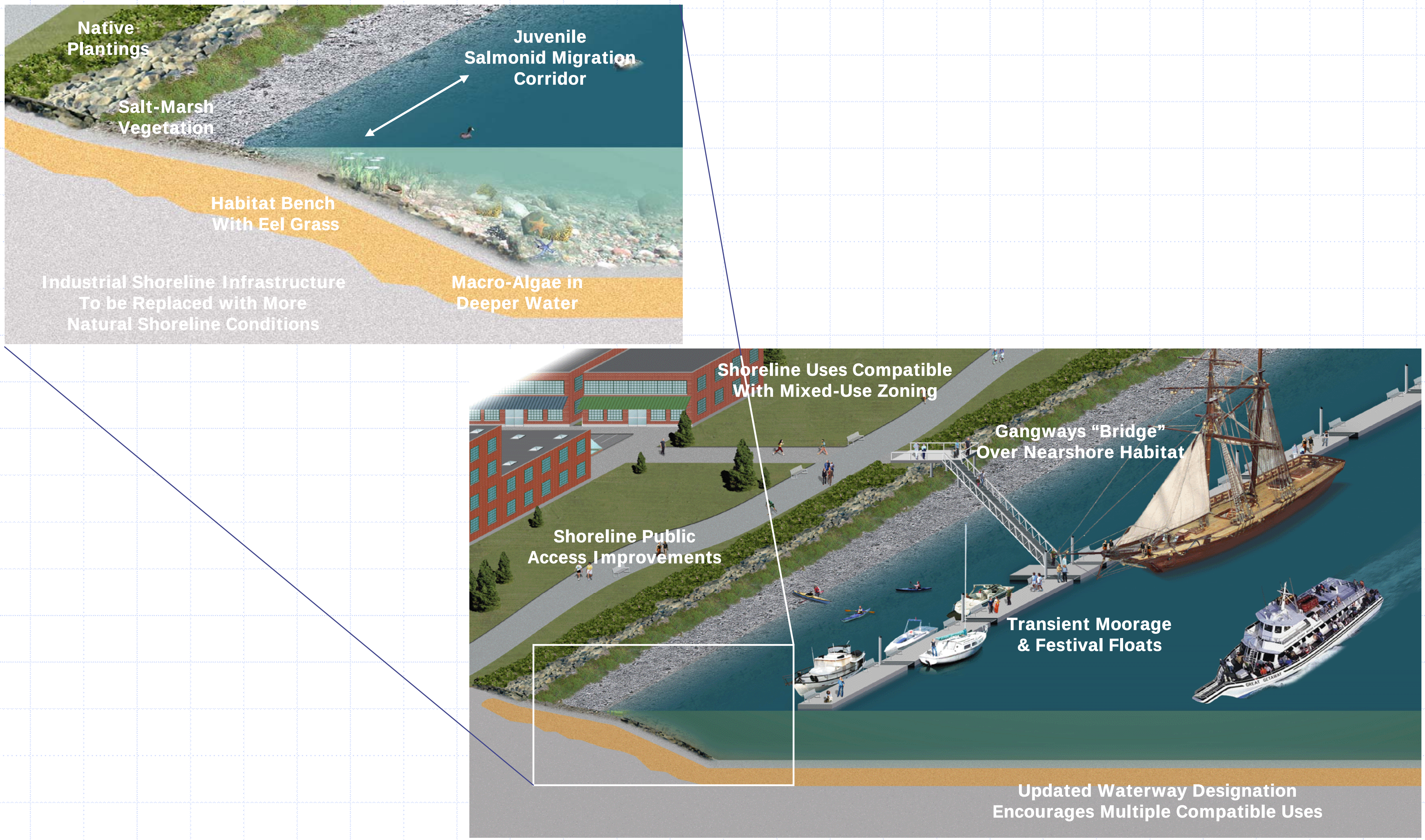
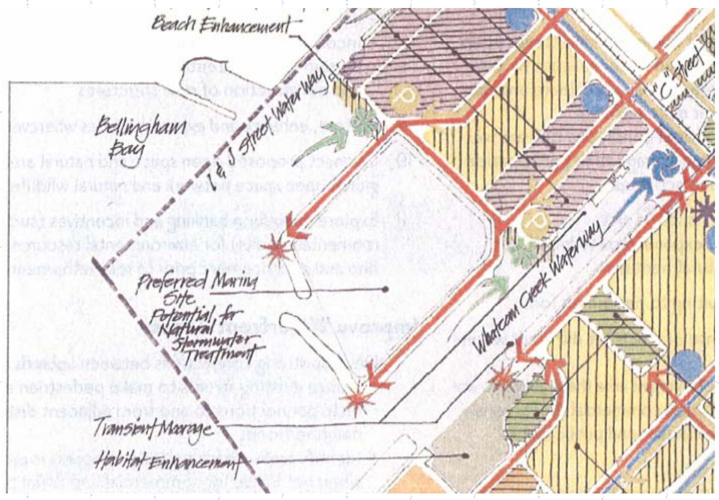


**Figure 3-6**
**Shoreline Infrastructure Design Concept for Multi-Purpose Inner Waterway**



# Figure 3-7
# ASB Marina Design Concepts

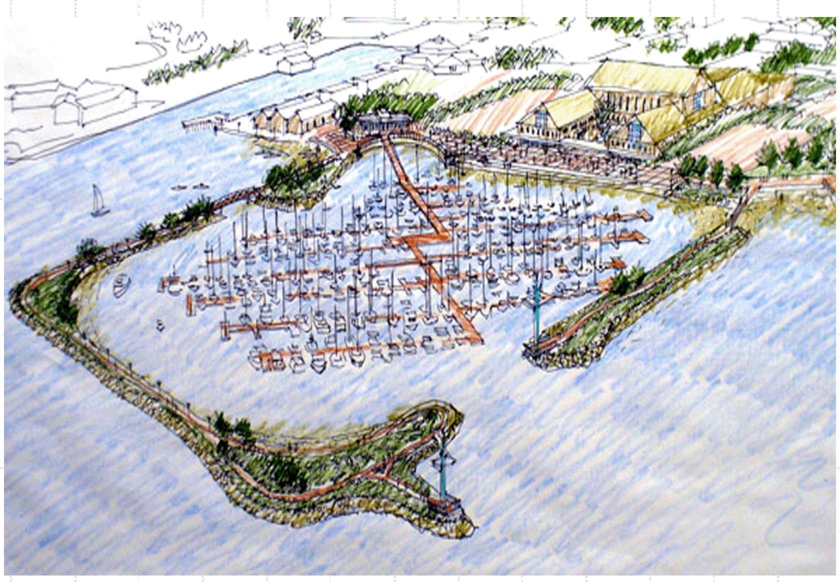
## Early Design Concepts




Waterfront Futures Group Concept Drawing

Initial Concept at Time of Port Update to Comprehensive Scheme of Harbor Improvements

## Updated Concepts from 2006 Waterfront Design Charette



Overview Showing Public Access And Habitat Enhancements Along Breakwater

Design Concepts for Waterfront Trail System

Illustration of Linkages Between Marina and Other Waterfront Revitalization Efforts Along the Inner and Outer Whatcom Waterway

# 4 SEPA Analysis Project Alternatives

This section includes a description of each of nine EIS alternatives and their associated environmental impacts, benefits and/or mitigation. The alternatives include a SEPA No Action alternative, as well as eight alternatives evaluated in the FS Report. The numbering of the Alternatives has been maintained consistent between the RI/FS and this FSEIS to facilitate comparison between the two documents.

Table 4-1 provides a concise description of each of the Alternatives including alternative costs, remedial technologies used, and land use implications for the Whatcom Waterway and ASB.

## Table 4-1 Concise Summary of Evaluated Alternatives

| Alternative Description | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Cleanup Technologies Applied | | | | | | Land Use | |
| Cleanup Alt. | Probable Cost [1] ($ Million) | Institutional Controls | Monitored Natural Recovery | Containment | Removal & Disposal | Treatment | Reuse & Recycling | Whatcom Waterway | ASB |
| No Action (Fig 4-1) | $ 0 | Yes | Yes | Yes | — | — | — | Limited-Use Channel | Non-Aquatic (Not Capped) |
| Alt. 1 (Fig 4-2) | $ 8 | Yes | Yes | Yes | — | — | — | Limited-Use Channel | Non-Aquatic (Capped) |
| Alt. 2 (Fig 4-3) | $ 34 | Yes | Yes | Yes | — | — | — | Dredged for 1960s Industrial Channel | Non-Aquatic (Capped) |
| Alt. 3 (Fig 4-4) | $ 34 | Yes | Yes | Yes | — | — | — | Dredged for 1960s Industrial Channel | Non-Aquatic (Filled) |
| Alt. 4 (Fig 4-5) | $ 22 | Yes | Yes | Yes | Yes | — | — | Dredged for Multi-Purpose Channel | Non-Aquatic (Capped) |
| Alt. 5 (Fig 4-6) | $ 42 | Yes | Yes | Yes | Yes | Yes | Yes | Dredged for Multi-Purpose Channel | Aquatic (Opened to Bay) |
| Alt. 6 (Fig 4-7) | $ 44 | Yes | Yes | Yes | Yes | Yes | Yes | Dredged for Multi-Purpose Channel | Aquatic (Opened to Bay) |
| Alt. 7 (Fig 4-8) | $ 74 | Yes | Yes | Yes | Yes | Yes | Yes | Dredged for 1960s Industrial Channel | Aquatic (Opened to Bay) |
| Alt. 8 (Fig 4-9) | $ 146 | Yes | Yes | Yes | Yes | Yes | Yes | Dredged for 1960s Industrial Channel | Aquatic (Opened to Bay) |

Note 1. Costs shown in Table 4-1 exclude costs associated with mitigation of SEPA adverse environmental impacts.

Table 4-2 provides a more comprehensive side-by-side description of each of the alternatives, with detailed descriptions of actions to be conducted in each area of the site. Table 4-2 also summarizes the impacts, benefits and mitigation associated with each alternative. Figures 4-1 through 4-9 illustrate the design concept of each of the alternatives.

The following sections describe each of the nine EIS alternatives and their environmental impacts, benefits and mitigation. Refer to Section 3 for additional background information on the elements of the environment discussed in this Section.

# 4.1 Project No Action Alternative

Figure 4-1 illustrates the design concept for the No Action project alternative. This alternative does not comply with MTCA cleanup requirements.

## 4.1.1 Alternative Description

As its name suggests, the No Action alternatives does not include active remediation, monitoring, or other actions in any site areas. Some sediment recovery through natural processes of sedimentation will occur in portions of the site, but these actions will not be monitored, and no contingencies will be in place should recovery fail to achieve site cleanup levels.

### Actions by Site Area

Actions performed under the No Action Alternative are described below by site area.

- **Outer Whatcom Waterway (Unit 1):** Under the No Action Alternative, no dredging or capping will be performed in the outer portion of Whatcom Waterway. Surface sediments in this area currently comply with SMS criteria. Subsurface impacted sediments would remain in place beneath the clean surface sediments. Some reduction in waterway depth would result under this alternative. No monitoring, institutional controls or other measures are included to ensure that subsurface contaminated sediments are not disturbed.

- **Inner Whatcom Waterway (Units 2 & 3):** As with the Outer Whatcom Waterway, no dredging, capping, monitoring or institutional controls would be performed in the Inner Whatcom Waterway. The majority of this area has naturally recovered, with some surface contamination remaining in nearshore berth areas along the Colony Wharf portion of the Central Waterfront site, and in an area near the Log Pond. Future use of the Inner Whatcom Waterway would be encumbered by areas of shoaling at the head of the waterway and in berth areas. No shoreline stabilization is conducted under this alternative.

- **Log Pond (Unit 4):** The Log Pond area was previously remediated as part of an Interim Action implemented in 2000. Subsequent monitoring has demonstrated the protectiveness of the subaqueous cap, and the effectiveness of habitat enhancement actions completed as part of that project. However, some erosion in shoreline areas has been noted during 5-year monitoring. No further actions would be taken in this area under the No Action Alternative.

- **Areas of ASB (Unit 5):** Exceedances of site-specific cleanup levels within Unit 5-B have been noted. However, no capping, dredging, institutional controls or monitoring will be performed in this area.

- **Areas near Bellingham Shipping Terminal (Unit 6):** Exceedances of site-specific cleanup levels within Units 6-B and 6-C have been noted. However, no capping, dredging, institutional controls or monitoring will be performed in these areas.

- **Starr Rock (Unit 7):** Sediments in the Starr Rock area currently comply with site-specific cleanup levels. No capping, dredging, institutional controls or monitoring will be performed in this area.

- **ASB (Unit 8):** The ASB will not be remediated under this Alternative. The presence of the impacted sludges will prevent future aquatic reuse of the ASB.

### Sediment Disposal

No sediment dredging is included in the No Action Alternative. No sediment disposal sites are required under this alternative.

### Costs & Schedule

The No Action Alternative has no project costs or actions associated with its implementation. However, costs may be substantial to conduct mitigation of impacts associated with the No Action Alternative.

## 4.1.2 Impacts, Benefits and Mitigation

Table 4-2 summarizes the environmental impacts, benefits, and mitigation associated with the No Action alternative.

### Geology, Water and Environmental Health

The No Action alternative produces net adverse impacts with respect to geology, water, and environmental health. Significant impacts and potential mitigation requirements include the following:

- **Adverse Impact – Cleanup Not Performed:** The No Action alternative does not comply with MTCA or SMS regulations.

Environmental health is not protected under this alternative. Potential impacts to human health and/or environmental receptors are not controlled. Mitigation of these impacts will require additional remedial measures as provided in the other project alternatives.

- **No Change – No Construction Disturbances to Water Quality:** The No Action alternative does not involve construction activities. Therefore there will be no construction impacts to existing water quality. This avoids adverse impacts associated with construction activities.

- **Adverse Impacts – Sediment Resuspension:** The No Action alternative does not conduct remediation or apply institutional controls in navigation areas. The potential for resuspension of impacted subsurface sediments is not controlled. Mitigation of this potential impact would require the implementation of additional remediation.

- **Adverse Impact – Interference with Shoreline Stabilization:** The shorelines in the Inner Whatcom Waterway include areas where shoreline infrastructure has degraded to the point that the shorelines are unstable. Because no actions are conducted to stabilize and remediate these shoreline areas, shoreline erosion will likely occur, resulting in impacts to upland property. The presence of the contamination will hinder future shoreline stabilization projects. Impacts associated with shoreline erosion and/or recontamination may also occur in the Log Pond, since the No Action alternative does not include the shoreline enhancements provided under the other project alternatives.

## Fish and Wildlife

The No Action alternative results in net adverse impacts to fish and wildlife category. Significant impacts and potential mitigation requirements include the following:

- **Adverse Impact – Lack of Environmental Protectiveness:** The No Action alternative does not protect fish or wildlife from potential contamination impacts. These potential impacts offset other potential benefits associated with the No Action alternative. The mitigation of this issue will require implementation of additional cleanup measures as provided under the other project alternatives.

- **No Change – No Construction Disturbances:** Because the No Action alternative does not involve construction activities, this alternative does not trigger short-term disruptions associated with dredging and capping activities.

- **Beneficial Impact – Preservation of Nearshore Habitats:** The No Action alternative does not change bottom contours in the Waterway or harbor areas. Where emergent nearshore aquatic habitats have developed, these areas would remain undisturbed under this Alternative. However, the No Action Alternative does not ensure that this preservation will be maintained over the long-term.

## Land Use, Navigation and Public Shoreline Access

The No Action alternative conflicts with community land use, navigation and public shoreline access plans. The alternative results in significant net adverse impacts under these environmental categories. Mitigation of these impacts requires additional actions, as are conducted under other project alternatives:

- **Adverse Impacts – Outer Whatcom Waterway Navigation:** The No Action Alternative does not remove impacted sediments in the Outer Whatcom Waterway. The presence of residual impacted sediments will impact the effective water depth of the terminal area. Current water depths range from about 30 feet to over 35 feet below MLLW, but dredging will be required in the future to maintain navigation depth. Such dredging would resuspend impacted sediments unless the dredging was precluded below the current mudline. This would effectively limit the usable and maintainable water depth in this area to a minimum of approximately 25 to 26 feet below MLLW. The restoration of deep draft use capabilities at the Bellingham Shipping Terminal consistent with the current infrastructure and channel dimensions would require implementation of sediment removal as provided under other project alternatives (Alternatives 2 through 8).

- **Adverse Impacts – Inner Whatcom Waterway Navigation:** The Inner Whatcom Waterway has highly variable mud-line elevations. Shoaling is present particularly at the head of the waterway (near the Roeder Avenue bridge) and along the berth areas of the Central Waterfront shoreline. Effective water depths (the usable water depth along the current pierhead line) in this area vary from about -7 feet MLLW to areas that are exposed at low tide. Under the No Action Alternative, navigation in many of these areas would be impaired or effectively precluded, because insufficient depth would remain to allow for vessel traffic or for future waterway maintenance and navigation. Because waterway sediments would not be managed actively through capping and/or removal as under other project alternatives, project construction planning and permitting for any future shoreline activities along the Waterway would have greater recontamination risks, and this would tend to limit redevelopment flexibility of these nearshore areas. Mitigation of these impacts would require implementation of additional active remediation as provided under other project alternatives.

- **Beneficial Impacts – Habitat Preservation and Enhancement:** The No Action Alternative would result in preservation of emergent nearshore habitat at the head and along the sides of the Inner Whatcom Waterway. As noted above, the No Action Alternative does not provide long-term protectiveness for these habitat areas. Preserving and enhancing nearshore habitat along salmon migration corridors is consistent with the Bellingham Bay Comprehensive Strategy and will benefit juvenile salmonids and other fish and wildlife species.

- **Adverse Impact – Conflict with Planned ASB Reuse:** The ASB has been identified in previous land use studies as the preferred location for development of a future environmentally sustainable marina with integrated public access and habitat enhancements. The No Action Alternative does not remediate the ASB and directly conflicts with this planned reuse. Mitigation of this impact would require remediation of the ASB as provided under other project alternatives (Alternatives 5, 6, 7 or 8).

### Air and Noise

The No Action alternative does not involve new construction activities. No changes to existing air quality or noise levels are anticipated under this alternative.

### Cultural Resources

The No Action alternative does not involve construction-associated impacts to historical or cultural resources.

# 4.2 Project Alternative 1

Alternative 1 uses containment, monitored natural recovery, and institutional controls to comply with SMS cleanup levels and MTCA cleanup requirements. Alternative 1 makes the least use of active remedial technologies of all of the alternatives evaluated in the FS Report.

## 4.2.1 Alternative Description

Alternative 1 is illustrated in Figure 4-1. The application of active cleanup measures and institutional controls is detailed in Table 4-2 for each Site Unit:

### Actions by Site Area

Actions performed under Alternative 1 are described below by site area.

- **Outer Whatcom Waterway (Unit 1):** Under Alternative 1, no dredging or capping will be performed in the outer portion of Whatcom Waterway. Surface sediments in this area currently comply with SMS criteria. Subsurface impacted sediments would remain in place beneath the clean surface sediments. Some reduction in waterway depth would result under this alternative. Future channel maintenance would likely be restricted beneath elevations of approximately 26 feet below MLLW in order to avoid resuspension of impacted subsurface sediments. This depth restriction would need to be addressed in Waterway planning and site institutional controls.

- **Inner Whatcom Waterway (Units 2 & 3):** As with the Outer Whatcom Waterway, no dredging or capping would be performed in the Inner Whatcom Waterway under Alternative 1. The majority of this area has naturally recovered, with some surface contamination remaining in nearshore berth areas along the Colony Wharf portion of the Central Waterfront site. Additional recovery time will be required to achieve full restoration of this area. Reductions in waterway depths will accompany the use of natural recovery in the Inner Whatcom Waterway areas. Additional recovery modeling would be required as part of Cleanup Action Plan development and/or remedial design to verify the applicability of natural recovery for this area. Institutional controls and monitoring are included for the Inner Whatcom Waterway area.

- **Log Pond (Unit 4):** The Log Pond area was previously remediated as part of an Interim Action implemented in 2000. Subsequent monitoring has demonstrated the protectiveness of the subaqueous cap, and the effectiveness of habitat enhancement actions completed as part of that project. Actions in this area will include enhancements to the shoreline edges of the cap, to ensure long-term stability of the cap. These enhancements are described in Appendix D of the FS Report.

- **Areas Offshore of ASB (Unit 5):** Exceedances of site-specific cleanup levels within Unit 5-B will be remediated using sub-aqueous capping. Appendix C of the FS Report describes the design concept for this area, including methods to maintain cap stability in a manner compatible with anticipated permitting requirements. The remaining areas of Unit 5 comply with site-specific cleanup levels. No sediment capping or dredging is proposed for these areas at this time. Additional evaluations of sediment stability will be conducted as part of engineering design. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

Additional measures will be taken in this area only if engineering design evaluations indicate that such measures are required.

- **Areas near BST (Unit 6):** The area south of the barge docks at the Bellingham Shipping (Units 6-B and 6-C) exceeds SMS cleanup levels. This area will be remediated using a deep-water sub-aqueous cap. Final water depths in this area will be greater than -18 feet MLLW in most areas, consistent with shoreline infrastructure and navigation uses historically conducted there. The cap will be constructed of coarse granular materials and will be designed to resist potential prop-wash erosion effects. The remaining portions of Unit 6 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **Starr Rock (Unit 7):** Sediments in the Starr Rock area currently comply with site-specific cleanup levels. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **ASB (Unit 8):** The sludges within the ASB will be remediated using a thick sub-aqueous cap. Prior to cap placement, the treatment equipment (aerators, weirs, etc.) would be removed from the ASB. The conceptual design for the cap includes a nominal 3-foot layer of sandy capping material, with coarse materials placed in nearshore areas where wind-driven wave action may be significant.

## Sediment Disposal

No sediment dredging is included in Alternative 1. All impacted sediments are managed in-place using containment technologies (capping) and monitored natural recovery. No sediment disposal sites are required under this alternative.

## Costs and Schedule

Alternative 1 is the lowest cost of the eight alternatives evaluated in the FS Report. The total probable cost of Alternative 1 is $8 million. Most of this cost is associated with the capping of the ASB sludges and the two impacted harbor areas. Additional costs are included to provide for long-term monitoring of capping and natural recovery areas. Mitigation costs are not included in the $8 million probable cost estimate.

The construction activities in Alternative 1 can likely be completed within a single construction phase. The capping activities in the two impacted harbor areas would be completed during appropriate times of the year when the potential for impacts to juvenile salmonids is minimized. These construction “fish windows” (the time periods during which in-water construction can be performed while minimizing potential impacts to juvenile salmonids) are typically specified as part of project permitting requirements. Because the ASB area is not connected to Bellingham Bay, the capping activities within the ASB will not necessarily be time-limited by the “fish windows.”

Monitoring of capped and natural recovery areas will occur under Alternative 1. Previous recovery analyses performed as part of the Remedial Investigation suggest that 5 and 10 years may be required for the sediment areas near the Colony Wharf portion of the Central Waterfront site. Site-specific recovery modeling would be required as part of Cleanup Action Plan development or remedial design to verify the effectiveness of this alternative.

## 4.2.2 Impacts, Benefits and Mitigation

Table 4-2 summarizes the environmental impacts, benefits, and mitigation associated with Alternative 1.

### Geology, Water and Environmental Health

Alternative 1 produces net adverse impacts under the category including geology, water, and environmental health. Significant impacts and potential mitigation requirements include the following:

- **Beneficial Impact – Sediment Cleanup:** Alternative 1 produces a beneficial impact through remediation and compliance with site cleanup levels consistent with MTCA and SMS requirements. Active cleanup is performed in the ASB Shoulder (Unit 5-B) area, the Barge Dock (Unit 6-B/C) and within the ASB. Monitored natural recovery and institutional controls are used to remediate other areas.

- **Mitigated Impact – Construction Water Quality:** Alternative 1 includes capping activities in Units 5B, 6B and 6C. This capping will result in short-term disturbances to water quality during placement of capping material. These impacts can be mitigated through the use of best practices for design and construction of the caps. For capping of the ASB, the cap material would be placed without opening the facility to surface water. For the other two capping areas, water quality control will be achieved through use of appropriate equipment and cap materials, and the controlled placement of cap material. The use of highly dispersive placement methods (e.g., hydraulic placement) for capping of the Unit 5 and Unit 6 areas should be avoided. The project will include additional state and federal agency review as part of project design and permitting.

- **Beneficial Impact – Control of Sediment Resuspension:** Alternative 1 remediates the Whatcom Waterway navigation areas using monitored natural recovery and institutional controls. While these actions may impact land uses (see below), these actions would reduce the potential for sediment resuspension relative to the No Action Alternative.

- **Adverse Impact – Interference with Shoreline Stabilization:** Portions of the shoreline infrastructure in the Inner Whatcom Waterway have degraded, resulting in shoreline instability. Because no actions are conducted to stabilize and remediate these shoreline areas, shoreline erosion may occur, resulting in impacts to upland property. The presence of contaminated sediment in berth areas will tend to interfere with public or private shoreline stabilization efforts. Mitigation of these impacts would require either development of stable shoreline slopes as under project Alternatives 4, 5 and 6, or the installation of new hardened shoreline infrastructure as in project Alternatives 2, 3, 7 or 8.

- **Beneficial Impact – Log Pond Shoreline Stabilization:** Limited erosion has been noted in some shoreline edges of the Log Pond cap. Under Alternative 1, these erosional areas would be corrected, resulting in improved long-term performance of the Log Pond cap, and prevention of erosion and/or recontamination.

## Fish and Wildlife

Alternative 1 results in net beneficial impacts to fish and wildlife. Significant impacts, benefits and mitigation associated with Alternative 1 include the following:

- **Beneficial Impact – Environmental Cleanup:** Completion of site cleanup and compliance with site cleanup levels will protect aquatic receptors from the effects of contaminated sediments.

- **Mitigated Impact – Construction Disturbances:** Construction of Alternative 1 will involve some in-water construction activities associated with capping in Unit 5B and in Units 6B and 6C. Potential disturbances to fish and wildlife could be mitigated in these areas through the use of best practices for project design, permitting and construction. Examples of best practices include 1) the timing of work activities within appropriate "fish windows" to avoid migration periods for juvenile salmonids or other sensitive species, 2) the use of construction equipment, cap materials and placement methods that minimize water quality impacts, noise and physical disturbances to aquatic habitats, and 3) completion of additional environmental reviews as part of project design and permitting. These measures are considered likely to mitigate the impacts associated with construction disturbances under Alternative 1.

- **Beneficial Impacts – Preservation of Inner Whatcom Waterway Habitat:** Alternative 1 does not change bottom contours in the Inner Whatcom Waterway. However, where emergent nearshore aquatic habitats have developed, these areas would remain undisturbed, and disturbance of these areas would be restricted as part of the site institutional controls. The protection of these emergent habitat areas represents a beneficial impact for fish and wildlife.

- **Mitigated Impacts – Log Pond Shoreline Enhancements:** Construction of Alternative 1 will involve some in-water construction activities within the Log Pond to enhance the stability of the Log Pond shoreline. These actions will involve a change in substrate conditions in limited areas, with placement of pebbles and beach gravels in some areas, and placement of stone groins for material retention in other areas. The actions are expected to result in minimal changes to the area of intertidal habitat. Potential adverse impacts associated with substrate changes in some areas are offset by other nearshore habitat gains under the alternative.

- **Beneficial Impacts – Enhancement of Unit 5-B Habitat:** Alternative 1 develops additional nearshore aquatic habitat within Unit 5B, through the construction of an engineered cap. If constructed consistent with the design concept included in Appendix C of the FS Report, the cap will enhance the quality of between 4 and 6 acres of nearshore habitat, with improvements in elevation and reductions in wave energy. The enhancement of nearshore habitat quality in this area as accomplished under that design is consistent with restoration objectives of the Bellingham Bay Comprehensive Strategy and will benefit juvenile salmonids and other fish and wildlife species.

## Land Use, Navigation and Public Shoreline Access

Alternative 1 provides a slight enhancement of land use, navigation and public shoreline access uses relative to the No Action alternative. However, net adverse impacts continue to exist under this alternative that can only be mitigated through the implementation of additional actions.

- **Adverse Impact – Outer Whatcom Waterway Navigation:** Alternative 1 does not remove impacted sediments in the Outer Whatcom Waterway. The presence of residual impacted sediments represents a conflict with current and planned navigation uses in this area. Current depths range from about 30 feet to over 35 feet below MLLW, but dredging will be required in the future to maintain navigation depth. Such dredging would resuspend impacted sediments unless the dredging were precluded below the current mudline. This would effectively limit the usable and maintainable water depth in this area to a minimum of approximately 25 to 26 feet below MLLW, which is less than anticipated navigation requirements. This impact to navigation uses is integral to the alternative. The restoration of deep draft use capabilities at the Bellingham Shipping Terminal consistent with the current infrastructure and land use plans would require implementation of sediment removal as provided under other project alternatives (Alternatives 2 through 8).

- **Adverse Impacts – Inner Whatcom Waterway Navigation:** The Inner Whatcom Waterway area has highly variable mud-line elevations. Shoaling is present particularly at the head of the waterway (near the Roeder Avenue bridge) and along the berth areas of the Central Waterfront shoreline. Effective water depths (the usable water depth along the current pierhead line) in this area vary from about -7 feet MLLW to areas that are exposed at low tide. Under Alternative 1, navigation in many of these areas would be impaired or effectively precluded, because insufficient depth would remain to allow for vessel traffic or for future waterway maintenance and navigation. Because waterway sediments would not be managed actively through capping and/or removal as under other project alternatives, project construction planning and permitting for any future shoreline activities along the Waterway would have greater recontamination risks, and this would tend to limit redevelopment flexibility of these nearshore areas. Mitigation of these impacts would require implementation of additional active remediation as provided under other project alternatives.

- **Adverse Impact – Conflict with Planned ASB Reuse:** The ASB has been identified in previous land use studies as the preferred location for development of a future environmentally sustainable marina with integrated public access and habitat enhancements. Alternative 1 remediates the ASB by capping, which directly conflicts with this planned reuse. Mitigation of this impact would require remediation of the ASB as provided under other project alternatives (Alternatives 5, 6, 7 or 8).

## Air and Noise

Alternative 1 involves new construction activities associated with the placement of environmental caps in Unit 8, Unit 5B and Units 6B and 6C. Potential impacts to area noise and air quality levels will need to be mitigated to avoid environmental impacts. However, mitigation can be accomplished through the use of best practices for project design, permitting, and construction.

Potential mitigation measures for noise impacts include 1) contractual requirements to avoid exceedances of ambient noise level restrictions, 2) contractor use of appropriate equipment including mufflers as required, and

3) use of appropriate work periods if required to comply with noise level restrictions.

Air quality impacts associated with capping activities could be experienced either through emissions from construction equipment, or through dust from temporary stockpiles of capping material prior to placement. These impacts can be mitigated through 1) contractual requirements to avoid impacts to air quality, 2) the use of appropriate equipment meeting applicable air quality control requirements, 3) the use of appropriate construction measures (e.g., wetting or covering of cap material stockpiles to control fugitive dust emissions), or 4) the direct supply of cap material by barges to the capping site without stockpiling. These mitigation measures can be incorporated during project design and permitting.

### Cultural Resources

Alternative 1 does not involve any dredging activities or other construction activities that are likely to disrupt existing historical or archaeological resources. Additional review of these issues would be conducted as part of project permitting (e.g., through Section 106 consultations as part of Army Corps of Engineers permitting).

# 4.3 Project Alternative 2

Alternative 2 uses monitored natural recovery, institutional controls, and containment technologies to comply with SMS cleanup levels and MTCA cleanup requirements. The design concept for Alternative 2 is shown in Figure 4-3.

## 4.3.1 Alternative Description

Unlike Alternative 1, dredging of sediments from within the Whatcom Waterway channel is conducted. These sediments are managed in a new Confined Aquatic Disposal (CAD) facility that would be developed offshore of the Cornwall Avenue Landfill. The Cornwall CAD site location was selected during the 2000 EIS after evaluation of potential alternative locations.

Alternative 2 represents a modification of the preferred alternative from the 2000 RI/FS and EIS process. These analyses were based on continued industrial uses of the Central Waterfront and New Whatcom areas. These analyses also assumed that future land uses would comply with the restrictions applicable to continued maintenance of the 1960s industrial navigation channel in the Whatcom Waterway. Current zoning and land use planning have significantly changed since the 2000 evaluation.

### Actions by Site Unit

Actions conducted as part of Alternative 2 are described below by site area. Specific actions are listed by Site Unit in Table 4-2.

- **Outer Whatcom Waterway (Unit 1):** Under Alternative 2, the outer portion of the waterway would be dredged to a minimum depth of 35 feet below MLLW. Where technically feasible, the dredging depths would be increased to allow dredging to the base of the impacted sediments in the channel areas. Anticipated dredge depths vary from 35 feet below MLLW to about 41 feet below MLLW. The sediments removed during this dredging would be barged to the Cornwall CAD site location, and placed within the containment facility. The sediments from Units 1A and 1B would be used in upper portions of the CAD site, and the facility would be completed as described below. Some capping may be required in areas that are not technically feasible to dredge (to be determined during remedial design and permitting). Dredging methods used for the Outer Whatcom Waterway would likely be mechanical, reducing the entrained water management concerns applicable to hydraulic dredging, and producing dredge materials with physical properties appropriate for CAD site management. Detailed dredging and construction procedures and alternatives would be evaluated in project design and permitting.

- **Inner Whatcom Waterway (Units 2 & 3):** Under Alternative 2, sediment dredging would be performed as necessary to provide for future use and maintenance of the 1960s industrial navigation channel to the head of the waterway. The 1960s federal channel boundaries specify a water depth of 30 feet below MLLW from the Port terminal area to Maple Street. A depth of 18 feet is specified from Maple Street to the head of the waterway. In the Outer Whatcom Waterway, the dredging cut would be established at an elevation at least 35 feet below MLLW. This would remove sediments where technically feasible, and would provide sufficient overdepth to allow residual sediments to be capped without impeding future maintenance of the federal channel. The design concept assumes a cap thickness of 3 feet over dredged areas with residual subsurface sediment impacts. Due to historical encroachment of shoreline fills on the federal channel boundaries, many of the Inner Whatcom Waterway shoreline areas have fill and bulkheads located near or at the pierhead line. Most of these bulkheads would require replacement and/or substantial upgrades in order to maintain shoreline stability in these areas during and after dredging. Most docks and bulkheads along the Central Waterfront shoreline were constructed historically when the channel depth was shallower (18 feet below MLLW) and these docks and bulkheads would need to be either removed or replaced in order to accommodate channel dredging and future use.

- **Log Pond (Unit 4):** The Log Pond area was previously remediated as part of an Interim Action implemented in 2000. Subsequent monitoring has demonstrated the protectiveness of the subaqueous cap, and the effectiveness of habitat enhancement actions completed as part of that project. Actions in this area will be limited to enhancements to the shoreline edges of the cap, to ensure long-term stability of the cap edges. These enhancements are described in Appendix D of the FS Report.

- **Areas Offshore of ASB (Unit 5):** Exceedances of site-specific cleanup goals within Unit 5-B will be remediated using sub-aqueous capping. Appendix C of the FS Report describes the design concept for this area, including methods to maintain cap stability in a manner compatible with anticipated permitting requirements. The remaining areas of Unit 5 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas at this time. Additional evaluations of sediment stability will be conducted as part of engineering design. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels. Additional measures will be taken in this area only if engineering design evaluations indicate that such measures are required.

- **Areas Adjacent to BST (Unit 6):** The area south of the barge docks at the Bellingham Shipping Terminal (Units 6-B and 6-C) exceeds SMS cleanup levels. This area will be remediated using a deep-water sub-aqueous cap. Final water depths in this area will be greater than -18 feet MLLW in most areas, consistent with shoreline infrastructure and navigation uses historically conducted there. The cap will be constructed of coarse granular materials and will be designed to resist potential prop-wash erosion effects. The remaining portions of Unit 6 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **Starr Rock (Unit 7):** Sediments in the Starr Rock area currently comply with site-specific cleanup levels. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **ASB (Unit 8):** The ASB will be remediated using a thick sub-aqueous cap. Prior to cap placement, the treatment equipment (aerators, weirs, etc.) would be removed from the ASB. The conceptual design for the cap includes a nominal 3-foot layer of sandy capping material, with coarse materials placed in nearshore areas where wind-driven wave action may be significant. If the ASB is to be used for future stormwater/cooling water treatment, then the ASB would need to either remain connected to the current GP-owned outfall, or be provided with an alternate, appropriate-sized discharge outfall. Other modifications may be required depending on planned future uses.

## Sediment Disposal

Unlike Alternative 1, Alternative 2 involves substantial sediment dredging. The sediments dredged from the Waterway areas will be managed by containment in a new CAD area adjacent to the Cornwall Avenue landfill. The design concept estimates disposal of approximately 472,000 cubic yards of sediments dredged from the Outer and Inner Whatcom Waterway areas, and an additional 113,000 cubic yards of sediments dredged from Units 1A and 1B.

The Cornwall CAD site location was identified through the Bellingham Bay Pilot process, after evaluation of balancing criteria including costs, navigation, land use and habitat factors. The CAD location was incorporated into the range of remedial alternatives discussed in the 2000 RI/FS. The principal benefit of the Cornwall location as identified under the Pilot was the ability to create nearshore aquatic habitat using the CAD design approach. The geography of the area requires initial construction of an armored containment berm, prior to placement of the dredged materials within the site. Armoring of the outer edges of the berm is required to ensure long-term stability of the completed structure under anticipated wave energy and erosion conditions.

During filling of the CAD site, the containment berms would be constructed above tidal elevations. Sediments would be loaded into the facility and allowed to consolidate. The design and permitting for the CAD site would optimize sediment handling and offloading procedures to ensure compliance with water quality criteria near the CAD site location.

After the facility has been filled to design capacity, a capping layer of clean sediments would be placed to provide the final cap surface. The capping sediments will need to be appropriately sized and the cap edges will need to be appropriately constructed to resist wave-induced erosion.

Long-term monitoring and maintenance and institutional controls for the CAD facility would be required as part of the remedy. The construction of the CAD facility would also require coordination with the Cornwall Avenue Landfill and RG Haley cleanup sites, located adjacent to the CAD site location.

## Costs & Schedule

The probable costs of Alternative 2 are $34 million. In order of decreasing cost, this estimate addresses dredging and CAD site disposal of Waterway sediments, capping costs for the ASB and harbor areas, enhancements to the Log Pond shoreline, and provisions for long-term monitoring. Long-term monitoring costs are higher than under Alternative 1, because of the additional monitoring and periodic maintenance required for the completed CAD facility. The Alternative 2 costs listed above do not include costs of required mitigation of SEPA environmental impacts.

The construction activities in Alternative 2 can likely be completed within four construction seasons. With the exception of the ASB area, work activities would be confined to appropriate "fish windows." Because the ASB area is not connected to Bellingham Bay, the capping activities within the ASB will not necessarily be time-limited by the "fish windows."

Monitoring of capped and natural recovery areas will occur under Alternative 2. Monitoring will also be performed at the CAD site to ensure long-term effectiveness of the sediment containment.

### 4.3.2 Impacts, Benefits and Mitigation

Table 4-2 summarizes the environmental impacts, benefits, and mitigation associated with Alternative 2.

#### Geology, Water and Environmental Health

Alternative 2 produces net adverse impacts under the category including geology, water, and environmental health. Significant impacts, benefits, and potential mitigation requirements include the following:

- **Beneficial Impact – Sediment Cleanup:** Alternative 2 produces a beneficial impact through remediation and compliance with site cleanup levels consistent with MTCA and SMS requirements. Active cleanup is performed in the ASB Shoulder (Unit 5-B) area, the Barge Dock (Unit 6-B/C) and within the ASB. Monitored natural recovery and institutional controls are used to remediate other areas.

- **Mitigated Impacts – Construction Water Quality:** Alternative 2 involves extensive in-water construction activities associated with dredging, capping, and CAD site construction, operation and closure. The project likely will require 4 in-water construction seasons to complete, plus additional time to upgrade shoreline infrastructure. These construction activities will need to be mitigated to avoid adverse water quality impacts. Examples of potential mitigation actions include 1) completion of additional water quality review as part of project design and permitting (i.e., Section 401 Water Quality Certification), 2) use of best practices for design, permitting, contracting and construction of dredging activities to minimize water quality impacts and dredge residuals, 3) appropriate design and construction of the CAD site to minimize sediment release during construction, operation and post-closure of the facility, 4) water quality monitoring during construction, and 5) timing of CAD site actions to ensure completion of source control actions at the RG Haley site prior to CAD facility completion.

- **Beneficial Impact – Control of Sediment Resuspension:** Alternative 2 conducts active remediation by capping in Site Units 5-B, 6-B/C and in the Whatcom Waterway channel. These actions reduce the potential for future resuspension of contaminated sediments in navigation areas.

- **Adverse Impact – Shoreline Destabilization:** Alternative 2 includes deep dredging in the Inner Whatcom Waterway in order to comply with the dimensions of the 1960s industrial channel. This deep dredging will tend to further destabilize existing shorelines in this area. To avoid shoreline stability failures, the shoreline will need to be stabilized with new infrastructure compatible with the deep dredging patterns. Mitigation will be required, including the construction of hardened shoreline treatments including bulkheads and over-water wharves. The potential costs to construct this type of shoreline infrastructure have been estimated at $20 to $40 million for the Inner Whatcom Waterway. These costs are not included in the remediation cost estimates of Alternative 2. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. These costs are not included in the remediation cost estimates of Alternative 2.

- **Beneficial Impact – Log Pond Shoreline Stabilization:** Limited erosion has been noted in some shoreline edges of the Log Pond cap. Under Alternative 2, these erosional areas would be corrected, resulting in improved long-term performance of the Log Pond cap, and prevention of erosion and/or recontamination.

## Fish and Wildlife

Alternative 2 provides net beneficial impacts to fish and wildlife. Significant impacts, benefits and potential mitigation requirements include the following:

- **Beneficial Impacts – Environmental Protection:** Completion of site remediation provides protection of fish and wildlife from the potential effects of contaminated sediments.

- **Mitigated Impacts – Construction Disturbances:** Construction of Alternative 2 includes significant construction-related habitat disturbances. These disturbances will occur in several areas, including both dredging and cap areas and the site of the proposed Cornwall CAD site. Potential disturbances to fish and wildlife can be mitigated in these areas through the use of best practices for project design, permitting, and construction. Examples of best practices include 1) the timing of work activities during appropriate "fish windows" to avoid migration periods for juvenile salmonids or other sensitive species, 2) the use of construction equipment, dredge methods, cap materials and placement methods that minimize water quality impacts, noise and physical disturbances to aquatic habitats, and 3) completion of additional environmental reviews as part of project design and permitting. These measures are considered likely to mitigate the short-term habitat impacts associated with construction disturbances under Alternative 2.

- **Mitigated Impact – Inner Whatcom Waterway Nearshore Habitat:** Through dredging of the 1960s industrial channel, Alternative 2 eliminates existing emergent shallow-water habitats at the head and along the sides of the Inner Whatcom Waterway. These impacts would be mitigated by creation of new replacement habitat in alternative site areas (i.e., at the ASB shoulder and/or CAD site locations). Impact avoidance would require the use of alternative channel dimensions inconsistent with Alternative 2 (as in Alternative 4, 5 and 6). In addition to the direct impacts associated with the deep dredging, additional habitat impacts will be incurred during the construction of hardened shoreline infrastructure as necessary to stabilize shorelines and support the use and maintenance of the deep draft waterway uses in the Inner Whatcom Waterway under Alternative 2. Mitigation for these impacts would also occur through construction of new habitat at the ASB shoulder and/or CAD site locations.

- **Mitigated Impacts – Log Pond Shoreline Enhancements:** Construction of Alternative 2 will involve some in-water construction activities within the Log Pond to enhance the stability of area shorelines. These actions will involve a change in substrate conditions in limited areas, with placement of pebbles and beach gravels in some areas, and placement of stone groins for material retention in other areas. The actions are expected to result in minimal changes to the area of intertidal habitat. Potential adverse impacts associated with substrate changes in some areas are offset by other nearshore habitat gains under the alternative.

- **Beneficial Impact – Development of Nearshore Habitat:** Alternative 2 achieves a net habitat gain through the development of new nearshore habitat on the surface of the Cornwall CAD site. Consistent with the design concept presented in the 2000 FEIS, the elevation of the CAD site surface would be designed to support shallow-water habitat uses. Existing intermediate and deep-water habitats in the CAD site area would be converted to these shallow-water elevations upon completion and closure of the containment facility. New shallow-water habitat would also be created as part of the cap constructed within Unit 5B. The combined habitat benefits of the new CAD facility and the habitat bench in Unit 5B are likely to offset the habitat losses within the Inner Whatcom Waterway. However, the treatment of the Inner Whatcom Waterway will continue to represent a "gap" in nearshore habitat along the juvenile salmonid migration corridors (see Figure 1-3).

## Land Use, Navigation and Public Shoreline Access

Alternative 2 was initially designed to support industrial waterfront uses, consistent with historical land uses. However, waterfront land and navigation uses have changed. Alternative 2 conflicts with these changed uses. These conflicts can only be mitigated through the implementation of alternative channel treatments, as in project alternatives 4, 5, or 6. A summary of significant impacts, benefits, and mitigation for Alternative 2 is provided below:

- **Beneficial Impact – Outer Whatcom Waterway Navigation Benefits:** The shoreline infrastructure in the Outer Whatcom Waterway areas is similar to that shown in Figure 3-5 and currently supports deep draft navigation uses. Alternative 2 provides for dredging of deep draft areas of the Outer Whatcom Waterway, consistent with continued deep draft use capabilities. This alignment of dredging patterns with land use and navigation needs represents a benefit of Alternative 2.

- **Adverse Impact – Conflict with Inner Whatcom Waterway Land Uses:** The Inner Whatcom Waterway dredging plan and associated infrastructure requirements under Alternative 2 conflict with planned navigation and land uses. Land use and navigation planning for the Inner Whatcom Waterway area has focused on mixed-use redevelopment, with extensive enhancements to public shoreline access and transient moorage facilities. Significant interest has also been expressed for incorporating habitat restoration into shoreline land uses where such actions are compatible with land use and navigation needs. In contrast to this planned mixed-use redevelopment, Alternative 2 conducts the remediation of the Inner Whatcom Waterway using deep dredging consistent with deep-draft industrial uses. This dredging requires construction of hardened shorelines, bulkheads, and industrial shoreline infrastructure to stabilize the deep shorelines and allow maintenance and use of the target dredge depths. These actions result in conflicts with planned land uses for the Inner Whatcom Waterway. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. This approach would mitigate the land use conflict. These mitigation costs are not included in the remediation cost estimates of Alternative 2.

- **Beneficial Impacts – Habitat Preservation and Enhancement:** Alternative 2 would enhance habitat quality at the shoulder of the ASB (Unit 5-B). Preserving and enhancing habitat in this area is consistent with the Bellingham Bay Comprehensive Strategy and will benefit juvenile salmonids and other fish and wildlife species.

- **Adverse Impact – Conflict with Planned ASB Reuse:** The ASB has been identified in previous land use studies as the preferred location for development of a future environmentally sustainable marina with integrated public access and habitat enhancements. Alternative 2 remediates the ASB by capping and directly conflicts with this planned reuse. Mitigation of this impact would require remediation of the ASB as provided under other project alternatives (Alternatives 5, 6, 7 or 8).

## Air and Noise

Alternative 2 involves extensive construction activities associated with project dredging, capping, and CAD site construction activities. These activities will take place in most areas of the site. Potential impacts to area noise and air quality levels will need to be mitigated to avoid environmental impacts. However, mitigation can be accomplished through the use of best practices for project design, permitting, and construction.

Potential mitigation measures for noise impacts include 1) contractual requirements to avoid exceedances of ambient noise level restrictions, 2) contractor use of appropriate equipment including mufflers as required, and 3) use of appropriate work periods if required to comply with noise level restrictions.

Air quality impacts associated with capping activities could be experienced either through emissions from construction equipment, or through dust from temporary stockpiles of capping material prior to placement. These impacts can be mitigated through 1) contractual requirements to avoid impacts to air quality, 2) the use of appropriate equipment meeting applicable air quality control requirements, 3) the use of appropriate construction measures (e.g., wetting or covering of cap material stockpiles to control fugitive dust emissions, or 4) the direct supply of cap material by barges to the capping site. These mitigation measures should be incorporated during project design and permitting.

### Cultural Resources

Alternative 2 involves extensive dredging activities, including dredging at the head of the Whatcom Waterway in the area near Citizens Dock. This was an area that was identified during previous archaeological assessment activities as potentially containing undisturbed historical or cultural resources. Potential measures to mitigate impacts to these resources would need to be developed during project design and permitting. This would likely be performed as part of the Section 106 consultations as part of Army Corps of Engineers permitting. This consultation would also cover other site areas, though the potential for presence of undisturbed cultural or historical resource in these other areas is much lower.

# 4.4 Project Alternative 3

Alternative 3 uses a combination of institutional controls, monitored natural recovery, and containment to achieve compliance with SMS cleanup levels. Alternative 3 uses dredging to remove sediments from the Whatcom Waterway as necessary to allow use and maintenance of the 1960s federal navigation channel. These sediments are managed by creating a nearshore fill within the majority of the ASB. The portion of the ASB not required for the fill would be retained for stormwater or cooling water treatment uses.

## 4.4.1 Cleanup Description

The design concept for Alternative 3 is shown in Figure 4-4. A detailed description of the alternative is provided below.

### Actions by Site Area

Cleanup Alternative 3 represents a modification of the cleanup Alternative "J" evaluated in a previous Supplemental Feasibility Study (Anchor, 2002) after closure of the Pulp Mill and Chlor-Alkali Plant. The original evaluation of this remedial alternative was based on continued industrial uses of the ASB and upland properties adjacent to the Whatcom Waterway site. These land uses are no longer applicable. A description of Alternative 3 by site unit follows:

- **Outer Whatcom Waterway (Unit 1):** Under Alternative 3, the outer portion of the waterway would be dredged to a minimum depth of 35 feet below MLLW. Where technically feasible, the dredging depths would be increased to allow dredging to the base of the impacted sediments in the channel areas. Anticipated dredge depths vary from 35 feet below MLLW to about 41 feet below MLLW. Under this alternative, dredging from the Outer Whatcom Waterway areas could potentially be conducted using either hydraulic or mechanical dredging. Hydraulic dredging could provide the most cost-effective initial placement of the sediments within the ASB, and may potentially reduce turbidity levels at the point of dredging. However, hydraulic dredging is not well suited for areas containing woody debris, as expected in the Waterway. Further, hydraulic dredging with a cutter-head dredge can leave significant dredging residuals, up to a foot in thickness. Finally, hydraulic dredging would create large quantities of dredge slurry and entrained water. That contaminated water would ultimately be discharged back to Bellingham Bay. Assuming typical operating parameters (i.e., a controlled 2,000 cubic yard per day dredge production rate, a 10:1 water to sediment ratio and either one or two dredge units operating simultaneously) the hydraulic dredging would result in discharge of between 4 million and 8 million gallons per day of produced dredge waters to the Bay. Mechanical dredging and hydraulic dredging would need to be evaluated during remedial design to optimize project design and ensure protection of water quality during the dredging, both at the point of dredging and at the point of disposal for any generated waters. Sediments dredged from the waterway would be contained within the ASB fill as described below.

- **Inner Whatcom Waterway (Units 2 & 3):** Under Alternative 3, sediment dredging would be performed within the Inner Whatcom Waterway as necessary to provide for future use and maintenance of the federal navigation channel to the head of the waterway. The 1960s federal channel boundaries specify a water depth of 30 feet below MLLW from the BST area to Maple Street. A depth of 18 feet is specified from Maple Street to the head of the waterway. In the deeper portion of the waterway, the dredging cut would be established at depths at least 35 feet below MLLW. This would remove sediments where technically feasible, and would provide sufficient over-depth to allow residual sediments to be capped without impeding future maintenance of the federal channel. The design concept assumes a cap thickness of 3 feet over dredged areas with residual subsurface sediment impacts. Due to historical encroachment of the shoreline on the federal channel boundaries, many of the Inner Whatcom Waterway shoreline areas have fill and bulkheads up to or near to the pierhead line. Most of these bulkheads would require replacement and/or substantial upgrades in order to maintain shoreline stability in these areas during and after dredging. Docks may also have to be upgraded or replaced as described in Alternative 2 in order to accommodate channel dredging and future use. After dredging, the effective water depth (water depth at the pierhead line) will vary with location along the shoreline. The effective water depth will be controlled mostly by the type of shoreline infrastructure (i.e., nearshore fill, docks, and bulkheads) that is established there. Without substantial infrastructure investments, the effective water depth for the Inner Whatcom Waterway will be significantly less in most areas than the federal channel project depth. The remedial costs of this alternative address only sediment removal. The costs of the shoreline infrastructure required to improve the effective waterway depth would be borne by area redevelopment actions.

- **Log Pond (Unit 4):** The Log Pond area was previously remediated as part of an Interim Action implemented in 2000. Subsequent monitoring has demonstrated the protectiveness of the subaqueous cap, and the effectiveness of habitat enhancement actions completed as part of that project. Actions in this area will be limited to enhancements to the shoreline edges of the cap, to ensure long-term stability of the cap edges. These enhancements are described in Appendix D of the FS report.

- **Areas Offshore of ASB (Unit 5):** Exceedances of site-specific cleanup goals within Unit 5-B will be remediated using sub-aqueous capping. Appendix C of the FS Report describes the design concept for this area, including methods to maintain cap stability in a manner compatible with anticipated permitting requirements. The remaining areas of Unit 5 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas at this time. Additional evaluations of sediment stability will be conducted as part of engineering design. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels. Additional measures will be taken in this area only if engineering design evaluations indicate that such measures are required.

- **Areas Adjacent to BST (Unit 6):** The area south of the barge docks at the Bellingham Shipping (Units 6-B and 6-C) exceeds SMS cleanup levels. This area will be remediated using a deep-water sub-aqueous cap. Final water depths in this area will be greater than -18 feet MLLW in most areas, consistent with shoreline infrastructure and navigation uses historically conducted there. The cap will be constructed of coarse granular materials and will be designed to resist potential prop-wash erosion effects. The remaining portions of Unit 6 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **Starr Rock (Unit 7):** Sediments in the Starr Rock area currently comply with site-specific cleanup levels. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **ASB (Unit 8):** Under Alternative 3, the ASB sludges would be contained within the existing ASB. Most sludges would simply be buried beneath the nearshore fill. However, the Alternative assumes that the sludges located in the outer portion of the ASB (the area not required for a nearshore fill) would be dredged and consolidated within the fill area. Construction sequencing would involve initial lowering of the water level of the ASB, followed by the removal of the wastewater treatment equipment (aerators, weirs, etc.). Dredging of sludges from the future edge of the nearshore fill would then be conducted. A berm would be constructed along this alignment. Finally, the remaining sludges would be dredged from the area outside of the berm, for consolidation within the new fill area. Because construction within the ASB would disrupt the bentonite sealant present along the bottom and sides of the ASB, some additional measures (in addition to lowering of the water level of the ASB during construction) may be required to prevent significant water leakage through the berm during and after construction. These actions may include driving of sheet-piling, placement of new bentonite sealant, or other measures. Some residual sludges would likely remain in the dredged area of the ASB, and these would be managed by sediment capping.

## Sediment Disposal

Under Alternative 3, the sediments dredged from the Waterway areas will be managed by containment in nearshore fill constructed in a portion of the ASB. The design concept estimates disposal of approximately 472,000 cubic yards of sediments dredged from the Outer and Inner Whatcom Waterway areas, and an additional 113,000 cubic yards of sediments dredged from Units 1A and 1B. Approximately 71,000 cubic yards of ASB sludges in the outer portion of the ASB would be consolidated in the fill area, along with the dredged sediments. Additional materials would be used to construct the containment berm within the ASB, and to cap the facility after placement of dredged sediments.

The principal remedial benefit associated with the ASB fill site is that the main ASB berm already exists, and does not need to be constructed. Secondly, the use of the ASB provides for consolidation of the ASB sludges as well as the dredged sediments from the Waterway.

Whether the Waterway dredging is conducted using hydraulic or mechanical dredging, the existing berms of the ASB facility would be maintained largely in their current configuration. A new berm would be constructed within the interior of the facility as described above.

Previous leachability studies conducted as part of the 2000 RI/FS and the PRDE investigation report (Anchor 2003) included evaluation of contaminant mobility under various conditions. Mobility of mercury was lowest in those tests under anoxic conditions. The design of the fill would place the dredged materials and ASB sludges below the elevation at which groundwater levels are anticipated to stabilize after facility construction. The elevated TOC content of the sediments and ASB sludges, combined with long-term groundwater saturation would tend to retain anoxic conditions within the impacted portion of the fill. Sediments from Unit 1A and 1B would be placed in upper portions of the fill, and clean sediments and/or soils would be placed on top of the final fill as a capping layer. The design and construction of the facility would provide for sediment and sludge consolidation.

The land created by the fill would be subject to further consolidation over time, due to decomposition of high-organic materials in the ASB sludges and the decomposition of woody materials in waterway sediments. This process would be similar to the long-term settlement that occurs in solid waste landfills. Any future use of the property would need to allow for such settlement to occur. Pile-supported foundations would likely be required for most buildings, involving penetration of the pilings through the fill materials and into underlying sandy soils. Water quality evaluations conducted during design and permitting would need to address water quality issues within the fill, to ensure long-term protection of surface waters. If maintenance of the bentonite sealing layer within the fill is required for long-term surface water protection, then penetration of this layer with foundation pilings could be subject to significant limitations or could be prohibited altogether. Future development of enclosed structures within the fill area would also be subject to requirements for under-building methane-control systems, similar to those used for buildings constructed on peat deposits or for buildings on or adjacent to municipal landfills.

Long-term monitoring and maintenance and institutional controls for the nearshore fill would be required as part of the remedy.

The construction of the nearshore fill would need to be coordinated with the activities at the adjacent Central Waterfront site. This would mainly involve ensuring that construction and any future reuse of the fill area does not adversely impact groundwater conditions within the Central Waterfront site.

## Costs and Schedule

The probable costs of Alternative 3 are approximately \$34 million. In order of decreasing cost, this estimate address dredging and ASB site disposal of Waterway sediments, preparation and completion of the ASB facility, capping costs for harbor areas, enhancements to the Log Pond shoreline, and provisions for long-term monitoring. Long-term monitoring costs include provisions for groundwater and vapor monitoring associated with the fill area. The costs for Alternative 3 do not include the costs required to mitigate for SEPA environmental impacts.

The construction activities in Alternative 3 can likely be completed within three construction seasons. The range of construction time requirements is 2 to 4 years, depending on dredging rates and construction sequencing. Higher dredging rates reduce the restoration time, but are logistically more difficult to maintain. For hydraulic dredging, use of high production rates significantly increases the rates of water generation requiring treatment and discharge to Bellingham Bay. With the exception of the initial and final work within ASB area, work activities would be confined to appropriate "fish windows." Because the ASB area is not connected to Bellingham Bay, some of the initial ASB preparation and the final capping activities within the ASB will not necessarily be time-limited by the "fish windows."

## 4.4.2 Impacts, Benefits and Mitigation

Table 4-2 summarizes the environmental impacts, benefits, and mitigation associated with Alternative 3.

### Geology, Water and Environmental Health

Alternative 3 produces net adverse impacts under the environmental category including geology, water, and environmental health. Significant impacts, benefits, and potential mitigation requirements include the following:

- **Beneficial Impact – Sediment Cleanup:** Alternative 3 produces a beneficial impact through remediation and compliance with site cleanup levels consistent with MTCA and SMS requirements. Active cleanup is performed in the ASB Shoulder (Unit 5-B) area, the Barge Dock (Unit 6-B/C), the Inner and Outer Whatcom Waterway areas, and within the ASB. Monitored natural recovery and institutional controls are used to remediate other areas.

- **Mitigated Impacts – Construction Water Quality:** Alternative 3 involves extensive in-water construction activities associated with dredging, capping, and ASB fill construction, operation and closure. The project likely will require 3 in-water construction seasons to complete. These construction activities will need to be mitigated to avoid adverse water quality impacts. Examples of potential mitigation actions include 1) completion of additional water quality review as part of project design and permitting (i.e., Section 401 Water Quality Certification), 2) use of best practices for design, permitting, contracting and construction of dredging activities to minimize water quality impacts and dredge residuals, 4) water quality monitoring during construction, and 5) further evaluation of contaminant leachability and potential measures to protect against contaminant migration via groundwater to adjacent surface waters during long-term care of the completed fill. Alternative 3 may provide the ability to use hydraulic dredging for management of some sediments. Hydraulic dredging can produce lower turbidity levels at the point of dredging than many mechanical dredging methods. However, further evaluations would need to be conducted to determine potential impacts to water quality and associated treatment requirements for produced dredge waters, because of the high production of impacted dredged waters associated with hydraulic dredging.

- **Beneficial Impact – Control of Sediment Resuspension:** Alternative 3 conducts active remediation by capping in Site Units 5-B, 6-B/C and dredging and capping in the Whatcom Waterway channel. These actions reduce the potential for future resuspension of contaminated sediments in navigation areas.

- **Adverse Impact – Shoreline Destabilization:** Alternative 3 includes deep dredging in the Inner Whatcom Waterway in order to comply with the dimensions of the 1960s industrial channel. This deep dredging will tend to further destabilize existing shorelines in this area. To avoid shoreline stability failures, the shoreline will need to be stabilized with new infrastructure compatible with the deep dredging patterns. Mitigation will be required, including the construction of hardened shoreline treatments including bulkheads and over-water wharves. The potential costs to construct this type of shoreline infrastructure has been estimated at $20 to $40 million for the Inner Whatcom Waterway. These costs are not included in the remediation cost estimates of Alternative 3. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. These costs are not included in the remediation cost estimates of Alternative 3.

- **Beneficial Impact – Log Pond Shoreline Stabilization:** Limited erosion has been noted in some shoreline edges of the Log Pond cap. Under Alternative 3, these erosional areas would be corrected, resulting in improved long-term performance of the Log Pond cap, and prevention of erosion and/or recontamination.

- **Mitigated Impact – ASB Fill Settlement & Use Restrictions:** The reuse options for the ASB fill will be subject to geotechnical and environmental use restrictions. Geotechnical restrictions will be associated with primary and secondary settlement of the completed fill. This settlement is similar to the settlement that occurs with municipal landfills and will affect the construction methods for any buildings to be placed on the fill. Secondly, provisions to maintain groundwater quality could prohibit, or at least minimize, the use of foundation pilings to avoid compromising the bentonite lining of the ASB and increasing the migration potential of impacted fill leachate. The nature of the final use restrictions will be determined in future design and permitting activities and will be subject to further environmental review by Ecology and permitting agencies. Any planning for reuse of the fill area developed under Alternative 3 must take into account the effect of such restrictions.

## Fish and Wildlife

Alternative 3 results in net adverse impacts to fish and wildlife. Under alternative 3 significant impacts, benefits and potential mitigation requirements include the following:

- **Beneficial Impacts – Environmental Protection:** Completion of site remediation provides protection of fish and wildlife from the potential effects of contaminated sediments.

- **Mitigated Impacts – Construction Disturbances:** Construction of Alternative 3 includes significant construction-related habitat disturbances. These disturbances will occur in several areas, including the dredging and cap areas. Potential disturbances to fish and wildlife must be mitigated in these areas through the use of best practices for project design, permitting and construction. Examples of best practices include 1) the timing of work activities to avoid migration periods for juvenile salmonids or other sensitive species, 2) the use of construction equipment, dredge methods, cap materials and placement methods that minimize water quality impacts, noise and physical disturbances to aquatic habitats, and 3) completion of additional environmental reviews as part of project design and permitting. These measures are considered likely to mitigate the short-term habitat impacts associated with construction disturbances under Alternative 3.

- **Adverse Impact – Inner Whatcom Waterway Nearshore Habitat:** Through dredging of the 1960s industrial channel, Alternative 3 eliminates existing emergent shallow-water habitats at the head and along the sides of the Inner Whatcom Waterway. These impacts likely exceed the level that will be mitigated by creation of new replacement habitat in alternative site areas (i.e., at the ASB shoulder). Impact avoidance would require the use of alternative channel dimensions (as in Alternative 4, 5 and 6). In addition to the direct impacts associated with the deep dredging, additional habitat impacts will be incurred during the construction of hardened shoreline infrastructure as necessary to stabilize shorelines and support the use and maintenance of the deep-draft waterway uses in the Inner Whatcom Waterway under Alternative 3. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. This approach would mitigate the habitat losses associated with deep dredging in the Inner Waterway. These mitigation costs are not included in the remediation cost estimates of Alternative 3.

- **Mitigated Impacts – Log Pond Shoreline Enhancements:** Construction of Alternative 3 will involve some in-water construction activities within the Log Pond to enhance the stability of area shorelines. These actions will involve a change in substrate conditions in limited areas, with placement of pebbles and beach gravels in some areas, and placement of stone groins for material retention in other areas. The actions are expected to result in minimal changes to the area of intertidal habitat. However, potential adverse impacts associated with substrate changes may require mitigation through habitat gains in other areas under the alternative.

- **Beneficial Impact – Development of New Habitat:** Alternative 3 includes development of a new habitat bench within Unit 5B. This habitat benefit is significant, but is likely offset by the other habitat impacts associated with completion of the project. The treatment of the Inner Whatcom Waterway will continue to represent a "gap" in nearshore habitat along the salmonid migration corridors (see Figure 1-3) which is not addressed by development of the new habitat bench.

## Land Use, Navigation and Public Shoreline Access

As with Alternative 2, Alternative 3 was initially designed to support industrial waterfront uses, consistent with land uses that predominated in the 1960s. The same conflicts with area zoning and planned land uses that were discussed for Alternative 2 are applicable to Alternative 3. A summary of significant impacts, benefits, and mitigation for Alternative 3 is provided below:

- **Beneficial Impact – Outer Whatcom Waterway Navigation Benefits:** The shoreline infrastructure in the Outer Whatcom Waterway areas is similar to that shown in Figure 3-5 and currently supports deep draft navigation uses. Alternative 3 provides for dredging of deep draft areas of the Outer Whatcom Waterway, consistent with continued deep draft use capabilities. This alignment of dredging patterns with land use and navigation needs represents a benefit of Alternative 3.

- **Adverse Impact – Conflict with Inner Whatcom Waterway Land Uses:** The Inner Whatcom Waterway dredging plan and associated infrastructure requirements under Alternative 3 conflict with planned navigation and land uses. Land use and navigation planning for the Inner Whatcom Waterway area has focused on mixed-use redevelopment, with extensive enhancements to public shoreline access and transient moorage facilities. Significant interest has also been expressed for incorporating habitat restoration into shoreline land uses where such actions are compatible with land use and navigation needs. In contrast to this planned mixed-use redevelopment, Alternative 3 conducts the remediation of the Inner Whatcom Waterway using deep dredging consistent with deep-draft industrial uses. This dredging requires construction of hardened shorelines, bulkheads and industrial shoreline infrastructure to stabilize the deep shorelines and allow maintenance and use of the target dredge depths. These actions result in conflicts with planned land uses for the Inner Whatcom Waterway. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. This approach would mitigate the land use conflict. These mitigation costs are not included in the remediation cost estimates of Alternative 3.

- **Adverse Impact – Conflict with Planned ASB Reuse:** The ASB has been identified in previous land use studies as the preferred location for development of a future environmentally sustainable marina with integrated public access and habitat enhancements. Alternative 3 remediates the ASB by constructing a nearshore fill within the ASB for management of sludges and sediments dredged from other site areas. This cleanup approach directly conflicts with the planned aquatic reuse of the ASB. Mitigation of this impact would require remediation of the ASB as provided under other project alternatives (Alternatives 5, 6, 7 or 8).

## Air and Noise

Alternative 3 involves extensive construction activities associated with project dredging, capping and fill site construction activities. These activities will take place in most areas of the site. Potential impacts to area noise and air quality levels will need to be mitigated to avoid environmental impacts. However, mitigation can be accomplished through the use of best practices for project design, permitting and construction.

Potential mitigation measures for noise impacts include 1) contractual requirements to avoid exceedances of ambient noise level restrictions, 2) contractor use of appropriate equipment including mufflers as required, and 3) use of appropriate work periods if required to comply with noise level restrictions.

Air quality impacts associated with capping activities could be experienced either through emissions from construction equipment, or through dust from temporary stockpiles of capping material prior to placement. These impacts can be mitigated through 1) contractual requirements to avoid impacts to air quality, 2) the use of appropriate equipment meeting applicable air quality control requirements, 3) the use of appropriate construction measures (e.g., wetting or covering of cap material stockpiles to control fugitive dust emissions, or 4) the direct supply of cap material by barges to the capping site. These mitigation measures should be incorporated during project design and permitting.

### Cultural Resources

Alternative 3 involves extensive dredging activities, including dredging at the head of the Whatcom Waterway in the area near Citizens Dock. This was an area that was identified during previous archaeological assessment activities as potentially containing undisturbed historical or cultural resources. Potential measures to mitigate impacts to these resources would need to be developed during project design and permitting. This would likely be performed as part of the Section 106 consultations as part of Army Corps of Engineers permitting. This consultation would also cover other site areas, though the potential for presence of undisturbed cultural or historical resource in these other areas is much lower.

# 4.5 Project Alternative 4

Cleanup Alternative 4 uses removal and upland disposal technology, in addition to institutional controls, monitored natural recovery and containment to comply with SMS cleanup levels. The alternative uses capping in-place for management of the ASB sludges.

## 4.5.1 Cleanup Description

The design concept for Alternative 4 is shown in Figure 4-5. A detailed description of the alternative follows.

### Actions by Site Area

Cleanup actions are described below by site unit. Dredging activities within the Whatcom Waterway are targeted on appropriate areas to support a multi-purpose Waterway concept, including a mix of deep-draft navigation, public access, transient moorage, and habitat enhancement uses. Sediments dredged from the Waterway are managed by upland disposal at appropriately-permitted off-site facilities.

- **Outer Whatcom Waterway (Unit 1):** Under Alternative 4, the outer portion of the waterway would be dredged to a depth of approximately 35 feet below MLLW. The sediments removed during this dredging would be barged to an offload facility within Port-owned property. The sediments would be transferred to lined railcars for transportation to an appropriately-permitted offsite disposal facility. The cost estimates are based on the use of Subtitle D permitted landfills that can accept wet sediments for reuse as daily cover. Other disposal facilities that have appropriate environmental permits may be used, subject to applicable regulations and logistical considerations. The costs for sediment transportation and disposal under this alternative were based on pricing for eastern Washington and eastern Oregon landfills. This does not preclude potential use of alternate locations subject to final remedy design, permitting, and contractor discretion. After removal of sediments to -35 feet MLLW, a thick sediment cap would be placed over residual impacted sediments. The cap would be designed to resist erosive forces of prop wash, and to minimize the potential for aquatic wildlife exposures. Based on previous sediment testing, the sediments from Units 1A and 1B appear to be suitable for beneficial reuse or PSDDA disposal, subject to final testing and suitability determinations. These sediments could potentially be reused as part of the project for capping subgrade within the Inner Whatcom Waterway. However, the fine particle size distribution within the Unit 1A/1B sediments makes this use subject to logistical and long-term stability considerations. The Alternative 4 cost estimate assumes that Unit 1A and 1B sediments that are dredged are managed by open water disposal consistent with PSDDA program requirements. Mechanical dredging methods would likely be used for the Outer Whatcom Waterway area, as hydraulic dredging is impracticable without a large area for management of produced dredge waters and for separating entrained waters from dredge materials. Detailed dredging and construction procedures would be determined in project design and permitting.

- **Inner Whatcom Waterway (Units 2 & 3):** The design concept included in Alternative 4 assumes that the majority of the Inner Whatcom Waterway is to be managed for effective water depths of between 18 feet and 22 feet. This water depth range provides for navigation opportunities consistent with the mixed-use zoning of the waterfront properties. The central portion of the waterway is dredged to depths at least 5 feet below the planned effective water depth. A sediment cap is then applied over any residual sediments, with the cap grading from a minimum thickness of 3 feet, to a maximum thickness of 6 feet near the Log Pond. Shoreline slopes would be stabilized using appropriately designed side-slopes and materials that maximize nearshore habitat quality and quantity, while maintaining stability and providing for appropriate navigation needs within the Waterway. Under Alternative 4, the emergent tideflats at the head of the waterway are preserved, and shallow-water habitat areas along the sides of the waterway are preserved and enhanced.

- **Log Pond (Unit 4):** The Log Pond area was previously remediated as part of an Interim Action implemented in 2000. Subsequent monitoring has demonstrated the protectiveness of the subaqueous cap, and the effectiveness of habitat enhancement actions completed as part of that project. Actions in this area will be limited to enhancements to the shoreline edges of the cap, to ensure long-term stability of the cap edges. These enhancements are described in Appendix D of the FS Report.

- **Areas Offshore of ASB (Unit 5):** Exceedances of site-specific cleanup goals within Unit 5-B will be remediated using sub-aqueous capping. Appendix C of the FS Report describes the design concept for this area, including methods to maintain cap stability in a manner compatible with anticipated permitting requirements. The remaining areas of Unit 5 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas at this time. Additional evaluations of sediment stability will be conducted as part of engineering design. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels. Additional measures will be taken in this area only if engineering design evaluations indicate that such measures are required.

- **Areas Adjacent to BST (Unit 6):** The area south of the barge docks at the Bellingham Shipping (Units 6-B and 6-C) exceeds of SMS cleanup levels. This area will be remediated using a deep-water sub-aqueous cap. Final water depths in this area will be greater than -18 feet MLLW in most areas, consistent with shoreline infrastructure and navigation uses historically conducted there. The cap will be constructed of coarse granular materials and will be designed to resist potential prop-wash erosion effects. The remaining portions of Unit 6 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **Starr Rock (Unit 7):** Sediments in the Starr Rock area currently comply with site-specific cleanup levels. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **ASB (Unit 8):** As with Alternatives 1 and 2, the ASB will be remediated using a thick sub-aqueous cap.

## Sediment Disposal

Sediments removed from Waterway areas under this Alternative will be managed by disposal at a Subtitle D upland disposal facility. Subtitle D facilities are commercially available, and are designed and permitted for management of solid waste. The design of Subtitle D facilities includes a liner, a cap, a monitoring network, and institutional controls and financial assurance provisions under state and federal solid waste regulations.

The design concept for Alternative 4 estimates disposal of approximately 68,000 cubic yards of sediments dredged from the Outer and Inner Whatcom Waterway areas at upland disposal sites. An additional 113,000 cubic yards of sediments dredged from Units 1A and 1B would be managed by beneficial reuse or PSDDA disposal.

Options for transportation of dredged materials to upland disposal sites include barge, truck, and rail. Barge transportation can utilize alternate offloading locations located away from the site. Such offloading facilities exist in Seattle, Vancouver B.C. and elsewhere. The sediments are generally then transferred to truck or rail for final shipment to the disposal facility. Truck transportation is commonly used for small sediment volumes. Multiple intermodal yards exist around the region where truck containers can be transloaded for final rail shipment to the disposal site. However, for large sediment volumes, truck transportation results in additional traffic burdens and is less fuel efficient than rail transportation. The design concept and cost estimate assumes the placement of temporary rail improvements at the former GP mill site, and shipment of sediments directly from the site to the upland disposal site by rail. Stormwater management and "surge" stockpile areas are included in the project cost assumptions.

## Costs and Schedule

The probable costs of Alternative 4 are approximately $21 million. The costs of Alternative 4 are the second lowest of all of the evaluated alternatives. In order of decreasing cost, this estimate addresses dredging and upland disposal of Whatcom Waterway sediments, capping costs for the ASB and harbor areas, enhancements to the Log Pond shoreline, and provisions for long-term monitoring.

The in-water construction activities in Alternative 4 can likely be completed within a single construction season. With the exception of the ASB area, and initial preparation and final demobilization of the upland sediment offload area, work activities would be confined to appropriate "fish windows". Because the ASB area is not connected to Bellingham Bay, the capping activities within the ASB will not necessarily be time-limited by the "fish windows."

Monitoring of capped and natural recovery areas will occur under Alternative 4. Because natural recovery is only applied in areas that have already achieved compliance with cleanup standards, additional restoration time would not be required.

## 4.5.2 Impacts, Benefits and Mitigation

Table 4-2 summarizes the environmental impacts, benefits, and mitigation associated with Alternative 4.

### Geology, Water and Environmental Health

Alternative 4 includes net beneficial impacts in the category including geology, water, and environmental health. Significant impacts, benefits, and potential mitigation requirements include the following:

- **Beneficial Impact – Sediment Cleanup:** Alternative 4 produces a beneficial impact through remediation and compliance with site cleanup levels consistent with MTCA and SMS requirements. Active cleanup is performed in the ASB Shoulder (Unit 5-B) area, the Barge Dock (Unit 6-B/C), the Inner and Outer Whatcom Waterway areas, and within the ASB. Monitored natural recovery and institutional controls are used to remediate other areas.

- **Mitigated Impact – Construction Water Quality:** Alternative 4 involves in-water construction activities that can likely be completed within one or at most two construction seasons. This alternative has a lower potential for water quality impacts than any alternatives except for Alternative 1 and the No Action Alternative. To minimize the potential for adverse water quality impacts, these construction activities will need to be mitigated to avoid adverse water quality impacts. Examples of potential mitigation actions include 1) completion of additional water quality review as part of project design and permitting (i.e., Section 401 Water Quality Certification), 2) use of best practices for design, permitting, contracting, and construction of dredging activities to minimize water quality impacts and dredge residuals, and 3) water quality monitoring during construction.

- **Beneficial Impact – Control of Sediment Resuspension:** Alternative 4 conducts active remediation by capping and dredging in the impacted harbor areas and in the Whatcom Waterway channel. These actions reduce the potential for future sediment resuspension in these areas.

- **Beneficial Impact – Channel Updating & Stabilization:** Alternative 4 includes updating of Whatcom Waterway channel dimensions, consistent with plans for a locally-managed multi-purpose channel. Under this alternative, dredging activities within the waterway are graded, to provide deep draft use areas in the Outer Whatcom Waterway, and to address planned land uses within the Inner

Whatcom Waterway. Because the infrastructure exists in the Outer Whatcom Waterway to accommodate deep draft uses, no impacts are associated with deep dredging in that location. For the Inner Whatcom Waterway, Alternative 4 avoids the adverse impacts associated with destabilization of the existing shorelines under Alternatives 2 and 3. Rather, Alternative 4 provides for effective water depths of between 18 and 22 feet, consistent with the needs for transient moorage and planned uses for the Inner Whatcom Waterway area. Additionally, Alternative 4 provides for stabilization of the side-slopes of the Inner Whatcom Waterway without requiring extensive use of hardened shoreline infrastructure. Alternative 4 allows for shorelines to be softened using slope treatments similar to those shown in Figure 3-6, without adversely impacting navigation opportunities. This shoreline stabilization approach provides significant benefits to habitat conditions within the Inner Whatcom Waterway, as described below.

- **Beneficial Impact – Log Pond Shoreline Stabilization:** Limited erosion has been noted in some shoreline edges of the Log Pond cap. Under Alternative 4, these erosional areas would be corrected, resulting in improved long-term performance of the Log Pond cap, and prevention of erosion and/or recontamination.

## Fish and Wildlife

Alternative 4 results in net beneficial impacts to fish and wildlife. Significant impacts, benefits, and potential mitigation requirements relative to fish and wildlife include the following:

- **Beneficial Impacts – Environmental Protection:** Completion of site remediation provides protection of fish and wildlife from the potential effects of contaminated sediments.

- **Mitigated Impact – Construction Disturbances:** Construction disturbances of Alternative 4 are significant, but are less than under Alternatives 2 and 3. These short-term disturbances will occur in the dredging and cap areas shown in Figure 4-5. Potential disturbances to fish and wildlife must be mitigated in these areas through the use of best practices for project design, permitting and construction. Examples of best practices include 1) the timing of work activities to avoid migration periods for juvenile salmonids or other sensitive species, 2) the use of construction equipment, dredge methods, cap materials and placement methods that minimize water quality impacts, noise and physical disturbances to aquatic habitats, and 3) completion of additional environmental reviews as part of project design and permitting. These measures are considered likely to mitigate the short-term habitat impacts associated with construction disturbances under Alternative 4.

- **Beneficial Impact – Inner Whatcom Waterway Habitat:** Alternative 4 preserves and enhances existing nearshore aquatic habitats at the head and along the sides of the Inner Whatcom Waterway. The shoreline stabilization and channel patterns provided under Alternative 4 incorporate habitat enhancement in their design. The alternatives provides for large stretches of continuous habitat enhancement along important salmonid migration corridors, and provides habitat connectivity with recent restoration actions completed by the City in the Whatcom Creek Estuary and Maritime Heritage Park (see Figure 1-2).

- **Mitigated Impacts – Log Pond Shoreline Enhancements:** Construction of Alternative 4 will involve some in-water construction activities within the Log Pond to enhance the stability of area shorelines. These actions will involve a change in substrate conditions in limited areas, with placement of pebbles and beach gravels in some areas, and placement of stone groins for material retention in other areas. The actions are expected to result in minimal changes to the area of intertidal habitat. However, potential adverse impacts associated with substrate changes may require mitigation through habitat gains in other areas under the alternative.

- **Beneficial Impact – Development of New Habitat:** Alternative 4 includes development of a new habitat bench within Unit 5B. This is likely to result in a net beneficial impact for fish and wildlife in conjunction with other project actions of Alternative 4.

## Land Use, Navigation and Public Shoreline Access

Alternative 4 is the first of the evaluated alternatives that specifically addresses local land use and navigation plans for the Whatcom Waterway. This provides a beneficial impact under this Alternative, supporting waterfront revitalization efforts. However, the capping of the ASB under Alternative 4 offsets these benefits and results in a net impact to land use, navigation and public shoreline access under Alternative 4. A summary of significant impacts, benefits, and mitigation for Alternative 4 is provided below:

- **Beneficial Impacts – Outer Whatcom Waterway Navigation:** Like Alternatives 2 and 3, Alternative 4 supports continued deep draft navigation capabilities in the Outer Whatcom Waterway where the shoreline infrastructure currently supports deep draft navigation uses. This alignment of dredging patterns with land use and navigation needs represents a benefit of Alternative 4.

- **Beneficial Impact – Inner Whatcom Waterway Land Use:** Alternative 4 includes updating of Whatcom Waterway channel dimensions, consistent with plans for a locally-managed multi-purpose channel. Alternative 4 provides for effective water depths of between 18 and 22 feet, consistent with historical authorized depths in the Inner Whatcom Waterway, and consistent with the needs for transient moorage and other uses planned for the Inner Whatcom Waterway area. Additionally, Alternative 4 provides for stabilization of the side-slopes of the Inner Whatcom Waterway without requiring extensive use of hardened shoreline infrastructure. Alternative 4 allows for shorelines to be softened using slope treatments similar to those shown in Figure 3-6, without adversely impacting navigation opportunities. Infrastructure costs are reduced while simultaneously maximizing land use flexibility and improving both habitat conditions and navigation opportunities. Effective water depths within the Inner Whatcom Waterway will be between 18 and 22 feet under this Alternative. Deeper draft vessels can be accommodated in the Outer Whatcom Waterway near the Bellingham Shipping Terminal. The navigation uses for the Inner Whatcom Waterway would accommodate transitional uses by tug boats and barges. Compatible navigation uses consistent with the long-term redevelopment of the waterfront include access by recreational vessels, whale watching boats, intermediate-draft institutional vessels (i.e., research boats), sailing ships (i.e., most "Tall Ships Festival" vessels) and most passenger-only ferries. Alternative 4 stabilizes Inner Whatcom Waterway shoreline without triggering requirements for substantial new shoreline infrastructure. This substantially reduces the mitigation costs and land use and habitat impacts associated with preceding Alternatives 2 and 3.

- **Adverse Impact – Conflicts with planned ASB Reuse:** The ASB has been identified in previous land use studies as the preferred location for development of a future environmentally sustainable marina. Alternative 4 does not remove contaminated sludges from the ASB. The capping of the ASB sludges in place would prevent future use of the area for development of an environmentally sustainable marina with integrated public access and habitat enhancements. This conflict between cleanup and planned land use represents an adverse impact of Alternative 4 that cannot be mitigated. Avoidance of this impact would require remediation of the ASB as provided under other project alternatives (Alternatives 5, 6, 7 or 8).

## Air and Noise

Alternative 4 involves significant construction activities associated with project dredging and capping. These activities will take place over the course of one or two construction seasons. Potential impacts to area noise and air quality levels will need to be mitigated to avoid environmental impacts. However, mitigation can be accomplished through the use of best practices for project design, permitting, and construction.

Potential mitigation measures for noise impacts include 1) contractual requirements to avoid exceedances of ambient noise level restrictions, 2) contractor use of appropriate equipment including mufflers as required, and 3) use of appropriate work periods if required to comply with noise level restrictions.

Air quality impacts associated with capping activities could be experienced either through emissions from construction equipment, or through dust from temporary stockpiles of capping material prior to placement. These impacts can be mitigated through 1) contractual requirements to avoid impacts to air quality, 2) the use of appropriate equipment meeting applicable air quality control requirements, 3) the use of appropriate construction measures (e.g., wetting or covering of cap material stockpiles to control fugitive dust emissions, or 4) the direct supply of cap material by barges to the capping site. These mitigation measures should be incorporated during project design and permitting.

### Cultural Resources

Alternative 4 does not include dredging at the head of the Whatcom Waterway in the area near former Citizens Dock. This was an area that was identified during previous archaeological assessment activities as potentially containing undisturbed historical or cultural resources. While additional historical and cultural resource review will be performed as part of the Section 106 consultations as part of project permitting, Alternative 4 has a low probability of impacting historical or archaeological resources.

# 4.6 Project Alternative 5

Alternative 5 uses multiple technologies to comply with SMS cleanup levels. Institutional controls, monitored natural recovery, and containment are used in various portions of the site. Removal and upland disposal are used for ASB sludges and impacted sediments from outside of the ASB. The ASB sludges are treated to achieve volume reduction prior to disposal.

## 4.6.1 Cleanup Description

The design concept for Alternative 5 is shown in Figure 4-6. A detailed description of the alternative follows.

### Actions by Site Area

Under Alternative 5 dredging activities within the Whatcom Waterway are targeted on appropriate areas to support a multi-purpose Waterway concept, including a mix of deep-draft navigation, public access, transient moorage, and habitat enhancement uses. Sediments dredged from the Waterway and the sludges removed from the ASB are managed by upland disposal at appropriately-permitted off-site Subtitle D facilities. Specific actions within each site unit are described below:

- **Outer Whatcom Waterway (Unit 1):** Under Alternative 5, the outer portion of the waterway would be dredged to a depth approximately 35 feet below MLLW, as with Alternative 4. The residual sediments in this area would be capped with a thick sediment cap. The cap would provide a sufficient thickness of cap material to allow for future waterway maintenance dredging, and would provide resistance against potential erosion by prop wash. Sediments removed during this dredging would be barged to an offload facility within Port-owned property, and would be transferred to for transportation to an appropriately-permitted offsite disposal facility. The sediments from waterway Units 1A and 1B are managed by PSDDA disposal, as in Alternative 4. Mechanical dredging methods would likely be used in the Outer Whatcom Waterway area.

- **Inner Whatcom Waterway (Units 2 & 3):** The cleanup of the Inner Whatcom Waterway will be performed using the same approach as with Alternative 4. The alternative assumes that the 1960s federal channel will be updated at the head of the waterway to provide for integrated public access, habitat enhancement, and navigation uses. The design concept for Alternative 5 assumes that the majority of the Inner Whatcom Waterway is managed for effective water depths of between 18 feet and 22 feet. This water depth range provides for navigation opportunities consistent with the mixed-use zoning of the waterfront properties. Under Alternative 5, the emergent tideflats at the head of the waterway are preserved, and shallow-water habitat areas along the sides of the waterway are preserved and enhanced. At the same time, the central portion of the waterway is dredged to depths 5 feet below the planned effective water depth. A sediment cap is then applied over any residual sediments, with the cap grading from a minimum thickness of 3 feet, to a maximum thickness of 6 feet in areas near the Log Pond and Bellingham Shipping Terminal. Shoreline slopes would be stabilized using appropriate side-slopes and materials.

- **Log Pond (Unit 4):** The Log Pond area was previously remediated as part of an Interim Action implemented in 2000. Subsequent monitoring has demonstrated the protectiveness of the subaqueous cap, and the effectiveness of habitat enhancement actions completed as part of that project. Actions in this area will be limited to enhancements to the shoreline edges of the cap, to ensure long-term stability of the cap edges. These enhancements are described in Appendix D of the FS Report.

- **Areas Offshore of ASB (Unit 5):** Exceedances of site-specific cleanup goals within Unit 5-B will be remediated using sub-aqueous capping. Appendix C of the FS Report describes the design concept for this area, including methods to maintain cap stability in a manner compatible with anticipated permitting requirements. The remaining areas of Unit 5 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas at this time. Additional evaluations of sediment stability will be conducted as part of engineering design. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels. Additional measures will be taken in this area only if engineering design evaluations indicate that such measures are required.

- **Areas near Bellingham Shipping Terminal (Unit 6):** The area south of the barge docks at the Bellingham Shipping (Units 6-B and 6-C) exceeds SMS cleanup levels. This area will be remediated using a deep-water sub-aqueous cap. Final water depths in this area will be greater than -18 feet MLLW in most areas, consistent with shoreline infrastructure and navigation uses historically conducted there. The cap will be constructed of coarse granular materials and will be designed to resist potential prop-wash erosion effects. The remaining portions of Unit 6 comply with site-specific cleanup goals. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **Starr Rock (Unit 7):** Sediments in the Starr Rock area currently comply with site-specific cleanup levels. No sediment capping or dredging is proposed for these areas. These areas will be monitored to document the continued effectiveness of natural recovery at complying with cleanup levels.

- **ASB (Unit 8):** Under Alternative 5, the ASB sludges would be removed from the waterfront. The design concept is based on a five-step process. First, the water level in the ASB will be lowered and the connection between the ASB and the outfall plugged. Second, the water treatment equipment (aerators, weirs, etc.) will be removed, and the tops of the berms removed. These berm materials consist of clean sand and stone materials used to construct the ASB and can be reused within other portions of the project area. The exterior of the berm will be reduced in elevation to approximately 16 feet above MLLW. The interior of the berm will be removed to elevations approximately 10 feet above

MLLW. Sheet piling will be driven along the berm to prevent migration of impacted water through the berm during dredging. Third, the majority of the ASB sludges will be removed by hydraulic dredging. The hydraulic dredge slurry will be treated in centrifuges or hydrocyclones to separate sludge solids form the entrained waters. Solids separated from the dredge slurry will be shipped by rail for upland disposal. Water from the hydraulic dredging will be returned to the ASB in a closed-loop system, to minimize the overall generation of contaminated waters. The use of hydraulic dredging and maintenance of a water layer overlying the sludges during removal will also minimize odors and potential wildlife exposures during sludge removal. During the fourth step, the impacted waters from the ASB will be pumped out, treated to remove suspended and dissolved contaminants, and will be discharged to the sanitary sewer. If sewer capacity is limited, the treated waters will be managed using a permitted temporary surface water discharge. Finally, the residual solids within the dewatered ASB will be removed by land-based excavation equipment. By conducting this final phase of removal without overlying water, the result will maximize sludge removal and minimize residual contamination. Following cleanout of the sludges, the sheet-piling may be removed from the ASB, the ASB filled to appropriate elevations with surface water, and the berm opened. Some additional impacted sediments will be generated for upland disposal at the time the new access channel to the ASB (Unit 2-B) is created.

## Sediment Disposal

Sediments removed from Waterway under this Alternative will be managed by disposal in appropriately-permitted upland disposal sites. The design concept for Alternative 5 estimates disposal of approximately 76,000 cubic yards of sediments dredged from the Outer and Inner Whatcom Waterway areas and the disposal of approximately 412,000 cubic yards of sludges removed from the ASB. An additional 113,000 cubic yards of sediments dredged from Units 1A and 1B would be managed by beneficial reuse or PSDDA disposal.

The design concept for Alternative 5 assumes that dredged sediments and ASB sludges are shipped by rail to the upland disposal site. Rail shipment is more fuel efficient and provides fewer traffic conflicts than truck transportation. As with Alternative 4, the Alternative 5 design concept and cost estimate assumes the placement of temporary rail improvements at the former GP mill site. Stormwater management and “surge” stockpile areas are included in the project cost assumptions.

### Costs and Schedule

The probable costs of Alternative 5 are approximately $42 million. In order of decreasing cost, this estimate addresses removal and disposal of the ASB sludges, dredging and upland disposal of Whatcom Waterway sediments, capping costs for the Waterway and harbor areas, enhancements to the Log Pond shoreline, and provisions for long-term monitoring. Under Alternative 5, clean sediments and stone from the ASB berms are reused within the project as part of capping, shoreline stabilization, and habitat enhancement actions.

Because of the work within the ASB, the construction activities are more complex than those in alternative 4, resulting in a longer construction period. The construction of alternative 5 will likely require a three-phase construction cycle, taking place over a 3 to 4 year period. The initial ASB preparation and waterway dredging activities will take place during the first construction phase. The second construction phase will involve ASB sludge removal, dewatering and final ASB cleanout. The final construction phase will involve opening of the ASB berm, completion of final dredging and capping activities within the waterway areas. The first and third phases of construction will be restricted to appropriate “fish windows.” The second construction phase will not involve activities in areas connected to surface water, and will not necessarily be subject to “fish window” limitations.

Monitoring of capped and natural recovery areas will occur under Alternative 5. Because natural recovery is only applied in areas that have already achieved compliance with cleanup standards, additional restoration time would not be required.

## 4.6.2 Impacts, Benefits and Mitigation

Alternative 5 provides for substantial net benefits under three of the five environmental categories evaluated in this FSEIS, and mitigation of potential impacts under the other two categories. Table 4-2 summarizes the impacts, benefits, and mitigation associated with Alternative 5.

### Geology, Water and Environmental Health

Alternative 5 provides net beneficial impacts under the environmental category including geology, water, and environmental health. Significant impacts, benefits, and potential mitigation requirements include the following:

- **Beneficial Impact – Sediment Cleanup:** Alternative 5 produces a beneficial impact through remediation and compliance with site cleanup levels consistent with MTCA and SMS requirements. Active cleanup is performed in the ASB Shoulder (Unit 5-B) area, the Barge Dock (Unit 6-B/C), the Inner and Outer Whatcom Waterway areas, and within the ASB. Monitored natural recovery and institutional controls are used to remediate other areas.

- **Mitigated Impact – Construction Water Quality:** Alternative 5 involves extensive construction activities, requiring two in-water construction seasons, and 1-2 additional years for remediation of ASB sludges. To minimize the potential for adverse water quality impacts, these construction activities will need to be mitigated to avoid adverse water quality impacts. Examples of potential mitigation actions include 1) completion of additional water quality review as part of project design and permitting (i.e., Section 401 Water Quality Certification), 2) use of best practices for design, permitting, contracting, and construction of dredging activities to minimize water quality impacts and dredge residuals, and 3) water quality monitoring during construction.

- **Beneficial Impact – Control of Sediment Resuspension:** Alternative 5 conducts active remediation by capping and dredging in the impacted harbor areas and in the Whatcom Waterway channel. These actions reduce the potential for future sediment resuspension in these areas.

- **Beneficial Impact – Channel Updating & Stabilization:** Alternative 5 includes updating of Whatcom Waterway channel dimensions, consistent with plans for a locally-managed multi-purpose channel. Under this alternative, dredging activities within the waterway are graded, to provide deep draft use areas in the Outer Whatcom Waterway, and to address multiple land use priorities for the Inner Whatcom Waterway. Because the infrastructure exists in the Outer Whatcom Waterway to accommodate deep draft uses, no impacts are associated with deep dredging in that location. For the Inner Whatcom Waterway, Alternative 5 avoids the adverse impacts associated with destabilization of the existing shorelines under Alternatives 2 and 3. Rather, Alternative 5 provides for effective water depths of between 18 and 22 feet, consistent with the needs for transient moorage and planned land uses within the Inner Whatcom Waterway area. Additionally, Alternative 5 provides for stabilization of the side-slopes of the Inner Whatcom Waterway without requiring extensive use of hardened shoreline infrastructure. Alternative 5 allows for shorelines to be softened using slope treatments similar to those shown in Figure 3-6, without adversely impacting navigation opportunities. This shoreline stabilization approach provides significant benefits to habitat conditions within the Inner Whatcom Waterway, as described below.

- **Beneficial Impact – Log Pond Shoreline Stabilization:** Limited erosion has been noted in some shoreline edges of the Log Pond cap. Under Alternative 5, these erosional areas would be corrected, resulting in improved long-term performance of the Log Pond cap, and prevention of erosion and/or recontamination.

- **Beneficial Impact – Berm Material Reuse:** Alternative 5 provides for reuse of clean sand and stone materials from the ASB berm. These materials can be used during site cleanup, habitat enhancement, and area redevelopment activities. Material reuse conserves environmental resources, and avoids the need for quarrying of new materials from off-site locations. This provides a net environmental benefit relative to preceding project Alternatives.

## Fish and Wildlife

Alternative 5 produces a substantial net environmental benefit for fish and wildlife. The alternative incorporates habitat enhancements within the Inner Whatcom Waterway, at the shoulder of the ASB and within the ASB interior. Significant impacts, benefits, and potential mitigation requirements relative to fish and wildlife include the following:

- **Beneficial Impacts – Environmental Protection:** Completion of site remediation provides protection of fish and wildlife from the potential effects of contaminated sediments.

- **Mitigated Impact – Construction Disturbances:** Construction activities of Alternative 5 are significant, but are less than under Alternatives 2 and 3. These short-term disturbances will occur in the dredging and cap areas shown in Figure 4-6. The removal of the ASB sludges is conducted prior to opening of the ASB to Bellingham Bay, reducing potential for impacts during this portion of the work. Potential disturbances to fish and wildlife can be mitigated through the use of best practices for project design, permitting, and construction. Examples of best practices include 1) the timing of work activities to avoid migration periods for juvenile salmonids or other sensitive species, 2) the use of construction equipment, dredge methods, cap materials and placement methods that minimize water quality impacts, noise and physical disturbances to aquatic habitats, and 3) completion of additional environmental reviews as part of project design and permitting. These measures are considered likely to mitigate the short-term habitat impacts associated with construction disturbances under Alternative 5.

- **Beneficial Impact – Inner Whatcom Waterway Habitat:** Alternative 5 preserves and enhances existing nearshore aquatic habitats at the head and along the sides of the Inner Whatcom Waterway. This represents a benefit relative to other project alternatives (i.e., Alternatives 2, 3, 7 and 8) that permanently disrupt these emergent habitat areas. The shoreline stabilization and channel patterns provided under Alternative 5 specifically incorporate habitat enhancement in their design. The alternatives provides for large stretches of continuous habitat enhancement along important salmonid migration corridors, and provides habitat connectivity with recent restoration actions completed by the City in the Whatcom Creek Estuary and Maritime Heritage Park (see Figure 1-2). These benefits are achieved under Alternative 5 without adversely impacting shoreline land uses or anticipated navigation opportunities within the Inner Whatcom Waterway. Some conversion of nearshore habitat to deep water habitat is required to develop the marina access channel in Unit 2-B, but this change is offset by net habitat benefits achieved in other portions of the waterway and parts of the site.

- **Mitigated Impacts – Log Pond Shoreline Enhancements:** Construction of Alternative 5 will involve some in-water construction activities within the Log Pond to enhance the stability of area shorelines. These actions will involve a change in substrate conditions in limited areas, with placement of pebbles and beach gravels in some areas, and placement of stone groins for material retention in other areas. The actions are expected to result in minimal changes to the area of intertidal habitat. However, potential adverse impacts associated with substrate changes may require mitigation through habitat gains in other areas under the alternative.

- **Beneficial Impact – Unit 5-B Capping Area:** Alternative 5 achieves development of a new habitat bench within Unit 5B. This habitat benefit is significant. Under Alternative 5, this habitat area is contiguous with habitat enhancement areas in the Inner Whatcom Waterway, and with new habitat areas developed inside the restored ASB.

- **Beneficial Impact – Aquatic Reuse of ASB:** Alternative 5 also provides for sludge cleanout of the ASB, including opening of the remediated facility for future aquatic uses. This results in the development of 4,500 linear feet of new nearshore migration corridors for juvenile salmonids, and restoration of over 28 acres of new open water habitat.

## Land Use, Navigation and Public Shoreline Access

Alternative 5 directly addresses identified land use, navigation and public shoreline access plans for the New Whatcom area. Like Alternative 4, the cleanup approach provides for development of a multi-purpose channel in the Whatcom Waterway. In addition, the alternative provides for aquatic reuse of the ASB for development of an environmentally sustainable marina with integrated public access and habitat enhancements. Alternative 5 provides net beneficial impacts under the categories of land use, navigation, and public shoreline access. A summary of significant impacts, benefits, and mitigation for Alternative 5 is provided below:

- **Beneficial Impacts – Outer Whatcom Waterway Navigation:** Like Alternatives 2, 3, and 4, Alternative 5 supports continued deep draft navigation capabilities in the Outer Whatcom Waterway where the shoreline infrastructure currently supports deep draft navigation uses. This alignment of dredging patterns with land use and navigation needs represents a benefit of Alternative 5.

- **Beneficial Impact – Inner Whatcom Waterway Land Use:** Alternative 5 includes updating of Whatcom Waterway channel dimensions, consistent with plans for a locally-managed multi-purpose channel. Alternative 5 provides for effective water depths of between 18 and 22 feet, consistent with historical authorized depths in the Inner Whatcom Waterway, and consistent with the needs for transient moorage and other uses planned for the Inner Whatcom Waterway area. Additionally, Alternative 5 provides for stabilization of the side-slopes of the Inner Whatcom Waterway without requiring extensive use of hardened shoreline infrastructure. Alternative 5 allows for shorelines to be softened using slope treatments similar to those shown in Figure 3-6, without adversely impacting navigation opportunities. Infrastructure costs are reduced while simultaneously maximizing land use flexibility and improving both habitat conditions and navigation opportunities. Effective water depths within the Inner Whatcom Waterway will be between 18 and 22 feet under this Alternative. Deeper draft vessels can be accommodated in the Outer Whatcom Waterway near the Bellingham Shipping Terminal. The navigation uses for the Inner Whatcom Waterway would accommodate transitional uses by tug boats and barges. Compatible navigation uses consistent with the long-term redevelopment of the waterfront include access by recreational vessels, whale watching boats, intermediate-draft institutional vessels (i.e., research boats), sailing ships (i.e., most "Tall Ships Festival" vessels) and most passenger-only ferries. Alternative 5 stabilizes Inner Whatcom Waterway shoreline without triggering requirements for substantial new shoreline infrastructure. This substantially reduces the cost, land use and habitat impacts associated with preceding Alternatives 2 and 3.

- **Beneficial Impact – Consistency with Planned ASB Reuse:** The ASB has been identified in previous land use studies as the preferred location for development of a future environmentally sustainable marina. Alternative 5 removes contaminated sludges from the ASB and reconnects the remediated ASB to surface waters of Bellingham Bay using an access channel constructed in Unit 2-B. This cleanup approach allows for aquatic reuse of the ASB as part of waterfront revitalization efforts, consistent with waterfront design concepts shown in Figure 3-7 and Appendix E.

### Air and Noise

Alternative 5 involves significant construction activities associated with project dredging and capping activities. These activities will take place over the course of three to four construction seasons. Potential impacts to area noise and air quality levels will need to be mitigated to avoid environmental impacts. However, mitigation can be accomplished through the use of best practices for project design, permitting, and construction.

Potential mitigation measures for noise impacts include 1) contractual requirements to avoid exceedances of ambient noise level restrictions, 2) contractor use of appropriate equipment including mufflers as required, and 3) use of appropriate work periods if required to comply with noise level restrictions.

Air quality impacts associated with capping activities could be experienced either through emissions from construction equipment, or through dust from temporary stockpiles of capping material prior to placement. These impacts can be mitigated through 1) contractual requirements to avoid impacts to air quality, 2) the use of appropriate equipment meeting applicable air quality control requirements, 3) the use of appropriate construction measures (e.g., wetting or covering of cap material stockpiles to control fugitive dust emissions, or 4) the direct supply of cap material by barges to the capping site. These mitigation measures should be incorporated during project design and permitting.

### Cultural Resources

Alternative 5 does not include dredging at the head of the Whatcom Waterway in the area near former Citizens Dock. This was an area that was identified during previous archaeological assessment activities as potentially containing undisturbed historical or cultural resources. While additional historical and cultural resource review will be performed as part of the Section 106 consultations as part of project permitting, Alternative 5 has a low probability of impacting historical or archaeological resources.

## 4.7 Project Alternative 6

Cleanup Alternative 6 is in most respects the same as Alternative 5. The difference between the alternatives is that under Alternative 6 additional dredging is conducted adjacent to the Bellingham Shipping Terminal. Other features of the Alternative, including the cleanout of the ASB and the remedial approach to the Inner Whatcom Waterway and Harbor areas, are the same as in Alternative 5.

### 4.7.1 Cleanup Description

The design concept for Alternative 6 is shown in Figure 4-7. A detailed description of the Alternative follows:

#### Actions by Site Area

Because many aspects of this alternative are the same as with Alternative 5, the alternative description below focuses only on areas of difference between the two cleanup alternatives. Both conduct remediation of the ASB using removal, treatment, and upland disposal technologies. They both remediate the Inner Whatcom Waterway with dredging and capping, consistent with the vision of a locally-managed multi-purpose channel. Remediation activities outside of the waterway are also similar, including development of a cap and habitat bench along the ASB shoulder (Unit 5-B) and capping in the barge dock area (Unit 6B and 6C). The principal difference between the two alternatives is the extent of dredging near the Bellingham Shipping Terminal (Unit 1-C).

Under Alternative 5, the extent of dredging provides for maintenance of the 30-ft federal channel in the Outer Whatcom Waterway. This requires dredging to depths of at least 35 feet below MLLW. Residual sediments are capped with a thick layer of sediment. In contrast, Alternative 6 conducts sediment removal in the Unit 1-C area to the extent technically practicable. Under this alternative, the depth of dredge cuts would be increased, in most areas extending dredging to the interface with clean native sediments. The depth of dredging under Alternative 6 would range from 35 feet to 41 feet below MLLW in Unit 1-C. The dredging would need to address geotechnical and structural integrity limitations associated with existing piers and structures in the terminal area. However, it is expected that most portions of Unit 1C could be remediated, without requiring subsequent application of a thick cap.

#### Sediment Disposal

As with Alternative 5, all impacted sediments dredged from the Waterway and all of the sludges removed from the ASB would be managed by upland disposal at appropriately permitted facilities. Alternative 6 does not involve the creation of new disposal sites within Bellingham Bay.

The design concept for Alternative 6 estimates disposal of approximately 118,000 cubic yards of sediments dredged from the Outer and Inner Whatcom Waterway areas and the disposal of approximately 412,000 cubic yards of sludges removed from the ASB. An additional 113,000 cubic yards of sediments dredged from Units 1A and 1B would be managed by beneficial reuse or PSDDA disposal.

Transportation of sediments for upland disposal would be conducted by rail to minimize fuel use and avoid potential traffic impacts. The design concept and cost estimate assumes the placement of supplemental temporary rail improvements at the former GP mill site. Stormwater management and "surge" stockpile areas are included in the project cost assumptions.

### Costs and Schedule

The probable costs of Alternative 6 are approximately $44 million. The costs of in order of decreasing cost, this estimate addresses removal and disposal of the ASB sludges, dredging and upland disposal of Whatcom Waterway sediments, capping costs for the portions of the Waterway and harbor areas, enhancements to the Log Pond shoreline, and provisions for long-term monitoring. Under Alternative 6, clean sediments and stone from the ASB berms are reused within the project as part of capping, shoreline stabilization and habitat enhancement actions.

The schedule and phasing of construction activities under Alternative 6 are similar to those under Alternative 5. The work will likely require a three-phase construction cycle, taking place over a 3 to 4 year period. The initial ASB preparation and waterway dredging activities will take place during the first construction phase. The second construction phase will involve ASB sludge removal, dewatering and final cleanout. The final construction phase will involve opening of the ASB berm, completion of final dredging and capping activities within the waterway areas. The first and third phases of construction will be restricted to appropriate "fish windows." The second construction phase will not involve activities in areas connected to surface water, and will not necessarily be subject to "fish window" limitations.

Monitoring of capped and natural recovery areas will occur under Alternative 6. Because natural recovery is only applied in areas that have already achieved compliance with cleanup standards, additional restoration time would not be required.

## 4.7.2 Impacts, Benefits and Mitigation

Table 4-2 summarizes the impacts, benefits, and mitigation associated with Alternative 6. The Alternative and its environmental impacts/benefits are very similar to Alternative 5.

### Geology, Water and Environmental Health

As with Alternative 5, Alternative 6 provides a significant net environmental benefit under the category including geology, water, and environmental health. Significant impacts, benefits, and potential mitigation requirements include the following:

- **Beneficial Impact – Sediment Cleanup:** Alternative 6 produces a beneficial impact through remediation and compliance with site cleanup levels consistent with MTCA and SMS requirements. Active cleanup is performed in the ASB Shoulder (Unit 5-B) area, the Barge Dock (Unit 6-B/C), the Inner and Outer Whatcom

Waterway areas, and within the ASB. Monitored natural recovery and institutional controls are used to remediate other areas.

- **Mitigated Impact – Construction Water Quality:** Alternative 6 involves extensive construction activities, requiring two in-water construction seasons, and 1-2 additional years for remediation of ASB sludges. To minimize the potential for adverse water quality impacts, these construction activities will need to be mitigated to avoid adverse water quality impacts. Examples of potential mitigation actions include 1) completion of additional water quality review as part of project design and permitting (i.e., Section 401 Water Quality Certification), 2) use of best practices for design, permitting, contracting, and construction of dredging activities to minimize water quality impacts and dredge residuals, and 3) water quality monitoring during construction.

- **Beneficial Impact – Control of Sediment Resuspension:** Alternative 6 conducts active remediation by capping and dredging in the impacted harbor areas and in the Whatcom Waterway channel. These actions reduce the potential for future sediment resuspension in these areas.

- **Beneficial Impact – Channel Updating & Stabilization:** Alternative 6 includes updating of Whatcom Waterway channel dimensions, consistent with plans for a locally-managed multi-purpose channel. Under this alternative, dredging activities within the waterway are graded, to provide deep draft use areas in the Outer Waterway, and to address multiple land use priorities for the Inner Whatcom Waterway. Because the infrastructure exists in the Outer Whatcom Waterway to accommodate deep draft uses, no impacts are associated with deep dredging in that location. For the Inner Whatcom Waterway, Alternative 6 avoids the adverse impacts associated with destabilization of the existing shorelines under Alternatives 2 and 3. Rather, Alternative 6 provides for effective water depths of between 18 and 22 feet, consistent with the needs for transient moorage and other uses planned for the Inner Whatcom Waterway area. Additionally, Alternative 6 provides for stabilization of the side-slopes of the Inner Whatcom Waterway without requiring extensive use of hardened shoreline infrastructure. Alternative 6 allows for shorelines to be softened using slope treatments similar to those shown in Figure 3-6, without adversely impacting navigation opportunities. This shoreline stabilization approach provides significant benefits to habitat conditions within the Inner Whatcom Waterway, as described below.

- **Beneficial Impact – Log Pond Shoreline Stabilization:** Limited erosion has been noted in some shoreline edges of the Log Pond cap. Under Alternative 6, these erosional areas would be corrected, resulting in improved long-term performance of the Log Pond cap, and prevention of erosion and/or recontamination.

- **Beneficial Impact – ASB Sludge Remediation:** Alternative 6 conducts active remediation of the ASB using dredging, dewatering treatment and upland disposal.
- **Beneficial Impact – Berm Material Reuse:** Alternative 6 provides for reuse of clean sand and stone materials from the ASB berm. These materials can be used during site cleanup, habitat enhancement, and area redevelopment activities. Material reuse conserves environmental resources, and avoids the need for quarrying of new materials from off-site locations. This provides a net environmental benefit relative to other project Alternatives.

## Fish and Wildlife

As with Alternative 5, Alternative 6 provides for substantial net beneficial impacts benefit for fish and wildlife. The alternative incorporates significant habitat enhancements within the Inner Whatcom Waterway, at the shoulder of the ASB and within the ASB interior. There are no significant differences between Alternatives 5 and 6 with respect to fish and wildlife.

## Land Use, Navigation and Public Shoreline Access

Like Alternative 5, Alternative 6 directly addresses identified land use, navigation, and public shoreline access priorities for the New Whatcom area. The cleanup approach provides for development of a multi-purpose channel in the Whatcom Waterway. In addition, the alternative provides for aquatic reuse of the ASB for development of an environmentally sustainable marina with integrated public access and habitat enhancements. Alternative 6 provides a net benefit under the categories of land use, navigation, and public shoreline access.

The main difference between Alternatives 5 and 6 is the completion of additional dredging in the Outer Whatcom Waterway near the Bellingham Shipping Terminal. This expanded dredging may permit future deepening of the Outer Whatcom Waterway should a need for additional depth be identified. This represents a beneficial land use impact in that it provides additional long-term navigation and land use flexibility beyond that provided in Alternative 5. However, at this time there are no identified needs for that additional depth.

Other land use, navigation and public shoreline access benefits of Alternative 6 are the same as with Alternative 5. These benefits are summarized in Table 4-2.

### Air and Noise

Air and noise impacts of Alternative 6 are similar to those of Alternative 5. As with Alternative 5, these impacts are associated with significant construction activities associated with project dredging and capping activities. These activities will take place over the course of three to four construction seasons. Potential impacts to area noise and air quality levels will need to be mitigated to avoid environmental impacts. However, mitigation can be accomplished through the use of best practices for project design, permitting and construction.

Potential mitigation measures for noise impacts include 1) contractual requirements to avoid exceedances of ambient noise level restrictions, 2) contractor use of appropriate equipment including mufflers as required, and 3) use of appropriate work periods if required to comply with noise level restrictions.

Air quality impacts associated with capping activities could be experienced either through emissions from construction equipment, or through dust from temporary stockpiles of capping material prior to placement. These impacts can be mitigated through 1) contractual requirements to avoid impacts to air quality, 2) the use of appropriate equipment meeting applicable air quality control requirements, 3) the use of appropriate construction measures (e.g., wetting or covering of cap material stockpiles to control fugitive dust emissions, or 4) the direct supply of cap material by barges to the capping site. These mitigation measures should be incorporated during project design and permitting.

### Cultural Resources

Alternative 6 does not include dredging at the head of the Whatcom Waterway in the area near former Citizens Dock. This was an area that was identified during previous archaeological assessment activities as potentially containing undisturbed historical or cultural resources. While additional historical and cultural resource review will be performed as part of the Section 106 consultations as part of project permitting, Alternative 6 has a low probability of impacting historical or archaeological resources.

## 4.8 Project Alternative 7

Alternative 7 uses the same technologies as Alternatives 5 and 6 to comply with SMS cleanup levels. These include institutional controls, monitored natural recovery, containment, removal and disposal, treatment, and reuse and recycling. The elements of Alternative 7 and the differences between it and alternatives 5 and 6 are described below by site Unit.

## 4.8.1 Cleanup Description

The design concept for Alternative 7 is shown in Figure 4-8. A detailed description of the alternative follows.

### Actions by Site Area

Like Alternative 5 and 6, Alternative 7 uses a mix of technologies to accomplish the remediation of the Whatcom Waterway site. The ASB is remediated using removal, treatment, and upland disposal technologies, consistent with alternatives 5 and 6. The Outer Whatcom Waterway areas are similarly remediated by dredging and upland disposal, as in Alternative 6. Unlike the preceding Alternatives, Alternative 7 removes sediment from the Inner Whatcom Waterway consistent with the dimensions of the 1960's industrial channel.

Under Alternative 7 dredging is conducted consistent with the dredge prisms used in Alternative 2 and Alternative 3. Impacted sediments that are more than 5 feet below the 1960s channel project depth are capped in place, using a thick sediment cap. Capping may also be used in nearshore berth areas where full sediment removal is technically impracticable, or where the shoreline infrastructure does not allow sediments to be removed without compromising side-slope stability or the integrity of existing structures.

Other aspects of Alternative 7 remain the same as in alternative 6. These include the capping of the ASB shoulder and barge dock areas, the enhancements to the Log Pond shoreline, and the use of monitored natural recovery for other bottom areas that currently comply with site cleanup levels.

### Sediment Disposal

Sediments removed from the Waterway under Alternative 7 will be managed by disposal in appropriately-permitted upland disposal sites. The design concept for Alternative 7 estimates disposal of approximately 479,000 cubic yards of sediments dredged from the Outer and Inner Whatcom Waterway areas and the disposal of approximately 412,000 cubic yards of sludges removed from the ASB. This represents an increase of 113,000 cubic yards of sediment disposal over that provided in Alternative 6.

As with Alternative 6, the design concept for Alternative 7 assumes that dredged sediments and ASB sludges are shipped by rail to the upland disposal site. Rail shipment is more fuel efficient and provides fewer traffic conflicts than truck transportation.

### Costs & Schedule

The probable costs of Alternative 7 are $74 million. The costs of in order of decreasing cost, this estimate addresses dredging and upland disposal of the 1960s federal channel sediments, removal and disposal of the ASB sludges, capping costs for the portions of the Waterway and harbor areas, enhancements to the Log Pond shoreline, and provisions for long-term monitoring.

Like Alternatives 2 and 3, implementation of Alternative 7 must be integrated with shoreline infrastructure upgrades along the Inner Whatcom Waterway shoreline. This will increase the time required for project design and permitting relative to Alternative 6. The additional dredging involved in Alternative 7 also increases the duration and complexity of project construction activities. Alternative 7 is likely to require an additional year of construction over that required in Alternative 6.

Monitoring of capped and natural recovery areas will occur under Alternative 7. Because natural recovery is only applied in areas that have already achieved compliance with cleanup standards, additional restoration time would not be required for natural recovery to occur.

### 4.8.2 Impacts, Benefits and Mitigation

Table 4-2 summarizes the environmental impacts, benefits, and mitigation associated with Alternative 7.

#### Geology, Water and Environmental Health

Alternative 7 produces net adverse impacts under the category including geology, water, and environmental health. Significant impacts, benefits, and potential mitigation requirements include the following:

- **Beneficial Impact – Sediment Cleanup:** Alternative 7 produces a beneficial impact through remediation and compliance with site cleanup levels consistent with MTCA and SMS requirements. Active cleanup is performed in the ASB Shoulder (Unit 5-B) area, the Barge Dock (Unit 6-B/C), the Inner and Outer Whatcom Waterway areas, and within the ASB. Monitored natural recovery and institutional controls are used to remediate other areas.

- **Mitigated Impacts – Construction Water Quality:** Alternative 7 involves extensive in-water construction activities associated with dredging and capping. The project will also trigger the need for additional shoreline infrastructure improvements in the Inner Whatcom Waterway. The project likely will likely require 4 in-water construction seasons to complete, plus additional time to remediate the ASB and upgrade shoreline infrastructure. These construction activities will need to be mitigated to avoid adverse water quality impacts. Examples of potential mitigation actions include 1) completion of additional water quality review as part of project design and permitting (i.e., Section 401 Water Quality Certification), 2) use of best practices for design, permitting, contracting and construction of dredging activities to minimize water quality impacts and dredge residuals, 3) water quality monitoring during construction, and 4) coordination of cleanup and shoreline infrastructure projects to minimize water quality disturbances.

- **Beneficial Impact – Control of Sediment Resuspension:** Alternative 7 conducts active remediation by capping in Site Units 5-B, 6-B/C and dredging and capping in the Whatcom Waterway channel. These actions reduce the potential for future resuspension of contaminated sediments in navigation areas.

- **Adverse Impact – Shoreline Destabilization:** Alternative 7 includes deep dredging in the Inner Whatcom Waterway in order to comply with the dimensions of the 1960s industrial channel. This deep dredging will tend to further destabilize existing shorelines in this area. To avoid shoreline stability failures, the shoreline will need to be stabilized with new infrastructure compatible with the deep dredging patterns. To sustain use of the deep navigation depths, mitigation will be required, including the construction of hardened shoreline treatments including bulkheads and over-water wharves will be required. The potential costs to construct this type of shoreline infrastructure have been estimated at $20 to $40 million for the Inner Whatcom Waterway. These costs are not included in the remediation cost estimates of Alternative 7. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. These costs are not included in the remediation cost estimates of Alternative 7.

- **Beneficial Impact – Log Pond Shoreline Stabilization:** Limited erosion has been noted in some shoreline edges of the Log Pond cap. Under Alternative 7, these erosional areas would be corrected, resulting in improved long-term performance of the Log Pond cap, and prevention of erosion and/or recontamination.

- **Beneficial Impact – Berm Material Reuse:** Alternative 7 provides for reuse of clean sand and stone materials from the ASB berm. These materials can be used during site cleanup, habitat enhancement, and area redevelopment activities. Material reuse conserves environmental resources, and avoids the need for quarrying of new materials from off-site locations. This provides a net environmental benefit relative to project Alternative 1-4 and the No Action Alternative.

## Fish and Wildlife

Alternative 7 includes a mix of benefits and impacts to fish and wildlife. Benefits are achieved through restoration of aquatic uses in the ASB, and development of a habitat bench offshore of the ASB. Impacts are incurred in the Inner Whatcom Waterway associated with the destruction of emergent nearshore habitat and the requirements for hardened shoreline infrastructure to stabilize Inner Whatcom Waterway shorelines. Habitat improvements may be sufficient to mitigate for project impacts, though additional review would need to be conducted during remedial design and permitting. Significant impacts, benefits, and potential mitigation requirements associated with Alternative 7 include the following:

- **Beneficial Impacts – Environmental Protection:** Completion of site remediation provides protection of fish and wildlife from the potential effects of contaminated sediments.

- **Mitigated Impact – Construction Disturbances:** Construction of Alternative 7 includes significant construction-related habitat disturbances. These disturbances will occur in several areas, over four construction seasons. Potential disturbances to fish and wildlife must be mitigated in these areas through the use of best practices for project design, permitting and construction. Examples of best practices include 1) the timing of work activities to avoid migration periods for juvenile salmonids or other sensitive species, 2) the use of construction equipment, dredge methods, cap materials and placement methods that minimize water quality impacts, noise and physical disturbances to aquatic habitats, and 3) completion of additional environmental reviews as part of project design and permitting. These measures are considered likely to mitigate the short-term habitat impacts associated with construction disturbances under Alternative 7.

- **Mitigated Impact – Inner Whatcom Waterway Habitat:** Through its aggressive dredging of the 1960s industrial channel, Alternative 7 triggers the permanent destruction of emergent shallow-water habitats at the head and along the sides of the Inner Whatcom Waterway. These impacts are integral to the alternative and cannot be mitigated except by creation of new replacement habitat in alternative site areas. Impact avoidance would require the use of alternative channel dimensions (as in Alternative 4, 5 and 6). In addition to the direct impacts associated with the deep dredging, additional habitat impacts will be incurred during the construction of hardened shoreline infrastructure as necessary to stabilize shorelines and support the use and maintenance of the deep draft waterway uses in the Inner Whatcom Waterway under Alternative 7. However, because Alternative 7 includes significant development of new nearshore habitat, it appears that the impacts to habitat in the Inner Whatcom Waterway are mitigated within the Alternative. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. This approach would mitigate the habitat losses associated with deep dredging in the Inner Waterway. These mitigation costs are not included in the remediation cost estimates of Alternative 7 and likely exceed mitigation measures that would reasonably be required under this Alternative.

- **Mitigated Impacts – Log Pond Shoreline Enhancements:** Construction of Alternative 7 will involve some in-water construction activities within the Log Pond to enhance the stability of area shorelines. These actions will involve a change in substrate conditions in limited areas, with placement of pebbles and beach gravels in some areas, and placement of stone groins for material retention in other areas. The actions are expected to result in minimal changes to the area of intertidal habitat. However, potential adverse impacts associated with substrate changes may require mitigation through habitat gains in other areas under the alternative.

- **Beneficial Impact – Development of New Habitat:** Alternative 7 includes development of new premium nearshore habitat in the location of the habitat bench within Unit 5B, as in preceding alternatives 1 through 6.

- **Mitigated Impact – Alternative ASB Access Channel:** Under Alternative 7, the alignment of the marina and the placement of the marina access channel may require modification to avoid conflicts with navigation traffic associated with the industrial channel. The alternative alignment will require a greater disruption to existing shallow-water areas offshore of the ASB, and will reduce the area available for habitat bench development. However, it is likely that Alternative 7 maintains sufficient habitat enhancement to mitigate for the effects of this change.

- **Beneficial Impact – ASB Habitat Gains:** Like Alternatives 5 and 6, Alternative 7 provides for sludge cleanout of the ASB, including opening of the remediated facility for future aquatic uses. This enables development of nearly 4,500 linear feet of new nearshore migration corridors for juvenile salmonids, and development of over 28 acres of new open water habitat.

## Land Use, Navigation and Public Shoreline Access

For the ASB and Outer Whatcom Waterway, the land use benefits and impacts of Alternative 7 are identical to those of Alternatives 5 and 6. The principal difference for Alternative 7 is the reintroduction of a conflict (as in Alternatives 2 and 3) between the cleanup alternative and planned land uses within the Inner Whatcom Waterway. This conflict results in net adverse impacts for land use, navigation, and public access.

As with Alternatives 2 and 3, Alternative 7 conducts dredging of the Inner Whatcom Waterway based on the 1960s industrial channel dimensions. That channel was established for an industrial land use pattern that is inconsistent with current zoning and redevelopment planning. Further, the infrastructure required to fully implement the 1960s federal channel was never fully developed, resulting in shorelines in most of the Inner Whatcom Waterway area that are incapable of achieving an effective water depth consistent with the 1960s channel dimensions without additional stabilization. These shorelines were constructed earlier based on the historical 18-foot waterway depth that existed prior to the 1960s.

As with Alternatives 2 and 3, the Implementation of Alternative 7 poses a significant source of conflict with current planned land use through inconsistency of dredging patterns with planned land uses and navigation requirements, and through requirements for new hardened shoreline infrastructure to stabilize project area shorelines. As with Alternatives 2 and 3, if future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. This approach would mitigate the land use conflicts associated with Alternative 7. These mitigation costs are not included in the remediation cost estimates of Alternative 7.

## Air and Noise

Alternative 7 increases the quantity of construction activities associated with project dredging and capping. Additional impacts will be associated with the construction of new shoreline infrastructure required in the Inner Whatcom Waterway. Potential impacts to area noise and air quality levels will need to be mitigated to avoid environmental impacts. However, mitigation can be accomplished through the use of best practices for project design, permitting and construction.

Potential mitigation measures for noise impacts include 1) contractual requirements to avoid exceedances of ambient noise level restrictions, 2) contractor use of appropriate equipment including mufflers as required, and 3) use of appropriate work periods if required to comply with noise level restrictions.

Air quality impacts associated with capping activities could be experienced either through emissions from construction equipment, or through dust from temporary stockpiles of capping material prior to placement. These impacts can be mitigated through 1) contractual requirements to avoid impacts to air quality, 2) the use of appropriate equipment meeting applicable air quality control requirements, 3) the use of appropriate construction measures (e.g., wetting or covering of cap material stockpiles to control fugitive dust emissions, or 4) the direct supply of cap material by barges to the capping site. These mitigation measures should be incorporated during project design and permitting.

### Cultural Resources

Alternative 7 involves extensive dredging activities, including dredging at the head of the Whatcom Waterway in the area near Citizens Dock. This was an area that was identified during previous archaeological assessment activities as potentially containing undisturbed historical or cultural resources. Potential measures to mitigate impacts to these resources would need to be developed during project design and permitting. This would likely be performed as part of the Section 106 consultations as part of Army Corps of Engineers permitting. This consultation would also cover other site areas, though the potential for presence of undisturbed cultural or historical resource in these other areas is much lower.

# 4.9 Project Alternative 8

Alternative 8 is the last of the alternatives evaluated in the Feasibility Study. The Alternative uses the same range of technologies evaluated for Alternatives 5, 6 and 7 to comply with SMS cleanup levels. However, the extent of dredging and upland disposal is expanded under Alternative 8 relative to the preceding alternatives.

## 4.9.1 Cleanup Description

The design concept for Alternative 8 is shown in Figure 4-9. A detailed description of the alternative follows.

### Actions by Site Area

Alternative 8 manages most site cleanup areas through sediment removal and upland disposal. Like preceding alternatives, Alternative 8 conducts removal and upland disposal for the sludges within the ASB and for sediments within the Waterway navigation areas. However, Alternative 8 also removes sediments in outlying portions of the site, including areas addressed by capping and monitored natural recovery under other alternatives.

- **Outer Whatcom Waterway (Unit 1):** Dredging of the Outer Whatcom Waterway is conducted the same as for Alternatives 6 and 7. Dredging is conducted to native bottom sediments except where this is not technically feasible. Sediments are managed by upland disposal, except for those sediments of Unit 1A and 1B that may be suitable for beneficial reuse or PSDDA disposal.

- **Inner Whatcom Waterway (Units 2 & 3):** Like Alternatives 2, 3 and 7, this alternative conducts dredging within the Inner Whatcom

Waterway as necessary to provide for future use and maintenance of the federal navigation channel to the head of the waterway. The 1960s federal channel boundaries specify a water depth of 30 feet below MLLW from the BST area to Maple Street. A depth of 18 feet is specified from Maple Street to the head of the waterway. In the deeper portion of the waterway, the dredging cut would be established at depths at least 35 feet below MLLW. This would remove sediments where technically feasible, and would provide sufficient over-depth to allow residual sediments to be capped without impeding future maintenance of the federal channel. The design concept assumes a cap thickness of 3 feet over dredged areas with residual subsurface sediment impacts. Due to historical encroachment of the shoreline on the federal channel boundaries, many of the Inner Whatcom Waterway shoreline areas have fill and bulkheads up to or near to the pierhead line. Most of these bulkheads would require replacement and/or substantial upgrades in order to maintain shoreline stability in these areas during and after dredging. Docks may also have to be upgraded or replaced as described in Alternatives 2, 3 and 7 in order to accommodate channel dredging and future use. Containment by capping with appropriate institutional controls will be required for areas where removal is not technically feasible.

- **Log Pond (Unit 4):** The Log Pond area was previously remediated as part of an Interim Action implemented in 2000. Subsequent monitoring has demonstrated the protectiveness of the subaqueous cap, and the effectiveness of habitat enhancement actions completed as part of that project. Actions in this area will be limited to enhancements to the shoreline edges of the cap, to ensure long-term stability of the cap edges. These enhancements are described in Appendix D of the FS report.

- **Harbor Areas (Units 5, 6 & 7):** Under Alternative 8 dredging with upland disposal will be implemented in Unit 5 (ASB shoulder area), Unit 6 (Barge Dock areas) and Unit 7 (Starr Rock area). Sediments that currently exceed cleanup standards, as well as those that currently comply with cleanup standards would be removed. As with portions of the Inner Whatcom Waterway, some residual sediments would remain in areas where removal was not technically feasible. Some institutional controls, monitoring and/or containment would likely be required in portions of Units 5, 6 and 7.

- **ASB (Unit 8):** As with Alternatives 5, 6 and 7, the ASB sludges are removed, treated to reduce volume and are disposed at a permitted upland disposal facility. Removal methods are the same as in Alternatives 5, 6 and 7.

### Sediment Disposal

Sediments removed from Waterway under Alternative 8 will be managed by disposal in appropriately-permitted upland disposal sites. The design concept for Alternative 8 estimates disposal of approximately 1.26 million cubic yards of dredged sediments and the disposal of approximately 412,000 cubic yards of sludges removed from the ASB. This is a dramatic increase in the disposal volumes over the preceding alternatives.

### Costs & Schedule

The probable costs of Alternative 8 are approximately $146 million. This cost is nearly double that of Alternative 7, and is over three times higher than the cost of Alternatives 5 and 6.

The implementation of Alternative 8 will require extensive design and permitting prior to initiation of construction. In areas of the Inner Whatcom Waterway, project planning must be coordinated with future shoreline infrastructure improvements. A design and permitting period of 3 to 6 years is estimated.

The additional dredging involved in Alternative 8 will result in a substantial increase to the duration of project construction. All of the additional dredging will involve work in restricted "fish windows." The project is expected to require between 5 and 7 construction seasons, with in-water work activities during each of those seasons. Including project design and permitting, the restoration time for Alternative 8 is estimated at 8 to 13 years.

Monitoring will likely be required in some areas where removal of sediments is not technically feasible and the application of capping and/or natural recovery is required. As with preceding alternatives, capping is assumed for these areas, resulting in no additional restoration time to achieve compliance with cleanup levels in these areas..

## 4.9.2 Impacts, Benefits and Mitigation

Table 4-2 summarizes the environmental impacts, benefits, and mitigation associated with Alternative 8.

### Geology, Water and Environmental Health

Alternative 8 produces net adverse impacts under the environmental category including geology, water, and environmental health, but these are partially mitigated. Significant impacts, benefits, and potential mitigation requirements include the following:

- **Beneficial Impact – Sediment Cleanup:** Alternative 8 produces a beneficial impact through remediation and compliance with site cleanup levels consistent with MTCA and SMS requirements. Active cleanup is performed in all of the site areas, including dredging and capping. Monitored natural recovery and institutional controls are used in a very limited manner under this Alternative.

- **Mitigated Impacts – Construction Water Quality:** Alternative 8 involves the most in-water construction activities of all of the project alternatives. The project will require extensive dredging within Bellingham Bay to occur over at least five and as many as seven construction seasons. As with Alternatives 2, 3 and 7, Alternative 8 will also trigger the need for additional shoreline infrastructure improvements in the Inner Whatcom Waterway. These construction activities will need to be mitigated to minimize adverse water quality impacts. Examples of potential mitigation actions include 1) completion of additional water quality review as part of project design and permitting (i.e., Section 401 Water Quality Certification), 2) use of best practices for design, permitting, contracting and construction of dredging activities to minimize water quality impacts and dredge residuals, 3) water quality monitoring during construction, and 4) coordination of cleanup and shoreline infrastructure projects to minimize water quality disturbances.

- **Beneficial Impacts – Controlling Sediment Resuspension:** Alternative 8 conducts active remediation by capping in the impacted harbor areas and in the Whatcom Waterway channel. These actions reduce the potential for future sediment resuspension.

- **Adverse Impact – Shoreline Destabilization:** Alternative 8 includes deep dredging in the Inner Whatcom Waterway in order to comply with the dimensions of the 1960s industrial channel. This deep dredging will tend to further destabilize existing shorelines in this area. To avoid shoreline stability failures, the shoreline will need to be stabilized with new infrastructure compatible with the deep dredging patterns. Mitigation will be required, including the construction of hardened shoreline treatments including bulkheads and over-water wharves. The potential costs to construct this type of shoreline infrastructure have been estimated at $20 to $40 million for the Inner Whatcom Waterway. These costs are not included in the remediation cost estimates of Alternative 8. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. These costs are not included in the remediation cost estimates of Alternative 8.

- **Beneficial Impact – Log Pond Shoreline Stabilization:** Limited erosion has been noted in some shoreline edges of the Log Pond cap. Under Alternative 8, these erosional areas would be corrected, resulting in improved long-term performance of the Log Pond cap, and prevention of erosion and/or recontamination.

- **Beneficial Impact – Berm Material Reuse:** Alternative 8 provides for reuse of clean sand and stone materials from the ASB berm. These materials can be used during site cleanup, habitat enhancement, and area redevelopment activities. Material reuse conserves environmental resources, and avoids the need for quarrying of new materials from off-site locations. This provides a net environmental benefit relative to project Alternative 1-4 and the No Action Alternative.

## Fish and Wildlife

Alternative 8 includes net adverse impacts to fish and wildlife. Benefits are achieved through restoration of aquatic uses in the ASB, but these benefits are offset by short-term disturbances during project construction, the permanent destruction of emergent nearshore habitat in the Inner Whatcom Waterway and ASB shoulder areas, and the requirements for hardened shoreline infrastructure in the Inner Whatcom Waterway. Significant impacts, benefits, and potential mitigation requirements associated with Alternative 8 include the following:

- **Beneficial Impacts – Environmental Protection:** Completion of site remediation provides protection of fish and wildlife from the potential effects of contaminated sediments.

- **Mitigated Impact – Construction Disturbances:** Construction of Alternative 8 includes significant construction-related habitat disturbances. The cleanup-related disturbances will occur in several areas, requiring between five and seven construction seasons. Additional disturbances will result from shoreline infrastructure improvements required under this Alternative. Potential disturbances to fish and wildlife must be mitigated in these areas through the use of best practices for project design, permitting, and construction. Examples of best practices include 1) the timing of work activities to avoid migration periods for juvenile salmonids or other sensitive species, 2) the use of construction equipment, dredge methods, cap materials and placement methods that minimize water quality impacts, noise and physical disturbances to aquatic habitats, and 3) completion of additional environmental reviews as part of project design and permitting.

- **Adverse Impact – Inner Whatcom Waterway Habitat:** Through its aggressive dredging of the 1960s federal channel, Alternative 8 triggers the permanent destruction of emergent shallow-water habitats at the head and along the sides of the Inner Whatcom Waterway. These impacts are integral to the alternative and cannot be mitigated except by creation of new replacement habitat in alternative site areas. Impact avoidance would require the use of alternative channel dimensions (as in Alternative 4, 5 and 6). In addition to the direct impacts associated with the deep dredging, additional habitat impacts will be incurred during the construction of hardened shoreline infrastructure as necessary to support the use and maintenance of the deep draft waterway uses in the Inner Whatcom Waterway under Alternative 8. Alternative 8 includes less habitat development than the preceding alternatives, meaning that habitat losses in the Inner Whatcom Waterway may not be sufficiently mitigated within the Alternative. Additional habitat mitigation measures are likely to be required to offset habitat impacts. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. This approach would mitigate the habitat losses associated with deep dredging in the Inner Waterway. These mitigation costs are not included in the remediation cost estimates of Alternative 8.

- **Mitigated Impacts – Log Pond Shoreline Enhancements:** Construction of Alternative 8 will involve some in-water construction activities within the Log Pond to enhance the stability of area shorelines. These actions will involve a change in substrate conditions in limited areas, with placement of pebbles and beach gravels in some areas, and placement of stone groins for material retention in other areas. The actions are expected to result in minimal changes to the area of intertidal habitat. However, potential adverse impacts associated with substrate changes may require mitigation through habitat gains in other areas under the alternative.

- **Adverse Impact – Alternative ASB Access Channel:** Under Alternative 8, the alignment of the marina and the placement of the marina access channel may require modification to avoid conflicts with navigation traffic associated with the federal channel. The alternative alignment will require a greater disruption to existing shallow-water areas offshore of the ASB, and will reduce the area available for habitat bench development. Additional habitat creation may be required to offset habitat impacts and mitigate for the effects of this change.

- **Beneficial Impact – ASB Habitat Gains:** Like Alternatives 5, 6 and 7, Alternative 8 provides for sludge cleanout of the ASB, including opening of the remediated facility for future aquatic uses. This enables development of nearly 4,500 linear feet of new nearshore migration corridors for juvenile salmonids, and development of over 28 acres of new open water habitat.

- **Adverse Impacts – Areas Offshore of ASB and Areas Adjacent to BST:** Under Alternative 8, sediment removal is conducted in areas offshore of the ASB, including the ASB shoulder area. Removal will also be conducted in Unit 6 areas near BST. Rather than construction of a cap with the positive features of a habitat bench offshore of the ASB as in other project alternatives, Alternative 8 would adversely impact habitat quality in Unit 5 by deepening significant areas of shallow-water nearshore habitat. Some deepening of nearshore habitat in Unit 6 will also occur, with additional adverse impacts to fish and wildlife. The adverse fish and wildlife impacts in these areas contribute to an overall net adverse impact finding for Alternative 8 with respect to fish and wildlife.

## Land Use, Navigation and Public Shoreline Access

The land use benefits and impacts of Alternative 8 are similar to those of Alternative 7, as shown in Table 4-2. As with Alternative 7, Alternative 8 results in a net adverse impact to land use, navigation and shoreline access.

Both Alternatives 7 and 8 conduct dredging of the Inner Whatcom Waterway based on the obsolete 1960s federal channel dimensions. That channel was established for an industrial land use pattern that is inconsistent with current zoning and redevelopment planning. Further, the infrastructure required to fully implement the 1960s industrial channel was never fully developed, resulting in shorelines in most of the Inner Whatcom Waterway area that are incapable of achieving an effective water depth consistent with the 1960s channel dimensions. These shorelines were constructed earlier based on the historical 18-foot waterway depth.

As with Alternatives 2, 3, and 7 the Implementation of Alternative 8 poses a significant source of conflict with current community land use priorities through inconsistency of dredging patterns with land use and navigation priorities, and through requirements for new hardened shoreline infrastructure to stabilize project area shorelines. If future deep-draft navigation uses are not to be performed in the Inner Waterway, then mitigation of slope instability could be performed by temporary bulkheading during the period of dredging, followed by backfilling of the dredged area with clean fill material. This approach would mitigate the land use conflict. These mitigation costs are not included in the remediation cost estimates of Alternative 8.

## Air and Noise

Alternative 8 dramatically increases the quantity of construction activities relative to the other project alternatives. Additional impacts will be associated with the construction of new shoreline infrastructure required in the Inner Whatcom Waterway. Potential impacts to area noise and air quality levels will need to be mitigated to avoid environmental impacts. However, mitigation can be accomplished through the use of best practices for project design, permitting, and construction.

As with the other project alternatives, potential mitigation measures for noise impacts include 1) contractual requirements to avoid exceedances of ambient noise level restrictions, 2) contractor use of appropriate equipment including mufflers as required, and 3) use of appropriate work periods if required to comply with noise level restrictions.

Air quality impacts associated with capping activities could be experienced either through emissions from construction equipment, or through dust from temporary stockpiles of capping material prior to placement. These impacts can be mitigated through 1) contractual requirements to avoid impacts to air quality, 2) the use of appropriate equipment meeting applicable air quality control requirements, 3) the use of appropriate construction measures (e.g., wetting or covering of cap material stockpiles to control fugitive dust emissions, or 4) the direct supply of cap material by barges to the capping site. These mitigation measures should be incorporated during project design and permitting.

## Cultural Resources

Alternative 8 involves extensive dredging activities, including dredging at the head of the Whatcom Waterway in the area near Citizens Dock. This was an area that was identified during previous archaeological assessment activities as potentially containing undisturbed historical or cultural resources. Potential measures to mitigate impacts to these resources would need to be developed during project design and permitting. This would likely be performed as part of the Section 106 consultations as part of Army Corps of Engineers permitting. This consultation would also cover other site areas, though the potential for presence of undisturbed cultural or historical resource in these other areas is much lower.

# 5 Pilot Comparative Evaluation of Remedial Alternatives

In addition to its strict SEPA regulatory role, this FSEIS also evaluates each of the eight FS alternatives and the SEPA No Action alternative for its consistency with the seven goals of the Bellingham Bay Demonstration Pilot. Consistency with these goals is not required under MTCA or SMS regulations. However, the Pilot Goals capture the results of over ten years of coordinated cleanup, source control, and habitat restoration planning in Bellingham Bay. Alternatives that have a high degree of consistency with the Pilot goals are considered to provide greater overall benefits relative to the stated priorities of the Pilot team members.

The Pilot analysis of alternatives summarized in this Section is different from MTCA or SEPA in that it is not required under existing regulatory authorities. Consistency with the Pilot Comprehensive Strategy and the Pilot Goals is voluntary. However, the use of the Pilot goals provides an additional basis by which the qualitative benefits or short-comings of a remedial alternative can be measured.

## 5.1 Seven Baywide Pilot Goals

As described in Section 2.2 of this document, the Bellingham Bay Demonstration Pilot was established in 1996 with the stated mission to use a new cooperative approach to expedite source control, sediment cleanup and associated habitat restoration in Bellingham Bay. The Pilot Team included regulatory and resource agencies, the City of Bellingham, the Port of Bellingham, the Lummi Nation, the Nooksack Tribe and other key community groups and stakeholders. The Pilot included an unprecedented level of community involvement and public outreach activities.

Using consensus-based decision-making, the Pilot Team established seven "baywide" goals that it wanted to ultimately achieve. The goals were formally adopted by the multi-agency work group in 1997. The seven Pilot goals are as follows:

> ***Goal 1 – Human Health and Safety:*** *Implement actions that will enhance the protection of human health.*
>
> ***Goal 2 – Ecological Health****: Implement actions that will protect and improve the ecological health of the bay.*
>
> ***Goal 3 – Protect and Restore Ecosystems:*** *Implement actions that will protect, restore or enhance habitat components making up the bay's ecosystem.*

***Goal 4 – Social and Cultural Uses:*** *Implement actions that are consistent with or enhance cultural and social uses in the bay and surrounding vicinity.*

***Goal 5 – Resource Management:*** *Maximize material re-use in implementing sediment cleanup actions, minimize the use of non-renewable resources, and take advantage of existing infrastructure where possible instead of creating new infrastructure.*

***Goal 6 – Faster, Better, Cheaper:*** *Implement actions that are more expedient and more cost-effective, through approaches that achieve multiple objectives.*

***Goal 7 – Economic Vitality:*** *Implement actions that enhance water-dependent uses of shoreline property.*

## 5.2 Pilot Evaluation of Alternatives

Table 5-1 summarizes the results of the comparative evaluation and ranking of the remedial alternatives performed using the seven "baywide" Pilot goals. As shown in Table 5-1, each of the alternatives was qualitatively ranked under each of the seven goals based on the ability of the alternative to further that goal. Qualitative rankings were applied as either "Low," "Medium," or "High." A "high" ranking indicates that the alternative provides better progress toward that Pilot goal than other alternatives ranked as "Low," or "Medium."

The following discussion presents the composite Pilot rankings for each of the eight RI/FS alternatives and the No Action Alternative, along with a summary of key differences among the alternatives.

With the exception of Goals 1, 2, and 6 the Pilot rankings of the alternatives are developed independent of the MTCA rankings performed in the FS Report. In the FS Report, the alternatives are evaluated against MTCA criteria, and preferred cleanup alternatives are identified using a disproportionate cost analysis (refer to Section 7.3 of the FS Report). That analysis defines the extent of active remedial measures that are considered "permanent to the maximum extent practicable" as defined under MTCA. The analysis of environmental protectiveness performed in this document using Pilot Goals 1 and 2 (Human Health and Safety, and Ecological Health) incorporates the output of the MTCA analysis, and the analysis of Goal 6 (Faster, Better, Cheaper) considers the analysis of disproportionate costs as one element of the evaluation. Refer to Section 7 of the FS Report for additional information regarding the MTCA analysis of remedial alternatives.

## 5.2.1 No Action Alternative

Pilot rankings for the No Action Alternative are summarized in Table 5-1. The overall Pilot ranking for the No Action Alternative is low, based on the average of the seven individual rankings. Individual rankings are discussed below:

- **Goals 1 & 2 (Human Health & Safety & Ecological Health):** The No Action Alternative ranked low for Goal 1 and Goal 2. The No Action Alternative does not ensure compliance with MTCA cleanup levels protective of human health and the environment. Therefore, low rankings are applicable.

- **Goal 3 (Habitat Protection & Restoration):** The No Action Alternative was ranked low under Goal 3. Under the No Action Alternative, shallow-water habitat areas at the head and along the sides of the Inner Whatcom Waterway would not be disturbed by dredging or other remediation measures. This lack of disturbance provides a habitat benefit in the short term. However, this habitat benefit is offset by the lack of environmental protectiveness of the alternative. Further, the alternative does not provide any long-term protection of the habitat areas, nor does it actively restore or enhance habitat in other areas, as in other project alternatives. For these reasons, the low ranking is appropriate.

- **Goal 4 (Social & Cultural Uses):** The No Action Alternative receives a low ranking for Goal 4, because the Alternative does not support revitalization of the Bellingham Waterfront. Under the No Action Alternative, environmental effects of impacted sediments will continue, and liability uncertainty will hamper potential navigation or land use improvements within and in waterfront areas of the site.

- **Goal 5 (Resource Management):** The No Action Alternative ranks low for Goal 5. In theory the No Action Alternative represents a significant cost savings relative to the costs of the remedial alternatives, and conserves resources by not taking action. However, the No Action alternative does not achieve site cleanup, does not support planned land and navigation uses, and will encumber the use of existing properties and waterfront infrastructure. These “hidden” costs are significant for the No Action Alternative, and justify the low ranking of this Alternative.

- **Goal 6 (Faster, Better, Cheaper):** As with Goal 5, the No Action Alternative receives a low ranking under the Faster, Better Cheaper Goal. Though the alternative provides short-term cost savings over the other more costly alternatives, the No Action Alternative does not address environmental protection, and does not address the long-term waterfront land and navigation uses. While the No Action Alternative is "cheap" it is clearly not "better" with respect to environmental protection, habitat or land use benefits. Costs of mitigating the adverse impacts of the No Action Alternative would be substantial. These mitigation costs justify additional cleanup actions even if Goal 6 is viewed in isolation from the other Pilot Goals.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Under Goal 7 the No Action Alternative receives a low ranking, because the alternative is not consistent with planned land or navigation uses for either the Whatcom Waterway or the ASB area. The Alternative would adversely affect the economic vitality of the Bellingham Waterfront area, and would adversely affect future shoreline land use.

### 5.2.2 Alternative 1

Alternative 1 rankings are summarized in Table 5-1. The overall Pilot ranking for Alternative 1 is low, based on the average of the seven individual rankings. Individual rankings are discussed below:

- **Goals 1 & 2 (Human Health & Safety and Ecological Health):** Alternative 1 received a low composite ranking under the Pilot evaluation. The Alternative ranked medium for Goal 1 (human health & safety) and Goal 2 (ecological health). Though the cleanup is expected to comply with MTCA cleanup levels protective of human health and the environment, the alternative does not conduct cleanup using solutions considered to be permanent to the maximum extent practicable under MTCA. Therefore, Alternative 1 does not receive a high ranking under these two goals.

- **Goal 3 (Habitat Protection and Restoration):** Alternative 1 was ranked medium under Goal 3. Under Alternative 1, shallow-water habitat areas are preserved at the head and along the sides of the Inner Whatcom Waterway, and capping produces a beneficial change in sediment elevation and energy levels in the area offshore of the ASB. However, the alternative does not facilitate the removal of Inner Whatcom Waterway bulkheads or over-water structures as in Alternatives 5 and 6, nor does it achieve restoration of aquatic uses for the ASB as in Alternatives 5 through 8.

- **Goal 4 (Social and Cultural Uses):** Alternative 1 receives low rankings for Goal 4, because the dredging plan for the Inner Whatcom Waterway is not consistent with land use and navigation planning for this area, and the capping of the ASB is inconsistent with planned aquatic reuse of the ASB.

- **Goal 5 (Resource Management):** Alternative 1 ranks low for Goal 5. Alternative 1 conserves resources by minimizing construction activity. However, Alternative 1 impedes the continued use of the existing deep draft navigation infrastructure present at the Bellingham Shipping Terminal.

- **Goal 6 (Faster, Better, Cheaper):** For Goal 6 Alternative 1 receives a low ranking. Though the alternative provides short-term cost savings over the other more costly alternatives, Alternative 1 does not address planned waterfront land and navigation uses. Therefore, this alternative is cheaper, but is not necessarily better.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Under Goal 7 Alternative 1 receives a low ranking, because the alternative is not consistent with planned land or navigation uses for either the Whatcom Waterway or the ASB area. The relatively long restoration time for this Alternative will also hinder community redevelopment activities in waterfront areas.

### 5.2.3 Alternative 2

Alternative 2 rankings are summarized in Table 5-1. The overall Pilot ranking for Alternative 2 is medium, based on the average of the seven individual rankings. Individual rankings are discussed below:

- **Goals 1 & 2 (Human Health & Safety and Ecological Health):** Alternative 2 ranked medium for Goal 1 and Goal 2. Though the cleanup is expected to comply with MTCA cleanup levels protective of human health and the environment, the alternative does not conduct cleanup using solutions considered to be permanent to the maximum extent practicable under MTCA. Therefore, Alternative 2 does not receive a high ranking under these two goals.

- **Goal 3 (Habitat Protection and Restoration):** Alternative 2 receives a high ranking under Goal 3. Alternative 2 produces negative habitat impacts in the Inner Whatcom Waterway, through the removal of emergent shallow-water habitat from the head and sides of the waterway, and the triggering of shoreline infrastructure requirements that further affect habitat quality in the Inner Whatcom Waterway. The Alternative does not restore aquatic habitat within the ASB. However, Alternative 2 creates new premium shallow-water aquatic habitat at the Cornwall CAD facility, offsetting other habitat losses and providing an anticipated net gain of nearshore habitat. The high ranking under Goal 3 is based on this anticipated net gain in nearshore habitat for Alternative 2.

- **Goal 4 (Social and Cultural Uses):** Alternative 2 receives a low ranking under Goal 4 (social and cultural uses) because the dredging plan for the Inner Whatcom Waterway is not consistent with planed mixed-use redevelopment of this area, and because the alternative triggers shoreline infrastructure requirements that are in conflict with area land use and navigation plans. The deep dredging performed under this alternative results in potential disturbances to cultural or historical resources in the former Citizen's Dock area at the head of Whatcom Waterway. Alternative 2 also does not support planned aquatic reuse of the ASB.

- **Goal 5 (Resource Management):** Alternative 2 receives a medium ranking under Goal 5. Alternative 2 minimizes the use of non-renewable fuel resources required to transport dredged materials off of the waterfront. However, Alternative 2 triggers the creation of new infrastructure that will be costly to create, will produce redundancies with the existing infrastructure present at the Bellingham Shipping Terminal, and will be in conflict with community land use plans for the Inner Whatcom Waterway.

- **Goal 6 (Faster, Better, Cheaper):** Alternative 2 receives a medium ranking under Goal 6. While the costs of the alternative are lower than those of Alternatives 5 and 6, this cost-effectiveness is eliminated after the costs of additional shoreline infrastructure requirements are taken into account. Further, the alternative does not capture new funding sources (i.e., marina revenues) which the Port plans to apply to offset a portion of the cleanup costs for the ASB area under Alternatives 5 through 8.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Under Goal 7 Alternative 2 receives a low ranking, because the alternative is inconsistent with planned land or navigation uses for either the Whatcom Waterway or the ASB area.

### 5.2.4 Alternative 3

Alternative 3 rankings are summarized in Table 5-1. The overall Pilot ranking for Alternative 3 is medium, based on the average of the seven individual rankings. Individual rankings are discussed below:

- **Goals 1 & 2 (Human Health & Safety and Ecological Health):** Alternative 3 ranks medium for Goals 1 and 2. The cleanup is expected to comply with MTCA cleanup levels protective of human health and the environment, but the alternative does not conduct cleanup using solutions considered to be permanent to the maximum extent practicable under MTCA.

- **Goal 3 (Habitat Protection and Restoration):** Alternative 3 receives a low ranking under Goal 3. Alternative 3 produces negative habitat impacts in the Inner Whatcom Waterway, through the removal of emergent shallow-water habitat from the head and sides of the waterway, and the triggering of shoreline infrastructure requirements that further affect habitat quality in the Inner Whatcom Waterway. The Alternatives does not restore aquatic habitat within the ASB. The Alternative includes some enhancement of habitat quality offshore of the ASB.

- **Goal 4 (Social and Cultural Uses):** Alternative 3 receives a low ranking under Goal 4 because the dredging plan for the Whatcom Waterway is not consistent with planed mixed-use redevelopment of this area, and because the alternative triggers shoreline infrastructure requirements that are in conflict with area land use and navigation plans. The deep dredging performed under these alternatives results in potential disturbance to cultural or historical resources in the former Citizen's Dock area at the head of Whatcom Waterway. Alternative 3 also does not support planned aquatic reuse of the ASB.

- **Goal 5 (Resource Management):** Alternative 3 receives a medium ranking under Goal 5. Alternative 3 minimizes the use of non-renewable fuel resources required to transport dredged materials off of the waterfront. However, Alternative 3 triggers the creation of new infrastructure that will be costly to create, will produce redundancies with the existing infrastructure present at the Bellingham Shipping Terminal, and will be in conflict with community land use plans for the Inner Whatcom Waterway.

- **Goal 6 (Faster, Better, Cheaper):** Alternative 3 receives a medium ranking under Goal 6. While the costs of the alternative are lower than those of Alternatives 5 and 6, this cost-effectiveness is eliminated after the costs of additional shoreline infrastructure requirements are taken into account. Further, the alternative does not capture new funding sources (i.e., marina revenues) which the Port plans to apply to offset a portion of the cleanup costs under Alternatives 5 through 8.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Under Goal 7 Alternative 3 receives a low ranking, because the alternative is inconsistent with land use and navigation requirements for either the Whatcom Waterway or for the ASB area. Alternative 3 creates a new fill that will be encumbered by geotechnical and environmental use restrictions.

### 5.2.5 Alternative 4

Alternative 4 rankings are summarized in Table 5-1. The overall Pilot ranking for Alternative 4 is medium, based on the average of the seven individual rankings. Individual rankings are discussed below:

- **Goals 1 & 2 (Human Health & Safety and Ecological Health):** As with Alternatives 1-3, the Alternative 4 complies with cleanup standards, but does not use permanent solutions to the maximum extent practicable. This results in medium rankings under Pilot Goals 1 and 2.

- **Goal 3 (Habitat Protection and Restoration):** The ranking against Goal 3 is medium. Alternative 4 preserves and restores some nearshore, shallow-water habitat within the Inner Whatcom Waterway and offshore of the ASB, but the alternative does not provide the extent of habitat restoration provided in Alternatives 5 and 6.

- **Goal 4 (Social and Cultural Uses):** Alternative 4 earns a “medium” ranking under Goal 4. The alternative provides for multiple uses of the Whatcom Waterway consistent with land use and navigation planning, and avoids disturbance of potential historical and cultural resources at the head of the Whatcom Waterway near former Citizen’s dock. However, the alternative does not support planned aquatic reuse of the ASB.

- **Goal 5 (Resource Management):** Alternative 4 receives a medium ranking for Goal 5. Alternative 4 reduces the non-renewable resources consumed during construction activities, and avoids the redundant shoreline infrastructure requirements of alternatives 2 and 3. However, Alternative 4 does not restore productive reuse of the ASB area.

- **Goal 6 (Faster, Better, Cheaper):** Alternative 4 receives a medium ranking for Goal 6. While the alternative can be implemented quickly, and the project is cost-effective, the alternative does not achieve restoration of aquatic uses within the ASB, and does not provide the degree of habitat, navigation and public access enhancements achieved by Alternatives 5 and 6. Further, the alternative does not capture the additional funding source (marina revenues) of these other alternatives.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Alternative 4 achieves partial consistency with shoreline land use priorities, and receives a “medium” ranking under Pilot Goal 7. The alternative tailors the dredging and shoreline modifications within the

Whatcom Waterway to the multi-purpose channel concept. However, the alternative does not restore aquatic uses of the ASB.

### 5.2.6 Alternative 5

Alternative 5 rankings are summarized in Table 5-1. The overall Pilot ranking for Alternative 5 is high, based on the average of the seven individual rankings. Individual rankings are discussed below:

- **Goals 1 & 2 (Human Health & Safety and Ecological Health):** Cleanup under Alternative 5 is conducted using solutions that are permanent to the maximum extent practicable under MTCA, resulting in high rankings under Goals 1 and 2.

- **Goal 3 (Habitat Protection and Restoration):** Alternative 5 receives a high ranking under Goal 3 because it results in net habitat benefits in the Whatcom Waterway, offshore of the ASB, and within the ASB. Under Alternatives 5 and 6, the ASB is cleaned up and then reconnected to Bellingham Bay. This restores nearly 4,500 linear feet of salmonid migration corridor, and opens approximately 28 acres of open water habitat.

- **Goal 4 (Social and Cultural Uses):** Alternative 5 also ranks high under Goal 4. The alternative enhances social and cultural uses by directly supporting revitalization of the Bellingham waterfront. The cleanup actions within the ASB and the Whatcom Waterway are consistent with and directly support community navigation, land use and habitat enhancement plans, while avoiding potential disruption of cultural and/or archaeological resources that may exist in the former Citizens Dock area at the head of the Whatcom Waterway.

- **Goal 5 (Resource Management):** Alternative 5 receives a "high" ranking under Pilot Goal 5. The alternative uses significant energy resources to accomplish project construction. However, these resources are used appropriately to manage the most heavily-contaminated materials requiring cleanup, and the cleanup action provides for reuse of the clean ASB berm materials. Alternative 5 avoids the creation of redundant shoreline infrastructure (as in Alternatives 2 and 3) that conflicts with area land use priorities. Further, the Alternative supports productive reuse of the ASB.

- **Goal 6 (Faster, Better, Cheaper):** Under Goal 6, Alternative 5 is ranked high because it provides a high-quality cleanup action consistent with planned land uses, while maintaining overall cost-effectiveness. The cleanup actions of Alternative 5 are more costly than Alternatives 1-4, but overall costs are reasonable if mitigation costs and land use impacts are considered as part of the analysis.

Additionally, Alternative 5 provides for planned aquatic reuse of the ASB, which is expected to generate additional revenues (marina moorage fees) that help offset the costs of ASB sludge removal.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Alternative 5 receives a high ranking for Goal 7 by enhancing water-dependent uses of shoreline property, providing for a full range of waterfront uses, and contributing to the revitalization of Bellingham Bay waterfront.

### 5.2.7 Alternative 6

Alternative 6 rankings are summarized in Table 5-1. The overall Pilot ranking for Alternative 6 is high, based on the average of the seven individual rankings.

Most elements of Alternative 6 are the same as for Alternative 5. The principal difference is that Alternative 6 conducts additional deep dredging adjacent to the Bellingham Shipping Terminal, reducing the area of capping required within Whatcom Waterway. This additional dredging results in some increases to project costs, but with a corresponding potential benefit to future navigation uses at Bellingham Shipping Terminal, should additional navigation depths be required. Therefore, the additional costs of Alternative 6 do not affect rankings of the alternative under Goals 5 (resource management), or under Goal 6 (faster, better, cheaper). Individual rankings are discussed below:

- **Goals 1 & 2 (Human Health & Safety and Ecological Health):** Cleanup under Alternative 6 is conducted using solutions that are permanent to the maximum extent practicable under MTCA, resulting in high rankings under Goals 1 and 2.

- **Goal 3 (Habitat Protection and Restoration):** Alternative 6 receives a high ranking under Goal 3 because it results in net habitat benefits in the Whatcom Waterway, offshore of the ASB, and within the ASB. Under Alternatives 5 and 6, the ASB is cleaned up and then reconnected to Bellingham Bay. This restores nearly 4,500 linear feet of salmonid migration corridor, and opens approximately 28 acres of open water habitat.

- **Goal 4 (Social and Cultural Uses):** Alternative 6 also ranks high under Goal 4. The alternatives enhance social and cultural uses by directly supporting revitalization of the Bellingham waterfront. The cleanup actions within the ASB and the Whatcom Waterway are consistent with and directly support community navigation, land use and habitat enhancement priorities, while avoiding potential disruption of cultural and/or archaeological resources that may exist in the former Citizens Dock area at the head of the Whatcom Waterway.

- **Goal 5 (Resource Management):** Alternative 6 receives a "high" ranking under Pilot Goal 5. The alternative uses significant energy resources to accomplish project construction. However, these resources are used appropriately to manage the most heavily-contaminated materials requiring cleanup. The cleanup action provides for reuse of the clean ASB berm materials, and provides for productive reuse of the ASB. Alternative 6 avoids the creation of redundant shoreline infrastructure that conflicts with area land use priorities in Alternatives 2, 3, 7 and 8.

- **Goal 6 (Faster, Better, Cheaper):** Under Goal 6, Alternative 6 is ranked high because it provides a high-quality cleanup action consistent with planned land uses, while maintaining overall cost-effectiveness. The cleanup actions of Alternative 6 are more costly than Alternatives 1-4, but overall costs are reasonable if mitigation costs and land use impacts are considered as part of the analysis. Additionally, Alternative 6 provides for planned aquatic reuse of the ASB, which is expected to generate additional revenues (marina moorage fees) that help offset the costs of ASB sludge removal.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Alternative 6 receives a high ranking for Goal 7 by enhancing water-dependent uses of shoreline property, providing for a full range of waterfront uses, and contributing to the revitalization of Bellingham Bay waterfront.

### 5.2.8 Alternative 7

Alternative 7 rankings are summarized in Table 5-1. The overall Pilot ranking for Alternative 7 is medium, based on the average of the seven individual rankings.

- **Goals 1 & 2 (Human Health & Safety and Ecological Health):** Alternative 7 receives high rankings for Goals 1 and Goal 2, because the level of cleanup meets or exceeds MTCA requirements for use of permanent solutions to the maximum extent practicable. The use of dredging and upland disposal beyond the point considered the maximum extent practicable under MTCA does not affect the rankings against these goals, though it does impact the rankings under Goal 6.

- **Goal 3 (Habitat Protection and Restoration):** Alternative 7 receives a medium ranking under Goal 3. Alternative 7 enhances habitat quality through aquatic reuse of the ASB, and through creation of a cap and habitat bench offshore of the ASB. However, the deep dredging of the 1960s industrial channel removes emergent shallow-water habitat at the head and along the sides of the Inner Whatcom Waterway, and triggers requirements for hardened shoreline infrastructure that further limit habitat quality in this area.

- **Goal 4 (Social and Cultural Uses):** The ranking of Alternatives 7 against Goal 4 is low. The dredging of the 1960s federal channel and the associated requirements for hardened shoreline infrastructure are inconsistent with area land use and navigation planning, and could disturb historical or archaeological resources that may be present near the former Citizen's Dock area.

- **Goal 5 (Resource Management):** Ranking under Goal 5 is low, due to the higher consumption of non-renewable fossil fuel resources during dredging and infrastructure construction, and due to likely redundancy of newly-constructed infrastructure with existing infrastructure at the Bellingham Shipping Terminal.

- **Goal 6 (Faster, Better, Cheaper):** Alternative 7 receives a low ranking for Goal 6, because costs of this alternative are substantially higher than those of Alternative 6, while environmental, land use and habitat benefits are equivalent or lower. This poor cost/benefit relationship is compounded when the costs of required shoreline infrastructure are incorporated into project estimates, and associated land use and environmental impacts are considered.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Alternative 7 receives a low ranking for Goal 7 due to the poor cost-effectiveness of the alternative, and due to the conflicts between the alternative and planned land uses in the Inner Whatcom Waterway.

### 5.2.9 Alternative 8

Alternative 8 rankings are summarized in Table 5-1. The overall Pilot ranking for Alternative 8 is low, based on the average of the seven individual rankings.

- **Goals 1 & 2 (Human Health & Safety and Ecological Health):** Alternative 8 receives a low composite ranking relative to the seven Pilot criteria. Rankings for Goal 1 and for Goal 2 were high, because the level of cleanup meets or exceeds MTCA requirements for use of permanent solutions to the maximum extent practicable. However, the use of dredging and upland disposal well beyond the point at which it is considered practicable under MTCA results in a very low rankings for Goal 6 (faster, better, cheaper).

- **Goal 3 (Habitat Protection and Restoration):** Alternative 8 receives a low ranking under Goal 3. Alternative 8 removes emergent shallow-water habitat from the head and sides of the Inner Whatcom Waterway. In addition, Alternative 8 converts shallow-water habitat in portions of Units 5 and 6 to less-productive deep-water habitat, rather than enhancing habitat quality as in preceding alternatives. Despite habitat enhancements conducted within the ASB, this alternative likely results in a net loss of premium nearshore aquatic habitat, resulting in the low ranking under Goal 3.

- **Goal 4 (Social and Cultural Uses):** The ranking of Alternative 8 against Goal 4 is low. The dredging of the 1960s industrial channel and the associated requirements for hardened shoreline infrastructure are inconsistent with area land use and navigation planning in the Inner Whatcom Waterway area. The dredging at the head of the Waterway could disturb historical or archaeological resources that may be present near the former Citizen's Dock area.

- **Goal 5 (Resource Management):** Ranking under Goal 5 is low, because Alternative 8 has the highest consumption of non-renewable fossil fuel resources during dredging and infrastructure construction, and because the new shoreline infrastructure will likely be redundant with existing infrastructure at the Bellingham Shipping Terminal.

- **Goal 6 (Faster, Better, Cheaper):** Alternative 8 receives a very low ranking for Goal 6 because costs of this alternative are between three and four times higher than the Alternatives 5 and 6, without producing a significant enhancement to site environmental conditions or other benefits. This poor cost-effectiveness is compounded when the costs of required shoreline infrastructure are incorporated into project estimates. The costs of Alternative 8 are well beyond identified funding mechanisms for the project.

- **Goal 7 (Economic Vitality, Shoreline Land Use):** Alternative 8 receives a low ranking for Goal 7 due to the very poor cost-effectiveness of the alternative, and due to the conflicts between the alternative and planned land uses in the Inner Whatcom Waterway. The relatively long restoration time for this Alternative will also hinder community redevelopment activities in waterfront areas.

# 5.3 Conclusions of Pilot Evaluation

The Pilot analysis of alternatives summarized in Section 5.2 is different from MTCA or SEPA in that it is not required under existing regulatory authorities. Consistency with the Pilot Comprehensive Strategy and the Pilot Goals is voluntary. However, the use of the Pilot goals provides an additional basis by which the qualitative benefits or short-comings of a remedial alternative can be measured.

Based on the Pilot evaluation as documented in Table 5-1, the two alternatives that provide the greatest overall benefits are Alternatives 5 and 6. These two alternatives are roughly equivalent to each other. Significant findings from the Pilot evaluation for these and the other alternatives are as follows:

- **No Action Alternative:** The Pilot evaluation resulted in very low rankings for the No Action Alternative. That alternative received low rankings under all seven of the individual Pilot Goals. The Pilot analysis suggests that even in the absence of MTCA and SMS requirements (which prevent use of the No Action Alternative at the site), further consideration of the No Action Alternative is not warranted.

- **Alternative 1:** A low Pilot ranking was also identified for Alternative 1. Alternative 1 received medium rankings for Goals 1, 2 and 3 (Human Health & Safety, Ecological Health and Habitat Protection & Restoration). However, this was offset by low rankings for other Pilot Goals 4 through 7 (Social & Cultural Uses; Resource Management; Faster, Better, Cheaper; and Economic Vitality, Shoreline Land Use).

- **Alternatives 2, 3 and 4:** Alternatives 2, 3 and 4 all ranked medium under the Pilot evaluation. These alternatives all ranked medium for Goals 1 and 2 (Human Health & Safety and for Ecological Health). The alternatives all received medium rankings for Goals 5 and 6 (Resource Management and Faster, Better, Cheaper), reflecting the cost-effectiveness of these alternatives relative to some other project alternatives. Alternatives 2 and 3 ranked low for Goals 4 and 7 (Social & Cultural Uses and Economic Vitality & Shoreline Land Use), because these alternatives conflict with planned land uses both within the Inner Whatcom Waterway and also within the ASB. The greatest differences in rankings between Alternatives 2, 3 and 4 were noted with respect to Goal 3 (Habitat Protection & Restoration). Habitat Protection and Restoration rankings varied from high (Alternative 2) to low (Alternative 3), reflecting the significant differences in net environmental impacts/benefits of these alternatives to fish and wildlife habitat.

- **Alternatives 5 and 6:** Alternatives 5 and 6 received the highest rankings against the Pilot goals. These alternatives received high rankings under each of the seven Pilot Goals. High rankings under Goals 1 and 2 (Human Health & Safety and Ecological Health) were achieved because cleanup is conducted to the maximum extent practicable as defined under MTCA. High rankings under Goal 3 (Habitat Protection and Restoration) were achieved, because these alternatives provide the greatest restoration benefits of any of the project alternatives. The remedies are specifically tailored to planned waterfront land uses, resulting in high rankings for Goals 4 and 7 (Social & Cultural Uses and Economic Vitality & Shoreline Land Uses). High rankings under goals 5 and 6 (Resource Use and Faster, Better Cheaper) apply to Alternatives 5 and 6. While the probable costs of the remedial alternatives are higher than Alternatives 1-4, these costs are proportionate to environmental, habitat and land use benefits achieved under Alternatives 5 and 6. Furthermore, some of the incremental mitigation costs and resource requirements incurred for Alternatives 2 and 3 are avoided. Finally, Alternatives 5 and 6 provide an opportunity to capture additional funding sources (i.e., moorage revenues) to help offset the costs of remediation.

- **Alternatives 7 and 8:** Alternatives 7 and 8 are the two highest-cost alternatives. Alternative 7 was ranked medium against the Pilot Goals, and Alternative 8 was ranked low. Both of these alternatives ranked high for Goals 1 and 2 (Human Health and Safety and Ecological Health), because they conduct cleanup to at least the level considered permanent to the maximum extent practicable under MTCA, as with Alternatives 5 and 6. However, Alternative 7 received only medium rankings for Goal 3 (Habitat Protection and Restoration). Alternative 7 is considered to roughly balance habitat impacts and benefits. Alternative 8 receives a low ranking under Goal 3, because Alternative 8 appears to produce a net loss of premium nearshore habitat. The two alternatives ranked low for Goals 4 and 7 (Social & Cultural Uses and Economic Vitality, Shoreline Land Use) due to the conflicts between the cleanup alternatives and planned navigation and land uses. Alternatives 7 and 8 received low rankings for Goals 5 and 6 (Resource Management and Faster, Better, Cheaper) because of the disproportionately high costs of the alternatives relative to the environmental, land use and habitat benefits of the alternatives.

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# APPENDIX A

## SUBAREA STRATEGIES FROM THE 2000 COMPREHENSIVE STRATEGY EIS

These sub-area strategies were included as Appendix A to the 2000 Comprehensive Strategy EIS. These sub-area strategies have not been updated to reflect the changes taking place on Bellingham's waterfront. Ecology has indicated that these sub-area strategies are to be updated following completion of community land use planning efforts.

# A SUBAREA STRATEGIES

## A.1 DEFINING SUBAREAS AND SHORELINE SEGMENTS

Nine subareas are defined as distinct geographic units in Bellingham Bay, and are consistent with designations called out in the City of Bellingham's Shoreline Management Program (Figure A-1). Three of these subareas, West Bay, South Bay, and Marine, are large uniform areas of relatively undeveloped shoreline. The other six areas have a wide range of shoreline uses. In these six subareas, the areas are further separated into shoreline segments that reflect difference in uses along the shoreline within a subarea. The number of shoreline segments varies depending on the number of times shoreline uses and/or habitat features change within a subarea.

## A.2 DEVELOPING THE STRATEGY

Each project element has been inventoried within a subarea – sediment sites and source control, sediment disposal siting, habitat, and land use. Following the inventory, an analysis was made to determine whether or not there are overlapping issues within a subarea or shoreline segment. If an overlap occurred, an effort was made to determine if the overlap represented a conflict between two or more competing uses, or if it represented an opportunity to combine two or more complementary uses. Using an overlay matrix, areas of conflicting or competing uses were identified. The Subarea Strategies provide guidance and direction on how to resolve these conflicts. The strategies also help determine which project element(s) are the critical ones given a shoreline segment, and identify where a balance may need to occur within a subarea.

The Subarea Strategies consist of the following components:

- *Subarea Description* –Defines the geographical extent of the subarea, the key features, the character of the shoreline at the land/water edge. The description also identifies the general ecological functions within the subarea and the prominent land uses.
- *Recommended Strategy* – Key strategy statement for the subarea
- *Primary Uses* – Defines the existing primary use(s) within a subarea.
- *Project Elements* – A list of activities/opportunities that are consistent with the recommended strategy is presented separately for each of the four project elements. Those activities that are part of the Near-Term Remedial Action Alternatives are identified.

Two of the key features of the Subarea Strategies are balance and flexibility. Frequently, conflicting uses require that Subarea Strategies reflect a balance between land use and habitat. Due to the configuration of the inner bay – with two federally-authorized navigation channels terminating in urban stream estuaries – striking a balance between habitat and land use is often noted as important component of the Subarea Strategies. Flexibility is an important part of the Subarea Strategies because of the difficulty in predicting with any certainty what the future land use development scenarios will be. Maintaining flexibility is achieved in some of the subareas by the strategy statements for a subarea often reflecting a water-dependent commercial land-use orientation, without pointing to a specific project.

The Subarea Strategies are presented in this Appendix. A map that identifies the key characteristics of the subarea accompanies each strategy. Examples of restoration opportunities within each subarea are shown on these maps with numerical references. The brief description of these restoration opportunities is provided in Table A-1.

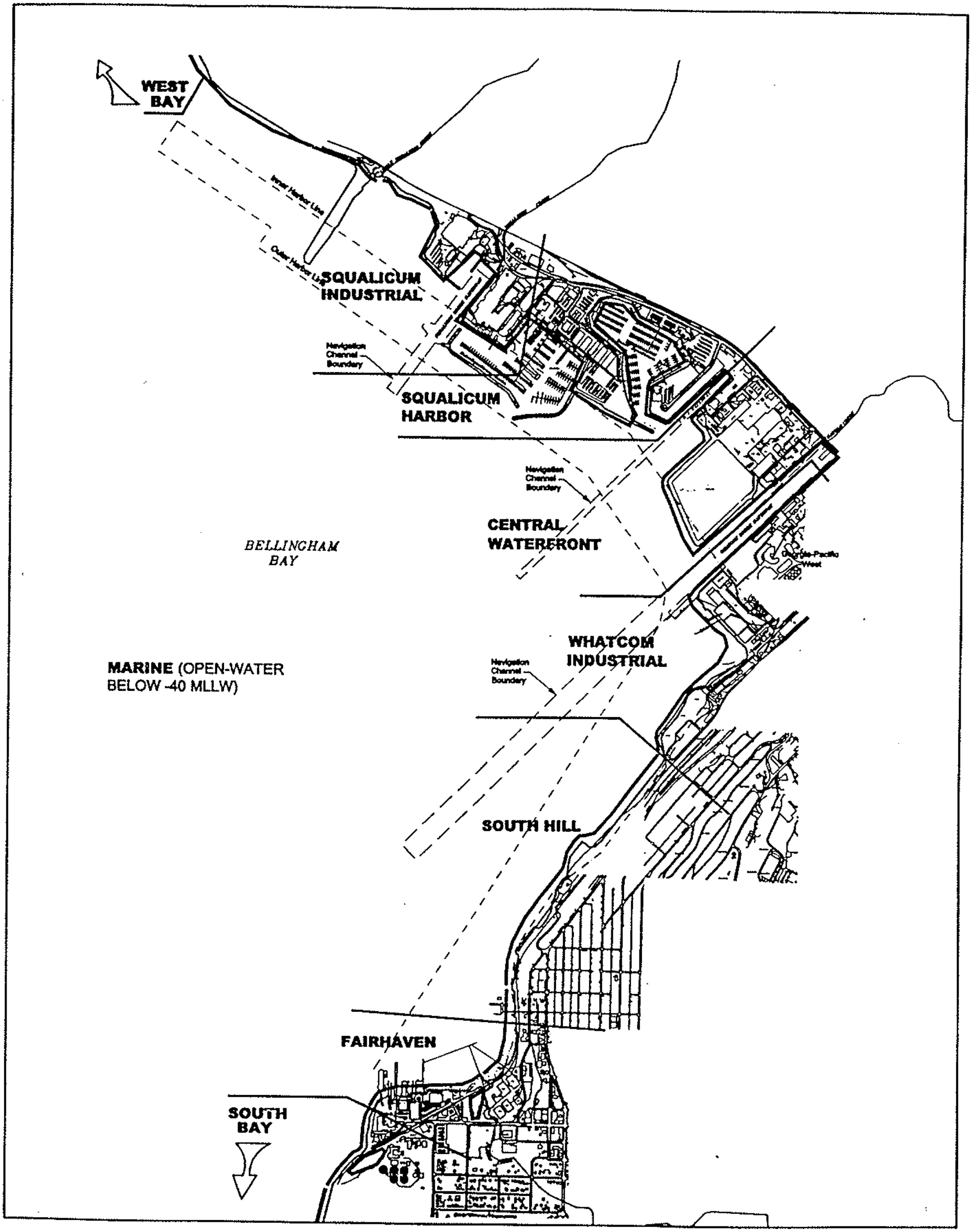


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**Figure A-1**
Comprehensive Strategy Subareas

**Table A-1 Habitat Action Descriptions** (Refer to the attached maps for location of numbered actions)

| No. | Habitat Area to be Gained in $ft^2$ (acres)[1] | Name | Description |
|---|---|---|---|
| 1 | 38,000 $ft^2$ (0.87) | Cement Co. Dock | The cement company dock is a relatively wooden structure near Little Squalicum Creek. It extends through intertidal and shallow subtidal water. The primary action would be removal of the treated wooden piles (probably cut below the mud line) to remove creosote from the aquatic environment and restore substrates. |
| 2 | 30,000 $ft^2$ (0.68) | Mt. Baker Plywood West | The beach area west of Mt. Baker Plywood consists of large boulders and rocks. Opportunities at this site include either removing the large boulders and rocks to expose underlying sediments and supplement with finer mixed coarse gravel and sand, or placing finer mixed coarse gravel and sand over the large boulders and rocks to fill interstices. |
| 3 | 30,000 $ft^2$ (0.68) | Mt. Baker Plywood Northwest | A portion of the shoreline appears to be fill. The fill could be removed and the area graded to support marine buffer, possibly salt marsh and sand/mud flat. |
| 4 | 120,000 $ft^2$ (2.75) | Mt. Baker Plywood - South | The fill could be removed and the site graded to provide habitat suitable for sand/mudflat and salt marsh habitat with a marine buffer fringe. |
| 5 | 20,000 $ft^2$ (0.45) | Squalicum Crk. Waterway - A | This action would involve the removal of treated wooden piles, a pier, log rafting structures, and log rafts. |
| 6 | 200,000 $ft^2$ (4.6) | Squalicum Crk. Waterway – B | The elevations in this portion of the creek estuary could be raised to provide intertidal and shallow water habitat such as eelgrass, kelp or salt marsh and associated functions. Shoreline buffer could also be established. |
| 7 | 50,000 $ft^2$ (1.1) | Bellingham Cold Storage | The fill could be removed and the site graded to provide estuary habitat suitable for marine buffer, saltmarsh and/or intertidal mud/sandflat. |
| 8 | 640,000 $ft^2$ (14.7) | Squalicum Harbor Breakwater | Elevations off portions of the breakwater could be raised from about -18 ft MLLW to provide gently sloping intertidal and shallow subtidal habitat and functions. Side slopes on the seaward edge of the breakwater could be modified to incorporate finer grained material to provide intertidal/shallow water functions. |
| 9 | 70,000 $ft^2$ (1.6) | Squalicum Marina | The substrates along the marina margins could be modified to incorporate finer grained material to provide intertidal/shallow water functions. |
| 10 | 160,000 $ft^2$ (3.6) (area available outside of existing eelgrass bed) | Port-Hilton Harbor | Shallow water habitat could be established by raising the elevation next to the ASB. Marine buffer fringe habitat could be established at high elevations and/or site elevations could me modified to meet the elevations of the existing eelgrass bed. Allow for natural eelgrass colonization or do limited eelgrass transplanting. |
| 11 | 280,000 $ft^2$ (6.4) | G-P ASB – East | Shallow water habitat could be established by raising the elevation next to the ASB. Marine buffer fringe habitat could be established at high elevations and the site could support either marsh plants or eelgrass at lower elevations. |
| 12 | 960,000 $ft^2$ (22) | G-P ASB – South | Elevations could be raised or modified to expand the existing eelgrass bed on the west side of the ASB. About 200, 000 CY would be required to create habitat at elevations suitable for eelgrass. |
| 13 | 1,430,000 $ft^2$ (33) | GP – ASB | This action would consist of removing the ASB from the water and establishing intertidal and shallow subtidal habitat, and marine buffer and/or eelgrass. |

| No. | Habitat Area to be Gained in $ft^2$ (acres)[1] | Name | Description |
|---|---|---|---|
| 14 | 30,000 $ft^2$ (0.68) | Sash & Door | This action would involve removing fill from the Sash and Door site and establishing estuarine riparian buffer, marsh, and mudflat banks. |
| 16 | <10,000 $ft^2$ (<0.23) | Lower Whatcom Creek | The action would involve removing wooden structures, derelict floats, etc. in the vicinity. |
| 17 | 60,000 $ft^2$ (1.4) | Head of Whatcom Waterway | The concept would be to modify elevations and substrates in the head of the waterway to establish estuarine riparian buffer, mudflat benches, and marsh. Perhaps introduce rootwads or other structure to the head of the waterway. |
| 18 | 270,000 $ft^2$ (6.2) | G-P Log Pond | The concept would be to modify the shoreline elevations to provide a gently sloping or terraced slope from the top of the bank to the pierhead line in the Whatcom Waterway. Remove and debris, treated wooded structures. Establish marine buffer fringe, mudflat banks and/or saltmarsh. |
| 19 | 1,080,000 $ft^2$ (24.8) | Port Log Raft | Remove wood/bark debris, and sunken logs. Modify the shoreline edge and modify elevations to support intertidal and shallow subtidal habitat (sloped or terraced bench). The site may provide an opportunity to provide substrates suitable for macroalgae attachment establish and/or an eelgrass bed. |
| 20 | 350,000 $ft^2$ (8) | Cornwall Avenue Landfill - Shoreline/Upland/in-water | Remove garbage from the in-water portion of the landfill. Cut back bank along shoreline and remove garbage. Re-grade upland to intercept an appropriate shallow water elevation. Establish intertidal habitat, marine buffer fringe, possibly a saltmarsh, and potentially expand the sparse eelgrass patches (0.25 acre) just offshore of the seaward extent of the garbage. |
| 21 | 45,000 $ft^2$ (1.03) (1st action)<br>360,000 $ft^2$ (8.3) (2nd action) | Boulevard Park | Two actions could occur along the shoreline and offshore from about 600 to 800 ft north of Boulevard Park to the south end of the Park. The first action is shoreline substrate modification. Substrates consist of rip-rap and large rock and concrete debris. These substrates could possibly be removed and replaced with coarser grain sand and gravel to provide surf smelt and sand lance spawning areas. Alternatively, finer grained substrates could be placed in the interstices to provide some epibenthic habitat. The second action would occur offshore and consist of potentially restoring eelgrass or providing substrates to support kelp. |
| 22 | 18,000 $ft^2$ (0.41) | Taylor Street Dock and Associated Structures | Remove the treated wooden structure and associated pilings and pier structures to remove creosote from the aquatic environment. Either allow eelgrass to naturally recolonize or conduct eelgrass transplant. |
| 23 | 8,000 $ft^2$ (0.18) | Padden Creek - North Shoreline | Remove shoreline fill and create mudflat and/or saltmarsh. |
| 24 | 1,500 $ft^2$ (0.03) | Padden Creek - North - In-Water | Remove treated wooden pier to remove creosote from the environment. This may provide an opportunity for existing eelgrass beds to expand. Remove a small filled area that protrudes waterward of the OHW line at the landward end of the pier structure. |
| 25 | 120,000 $ft^2$ (2.75) | Padden Creek – Upland | Remove fill and establish connection to Padden Creek. Excavate fill to create tidally influenced brackish marsh. Provide habitat buffer. |
| 26 | 80,000 ft2 (1.8) | Post Point – Upland | Excavate upland next to a small open water embayment containing eelgrass. Grade excavated area to provide saltmarsh and mudflat bench. |
| 27 | 900 ft2 (0.02) | Post Point – Shoreline | Modify existing structure under railroad crossing to open it up and replace existing concrete debris that has been used to armor |

| No. | Habitat Area to be Gained in ft² (acres)[1] | Name | Description |
|---|---|---|---|
| | | | the shoreline with rock. |
| 28 | 900 ft2 (0.02) | Post Point – South | Modify existing structure under railroad crossing to open it up. |
| 29 | 900 ft2 (0.02) | Chuckanut Spit | There is apparently a closed culvert under the rail trestle. The action would involve either opening the culvert or replacing the culvert with a new culvert that was bigger and more open. |
| 30 | 7,500 ft2 (0.17) | Chuckanut Breach | There is one rail trestle allowing exchange between Bellingham Bay and the embayment in the north end of Chuckanut Bay. The action would consist of either installing a large open culvert under the rail line or building another trestle along the eastern end of the rail bed. |
| 31 | 21,200,000 ft2 (486) | Post Point to Chuckanut Protection | Set this area aside as a preservation area because habitats within the area are difficult to replace, the area provides multiple functions (as documented through maps showing use of the area by multiple resources), and it is thought to represent a unique habitat in Bellingham Bay. |
| 32 | 75,000,000 ft2 (1,722) | Portage Island Protection Area | Set this area aside as a preservation area because habitats within the area are difficult to replace, the area provides multiple functions (as documented through maps showing use of the area by multiple resources), and it is thought to represent a unique habitat in Bellingham Bay. |
| 33 | 900,000 ft2 (20) | Lummi Peninsula | Portions of the shoreline along this area are armored with rip-rap and large boulders. The action that could be implemented here would consist of restoring upper intertidal substrates to coarse sand and gravel suitable to support surf smelt and sand lance spawning habitat. (the Lummi Nation, Corps, and County are proposing to armor the entire beach for road protection. Mitigation for maintaining surf smelt spawning habitat and functions lost from the revetment will be required by WDFW. This opportunity may not be a viable option for the Pilot). |
| 34 | 140,000,000 ft² (3,214) | Nooksack Delta Protection Area | Set this area aside as a preservation area because habitats within the area are difficult to replace, the area provides multiple functions (as documented through maps showing use of the area by multiple resources), and it is thought to represent a unique habitat in Bellingham Bay. |
| 35 | 170,000 ft² (3.9) | Nooksack Delta - East | Decaying wood deposits have apparently blanketed much of the higher intertidal area. The action would be to remove the wood deposits and if necessary import appropriately sized gravel to support surf smelt and sand lance spawning habitat. |
| 36 | | East Shore Padden Creek | Remove fill, asphalt, and rock along the east shore and modify elevations to provide estuarine riparian buffer, mudflat benches, and marsh. |

NSF = nearshore fill
CAD = confined aquatic disposal site
ASB = aerated stabilization basin

## A.3 WEST BAY SUBAREA

### Subarea Description

This subarea (Figure A-2) extends from Portage Island, along the east side of the Lummi Peninsula, past the Nooksack delta, to the beginning of the Harbor Area designation west of Little Squalicum Creek. The shoreline is predominately undeveloped in this subarea. The water/land interface from the eastern end of the subarea to the west side of the Nooksack River delta is generally gently-sloped beach consisting of sand, gravel, and cobble with boulders at the landward edge. The Nooksack River delta is predominately sand and mudflat and salt marsh. From the western edge of the Nooksack River delta to the southern end of Lummi Peninsula, the shoreline is relatively gently sloped gravel and cobble beach with rip-rap at the landward edge. Portions of higher beach within this subarea are documented surf smelt and sand lance spawning grounds. The Nooksack River delta and its associated habitats support feeding and refuge for finfish and shellfish, and transitional habitat for outmigrating juvenile salmonids. The majority of this subarea is designated as Conservancy under the County SMP, and the Nooksack River delta and Lummi Peninsula are Tribal Trust lands. Some homes have also been built along the Lummi Peninsula shoreline.

## Recommended Strategy

Protect and enhance habitat and natural resource production in this area; support County Conservancy designation, and support tribal and local government efforts to address Nooksack River water quality, sediment, and flooding issues.

### *Primary Uses*

The primary uses in this subarea are (1) natural resource production and habitat protection and enhancement, and (2) subsistence, cultural and ceremonial uses associated with the Lummi and Nooksack tribes.

### *Land Use*

Land use activities/opportunities present in this subarea consistent with the recommended strategy are:

- Provide for environmentally compatible public access.
- Support sustainable subsistence/ceremonial/spiritual tribal uses.
- Provide for recreational opportunities such as fishing, bird watching, and other types of recreational uses compatible with this subarea's environmental designation.
- Provide for aquaculture opportunities that do not degrade habitat and water quality.
- Continue to provide for commercial, recreational, and tribal fishing.
- Coordinate with Whatcom County to ensure that any future SMP designation changes are compatible with the recommended strategy for this subarea.

### *Habitat*

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Support the habitat protection status "enforced" by the Lummi Nation in the area in the vicinity of the Nooksack River estuary and in the vicinity of Portage Island (should be implemented as a near-term action)
- Protect eelgrass habitat
- Protect natural processes that create and maintain habitat
- Provide for no net loss and/or a net gain of marine aquatic habitat area/function consistent with the Draft Mitigation Framework
- Protect existing herring, surf smelt, and sand lance spawning habitats in this subarea and in particular, protect surf smelt and sand lance spawning habitat along the

Lummi Peninsula shoreline through beach nourishment (should be implemented as a near-term action)

- Upland watershed planning efforts by the tribe and local government efforts should continue to address Nooksack River water quality, sediment, and flooding issues

***Sediment Sites, Cleanup, Disposal, and Source Control***

No contaminated sediment site issues occur in this subarea. Sedimentation issues are of concern due to the high volume of sediments that are carried into the bay from associated land management practices in the Nooksack River watershed.

- Upland watershed planning efforts should continue to address point and non-point source contribution to water and sediment quality degradation. The *Sediment Site and Source Control Documentation Report* further addresses the linkage between this issue and other regional efforts/programs.

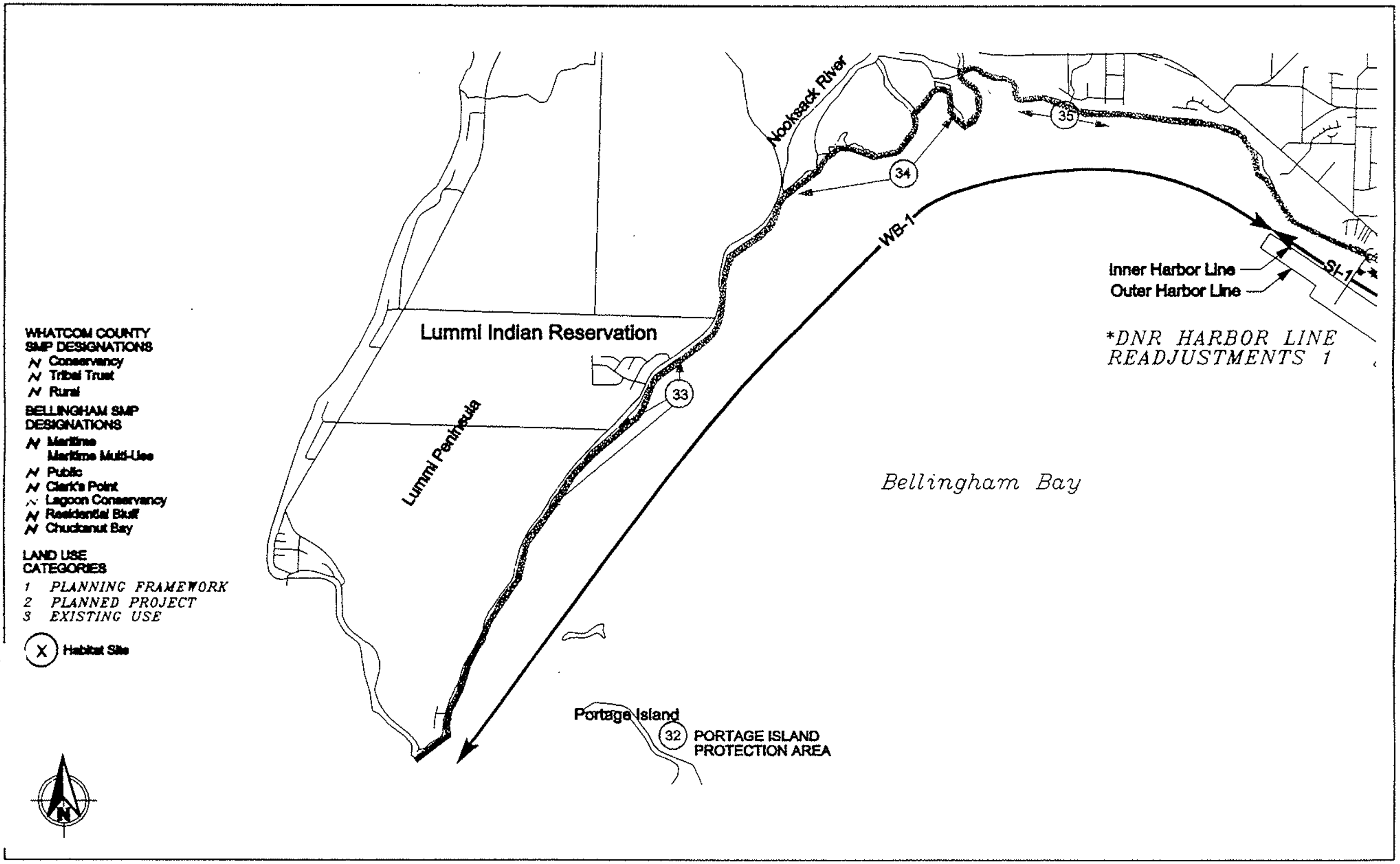


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**Figure A-2**
West Bay Subarea

## A.4 SQUALICUM INDUSTRIAL SUBAREA

### Subarea Description

This subarea (Figure A-3) extends from the beginning of the existing Harbor Area designation west of Little Squalicum Creek to the change in shoreline designation from Maritime Multi-Use to Maritime at the eastern boundary of the Weldcraft site. The shoreline along this subarea is predominately developed for commercial and industrial uses. The shoreline (approximately 800 feet) east of the Cement Plant Dock is gently sloped sand and gravel beach with boulders at the landward edge. The shoreline in the remainder of the subarea is primarily artificial (e.g., bulkheads, rip-rap). The Little Squalicum and Squalicum creeks drain into the bay in this subarea. Some salt marsh and mudflat habitat occurs in the Squalicum Creek estuary. These creeks and their estuaries, although relatively altered, provide some habitat function such as feeding and transitional habitat for finfish. The shoreline is designated as Conservancy west of the Cement Plant Dock, and shoreline is relatively undeveloped. East of the Cement Plant Dock, there are two shoreline designations: Public and Maritime. Characteristics of this subarea include:

- Harbor Area Designation
- Cement Plant Dock
- Public Trail System
- Mt. Baker Plywood
- Federal Navigation Channel
- Bellingham Cold Storage
- Weldcraft Sediment Site
- Squalicum Shipyard Site

### Recommended Strategy

Integrate current and future land uses with habitat and natural resources occurring in the area by using innovative project and source control designs for water-dependent and maritime uses. Restore habitat associated with the two urban estuaries at Little Squalicum and Squalicum creeks (emphasis on Squalicum Creek) and balance this with the maritime and water-dependent commerce uses associated with the Squalicum Creek Waterway federal navigation channel. It is recommended that this balance be achieved by developing innovative projects and plans that incorporate habitat restoration and enhancements. Habitat restoration may be accomplished independent of land uses.

*Primary Uses*

Two distinct shoreline segments were identified within this subarea, and they have different primary uses.

- Shoreline Segment SI-1: Natural resource production, habitat protection and enhancement, and public access, consistent with the Public designation used in the SMP
- Shoreline Segment SI-2: Navigation and commerce uses consistent with the Maritime designation used in the SMP, water-dependent commerce uses associated with the federal navigation channel, ongoing maintenance dredging of the federal channel to

support navigation and commerce, and protection of estuarine habitat functions associated with Squalicum Creek

*Land Use*

Land use activities/opportunities present in the subarea that are consistent with the recommended strategy include:

- Evaluate the option of adjusting the Harbor Area boundary to end just west of the Cement Plant Dock (should be implemented as a near-term action)
- Future uses at the Cement Plant Dock should consider a range of options that include leaving the structure for different water-dependent commercial uses, removing it to improve habitat, modifying it to accommodate public access, or a combination of the above
- Recommend future marina development that incorporates designs to avoid, or protect and enhance the nearshore marine environment
- Provide for ongoing commercial, tribal, and recreational fishing
- Provide opportunity for future public access trail that is environmentally consistent with habitat resources or improvements made in this subarea
- Recommend future upland/shoreline development proposals incorporate designs that avoid, or protect and enhance the nearshore environment through implementation of estuarine restoration goals.
- Recommend future railroad developments incorporate designs that avoid, or protect and enhance, the nearshore marine environment

*Habitat*

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Restore estuary habitat functions and area at Squalicum Creek by possibly relocating the stream mouth to the northwest, through changes in shoreline or in-water land uses through proposed developments, and possibly through voluntary efforts
- Restore and protect natural processes that create/maintain habitat
- Provide for no net loss and/or a net gain of marine aquatic habitat area/function consistent with the Draft Mitigation Framework
- Protect existing smelt and sand lance spawning habitats
- Restore habitat functions by removing existing structures or fills through redevelopment projects, or through voluntary efforts
- Enhance habitat connectivity along the shoreline by incorporating habitat restoration and enhancements into proposed shoreline or in-water development projects

*Sediment Sites, Cleanup, Disposal, and Source Control*

Sediment sites, cleanup opportunities, and source control needs for this subarea include:

- Plan for potential need to remediate the Weldcraft site in this subarea (should be implemented as a near-term action)
- Evaluate potential woody debris in the sediments at the Squalicum Shipyard in the vicinity of Mt. Baker Plywood

- Support the evaluation of potential sources of water quality and sediment degradation associated with the Oeser site in the Little Squalicum Creek Watershed (should be implemented as a near-term action by Ecology)
- Upland watershed planning efforts in both creeks should continue to address non-point source contribution to water and sediment quality degradation. The *Sediment Site and Source Control Documentation Report* further addresses the linkage between this issue and other regional efforts/programs
- Develop stormwater treatment plan for adjacent upland areas that currently are untreated, and control sources associated with existing and proposed land uses through the use of BMPs for operations that require a discharge permit
- Evaluate the presence of phenol and 4-methylphenol in the sediments adjacent to stormwater discharges (should be implemented as a near-term action)
- Permitted NPDES discharges should remain controlled and in compliance with permit limits
- Support the evaluation of the need to modify DNR leases and uses allowed under leases if log rafting no longer occurs within the DNR lease area within this subarea

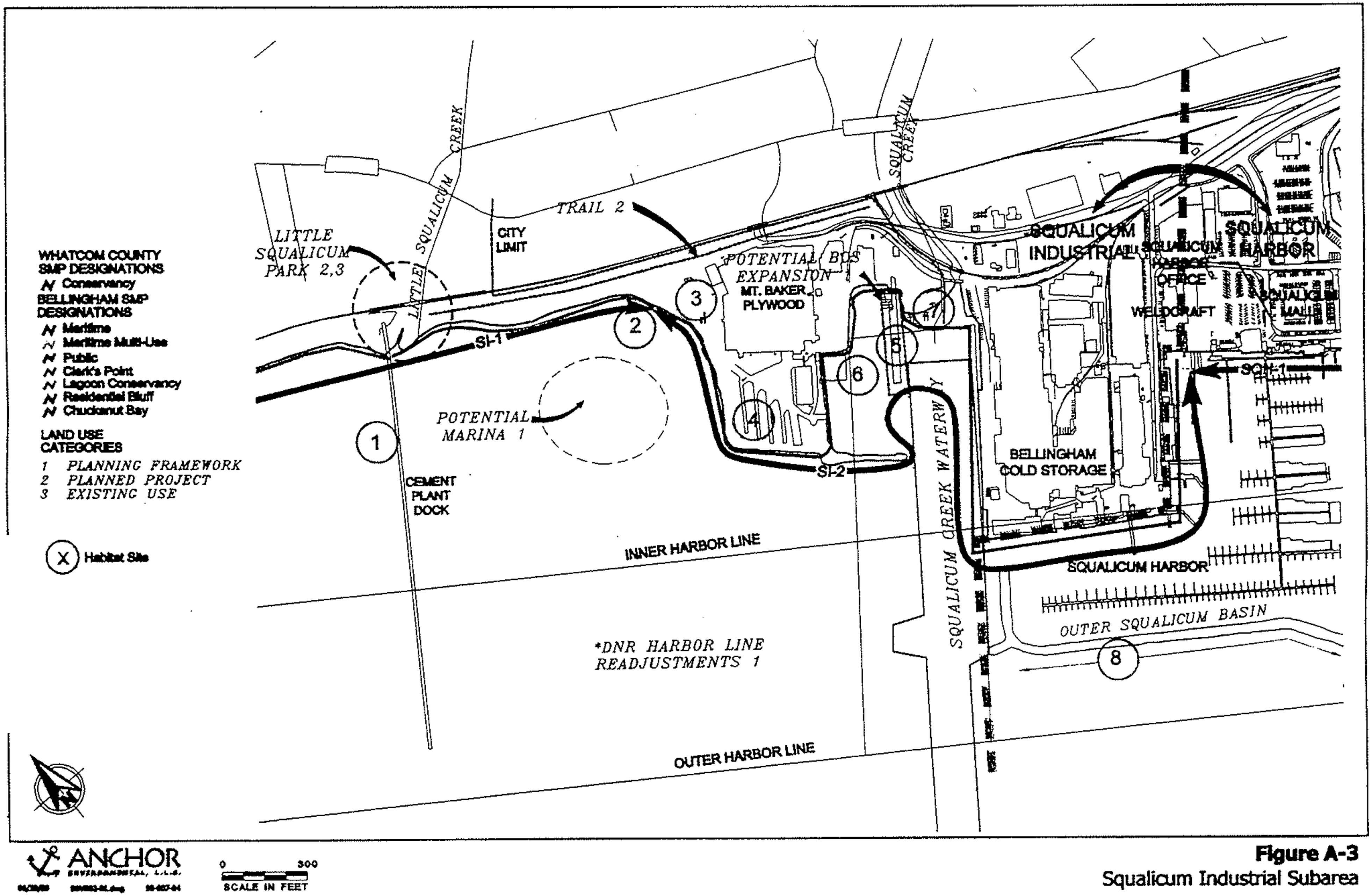



**Figure A-3**
Squalicum Industrial Subarea

## A.5 SQUALICUM HARBOR SUBAREA

### Subarea Description

This subarea (Figure A-4) extends from the change in shoreline designation from Maritime Multi-use to Maritime at the eastern boundary of the Weldcraft site to the head of the I&J Waterway. Nearly the entire shoreline along this subarea is developed for commercial and industrial uses, and consists of artificial (e.g., bulkheads, rip-rap) substrate. A small mudflat occurs at the head of I&J Waterway. No creeks drain into this subarea. Despite the developed character of the shoreline in this area, it is used as a movement and migration corridor for salmonids as part of the nearshore habitat continuum, and its substrates support some feeding function for salmonids. The shoreline is designated primarily as Maritime Multi-Use and a small area around Zuanich Park is designated as Public. Characteristics of this subarea include:

- Harbor Area Designation
- Inner and Outer Squalicum basins
- Public boat launch
- USCG station
- Zuanich Park
- Thomas Glenn Spit
- Port of Bellingham offices
- Federal Navigation Channel

### Recommended Strategy

Retain and support current marina and maritime-oriented uses. Enhance habitat connectivity across this subarea through future marina and park expansion efforts.

#### *Primary Uses*

Water-dependent and water-oriented commerce and navigation including maintenance dredging for berthing and maritime uses; with public access and recreation opportunities at the planned Zuanich Park and Thomas Glenn Spit facilities.

#### *Land Use*

Land use activities/opportunities present in this subarea that are consistent with the recommended strategy include:

- Provide opportunity for potential future marina reconfiguration and expansion
- Provide opportunity for park expansion that is compatible with maritime uses
- Provide opportunity for maritime uses along the I&J Waterway (see Central Waterfront subarea)
- Evaluate the option of adjusting the Outer Harbor Line further waterward to increase the size of the Harbor Area

***Habitat***

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Enhance the migratory corridor and connectivity through the shallow-water zone between Squalicum Creek and Whatcom Waterway Creek through modifying substrates and/or tidal elevations
- Provide for no net loss and/or a net gain of marine aquatic habitat area/function that is consistent with the Draft Mitigation Framework
- Restore habitat functions by removing existing structures or fills through redevelopment or voluntary projects
- Anticipate potential marina expansion locations when implementing habitat measures such that habitat sites and functions do not become impacted/eliminated by future expansion

***Sediment Sites, Cleanup, Disposal and, Source Control***

Sediment sites, cleanup opportunities, and source control needs for this subarea include:

- Remediate the Squalicum Harbor Inner Boat Basin contaminated sediment site (should be implemented as a near-term action)
- Evaluate the Tide-Grid site as a potential sediment site (should be implemented as a near-term action)
- Develop stormwater treatment plan for adjacent upland areas that currently are untreated, evaluate the presence of phenol and 4-methylphenol in the sediments adjacent to stormwater discharges (should be implemented as a near-term action)
- Permitted NPDES discharges should remain controlled and in compliance with permit limits

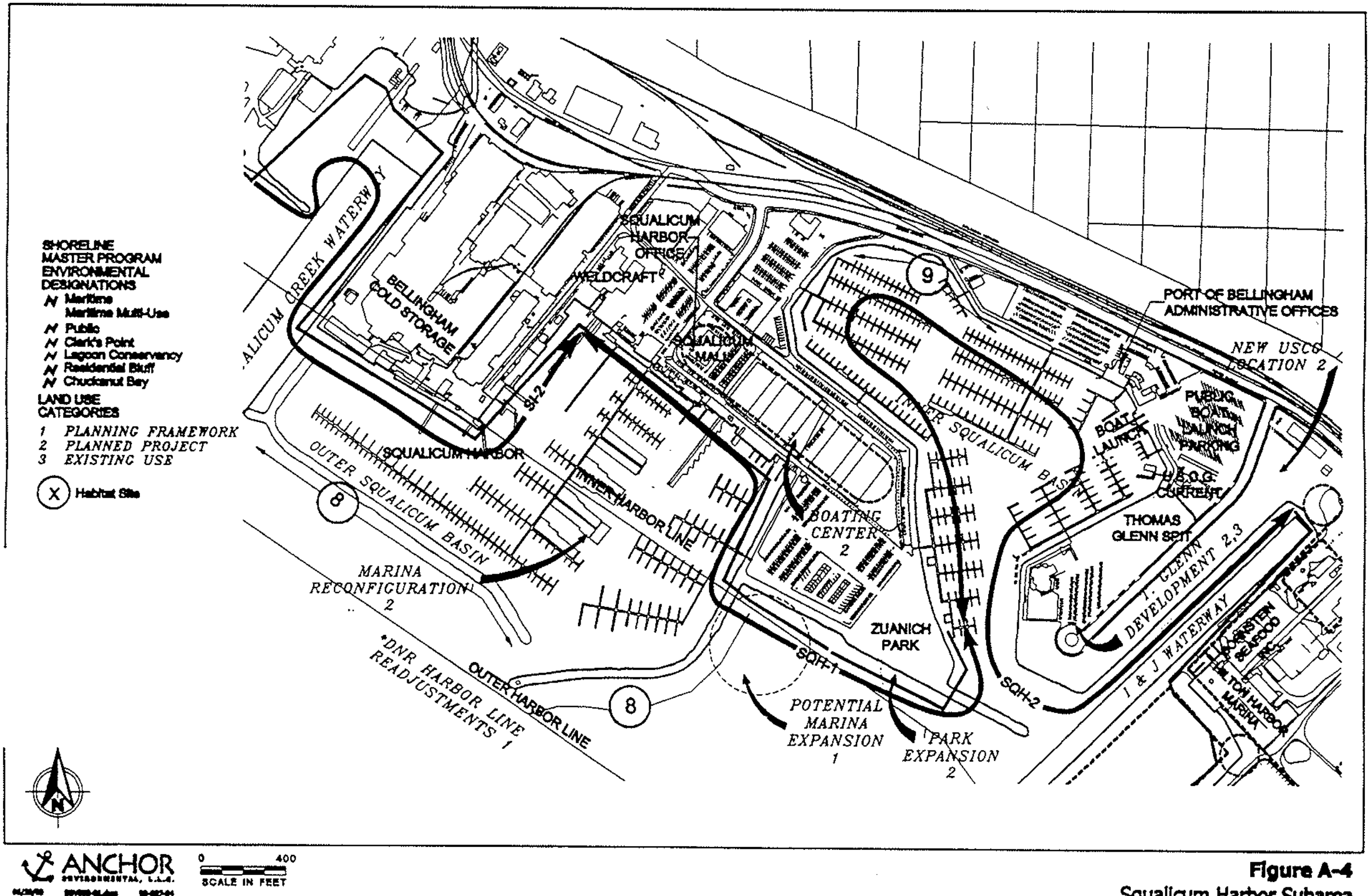



**Figure A-4**
Squalicum Harbor Subarea

## A.6 CENTRAL WATERFRONT SUBAREA

### Subarea Description

This subarea (Figure A-5) extends from the head of I&J Waterway to the northeast side of the Whatcom Waterway at the point where the authorized navigation depth in Whatcom Waterway changes from -18 to -30 feet MLLW. Nearly the entire shoreline along this subarea is developed for commercial and industrial uses, and consists of artificial (e.g., bulkheads, rip-rap) substrate. A small mudflat occurs at the head of I&J Waterway, a one to two acre mudflat occurs at the head of Whatcom Waterway, and a small sand/mudflat is located on the shoreline at the northwest corner of the G-P ASB. In this subarea, Whatcom Creek transitions to the Whatcom Creek estuary which drains into Whatcom Waterway. The creek, its estuary, and the shoreline fringe is nearshore habitat for juvenile salmonids migrating out of Whatcom Creek, and is used for feeding, possibly for refuge, and as a migration corridor. Other shoreline edges in this subarea also act as a migration corridor. The shoreline is designated as Maritime, and characteristics of this subarea include:

- Harbor Area Designation
- Federal Navigation channels
- Hilton Harbor Marina
- Bornstein Seafood, Inc.
- G-P ASB
- Citizens Dock (dilapidated)
- Central Waterfront properties
- Eelgrass bed east of the I&J Waterway and west of the G-P ASB

### Recommended Strategy

Remediate Whatcom Waterway Site sediments. Foster navigation and water-dependent commerce uses through sediment remediation strategies that provide access to the navigation channels' authorized depths. Protect critical estuarine habitat (e.g., eelgrass bed and Whatcom Creek estuary) and habitat functions by having land use, public access and sediment remediation strategies build in habitat connectivity between the Whatcom Creek stream mouth and adjacent shoreline uses, and support habitat protection and enhancement in the Whatcom Creek estuary. Provide public access opportunities at the head of Whatcom Waterway.

*Primary Uses*

The primary uses in this subarea are maritime uses and water-dependent commerce and navigation; balanced with habitat protection, Whatcom Creek estuary restoration at the stream mouth, and possible eelgrass restoration, and public shoreline use and access at the head of Whatcom Waterway.

*Land Use*

Land use activities/opportunities present in the subarea that are consistent with the recommended strategy include the following recommendations:

- Evaluate the option of adjusting the Harbor Area boundary offshore of the G-P ASB (should be implemented as a near-term action)
- Provide opportunities for potential water-dependent commercial and industrial expansion along the central waterfront
- Support efforts to consider innovative designs that avoid impacts to existing habitat and incorporate habitat enhancements as identified in the Habitat Documentation Report for future maritime and water-dependent development activities
- Provide for public access to the shoreline that is compatible with maritime uses and habitat restoration/connectivity measures, as identified in the Aquatic Land Use Documentation Report

***Habitat***

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Protect and restore Whatcom Creek estuary habitat functions and area through implementation of a Near-Term Remedial Action Alternative
- Combine sediment cleanup with habitat creation and/or enhancement through implementation of a Near-Term Remedial Action Alternative
- Restore habitat functions by removing or modifying existing structures or fills through redevelopment and/or voluntary projects
- Enhance habitat connectivity along Whatcom Creek and Whatcom Waterway
- Protect and restore eelgrass habitat between I&J Waterway and the G-P ASB

***Sediment Sites, Cleanup, Disposal, and Source Control***

There are several sediment sites, cleanup, disposal options, and source control measures within this subarea including:

- Remediate the following sediment and adjacent upland sites that are known or potential sources of contamination:
  - Whatcom Waterway Sediment Site (segregated into a number of discrete units that include: Federal Navigation Channel (-30 MLLW), Head of Whatcom Waterway (-30 MLLW), Head of Whatcom Waterway (-18 MLLW), G-P ASB, and possibly I&J Waterway) (Should be implemented as part of a Near-Term Remedial Action Alternative)
  - Olivine Sediment Site
  - Roeder Avenue Landfill Site
  - Chevron Site
  - Colony Wharf Site
- Control permitted NPDES discharges and comply with permit limits
- Ensure the stormwater discharge from the C Street outfall does not contribute to sediment or water quality degradation and evaluate this outfall as a potential source of phenol and 4-methylphenol (should be implemented as a near-term action by City)
- Support upland watershed planning efforts in Whatcom Creek that address non-point source contribution to water and sediment quality degradation, and habitat restoration and enhancement opportunities. The *Sediment Site and Source Control* and *Habitat Documentation* reports further address the linkage to other regional efforts/programs.

- Confirm with the Corps of Engineers that sediments on the surface of I&J Waterway meet the Puget Sound Dredged Disposal Analysis (PSDDA) guidelines and that these sediments may be an effective mechanism in isolating contaminants from the environment allowing a no-action approach to remediating that sediment site unit (should be implemented as a near-term action). If the results of sediment testing indicate the sediments do not pass PSDDA requirements, the recommendation is to dredge and dispose of these sediments at a CAD or upland disposal site (should be implemented as part of a Near-Term Remedial Action Alternative).
- Control disturbance to capped areas from temporary and permanent anchorage, if capping is selected method of remediation

Cleanup options within this subarea include the following. These actions are under consideration as represented by the range of Near-Term Remedial Action Alternatives:

- Removal of all contaminated sediments (where technically feasible) within the Whatcom Waterway navigation channel and outside the navigation channel
- Removal of sediments and capping within the channel sufficient to provide access to the currently authorized navigation depths; capping of areas outside the channel
- Removal of sediments and capping within the channel exclusive of the shallow areas at the head of the waterway; capping of areas outside the channel
- No action in the I&J Waterway (pending conformational biological testing)

No specific disposal site options occur in this subarea.

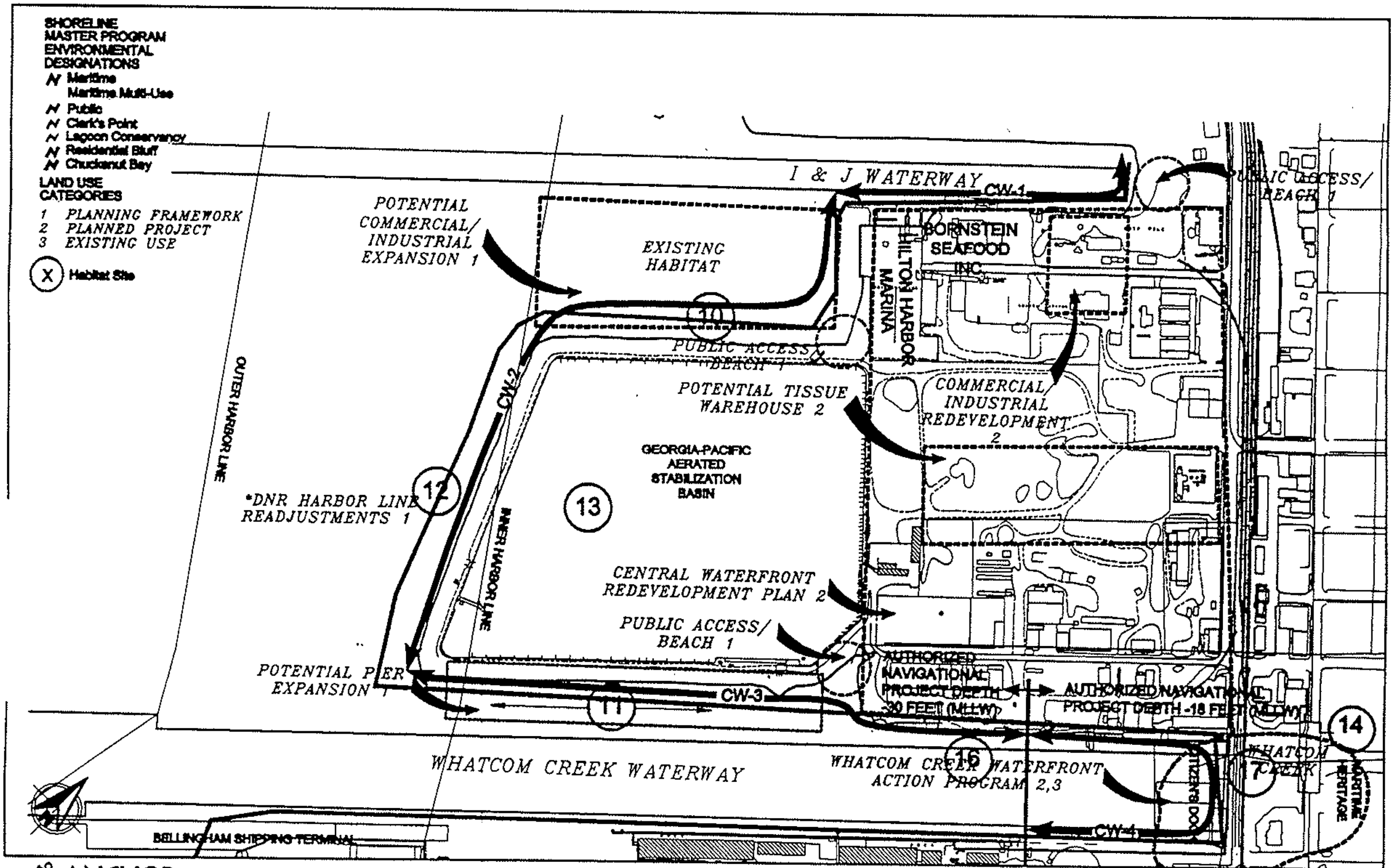



**Figure A-5**
Central Waterfront Subarea

## A.7 WHATCOM INDUSTRIAL SUBAREA

### Subarea Description

This subarea (Figure A-6) extends from the Whatcom Waterway at the point where the authorized navigation depth changes from -18 to -30 feet MLLW to the south end of the Cornwall Avenue Landfill. Nearly the entire shoreline along this subarea is developed for commercial and industrial uses, and consists of artificial (e.g., bulkheads, rip-rap) substrate. Seaward of the rip-rap shoreline at the Cornwall Avenue Landfill, the beach is primarily large cobbles and gravels with some sand. A pocket sand/mudflat occurs north of the Cornwall Avenue Landfill in the location of a potential public access beach. Juvenile salmon use the nearshore areas as migration and movement corridors and for feeding. Substrates along the shoreline at Cornwall Avenue Landfill support Pacific oysters. The shoreline is designated as Maritime, and characteristics of this subarea include:

- Harbor Area Designation
- Federal Navigation Channel
- G-P facilities including log pond
- Bellingham Shipping Terminal
- Cornwall Avenue Landfill

### Recommended Strategy

Promote maritime uses adjacent to the Whatcom navigable channel and in the vicinity of the Port Log Raft area through remediation strategies that improve access to those areas. Remediate the G-P Log Pond and Cornwall Avenue Landfill in a manner that improves estuarine habitat and connectivity between the Whatcom Waterway stream mouth and adjacent shoreline areas. In the Cornwall vicinity, consider at least one alternative that would balance maritime water-dependent uses in the northern portion of the landfill area with habitat and public shoreline access benefits in the southern portion while remediating sediment and upland solid waste conditions at the landfill.

#### *Primary Uses*

The primary uses in this subarea are maritime, water-dependent commerce, and navigation; balanced with providing habitat connectivity and public access.

#### *Land Use*

Land use activities/opportunities present in the subarea that are consistent with the recommended strategy include the following:

- Evaluate the option of adjusting the Harbor Area boundary around the Cornwall Avenue Landfill area (should be implemented as a near-term action)
- Provide opportunities for potential maritime and water-dependent activities that are designed to avoid habitat impacts and enhance habitat functions as identified in the Habitat Documentation Report

- Provide for public access to the shoreline that is compatible with maritime and navigation uses and habitat restoration/connectivity measures, as identified in the Aquatic Land Use Documentation Report

***Habitat***

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Combine sediment cleanup with habitat creation and/or enhancement through implementation of the Near-Term Remedial Action Alternative
- Enhance habitat connectivity
- Protect and restore eelgrass habitat
- Restore and protect natural processes that create/maintain habitat
- Provide for no net loss and/or a net gain of marine aquatic habitat area/function consistent with the Pilot Project mitigation framework

***Sediment Sites, Cleanup, Disposal, and Source Control***

Remediate the following sediment and adjacent upland sites:

- Whatcom Waterway Sediment Site (segregated into a number of discrete units that include: Federal Navigation Channel (-30 MLLW), Head of Whatcom Waterway (-30 MLLW), G-P Log Pond, and Port Log Raft Area) (should be implemented as part of a Near-Term Remedial Action Alternative)
- Cornwall Avenue Landfill Site
- Evaluate the contribution of woody debris from the log rafting operations
- Ensure the stormwater discharge from the Laurel Street Drain does not contribute to sediment or water quality degradation
- Disposal options that could be implemented as part of a Near-Term Remedial Action Alternative within this subarea include:
  - Constructing a CAD at the G-P Log Pond
  - Constructing a CAD over the southern portion of the Cornwall Avenue Landfill sediments
- The Near-Term Remedial Action Alternatives under consideration (represented by Alternatives 2A through 2E) include the following cleanup options:
  - Dredging all contaminated sediments within the Whatcom navigation channel and outside the navigation channel
  - Dredging all sediments (surface and subsurface) within the navigation channel; capping of areas outside the channel (i.e., Log Pond and Port Log Raft Area)
  - Dredging and capping sediments within the navigation channel such that access to the authorized channel depths is provided
  - Limited dredging of contaminated sediments in the Port Log Raft area to provide access to the Chemical Dock
  - Removal of sediments and upland waste material from the Cornwall Avenue Landfill
  - Capping of sediments and partial removal of upland wastes that occur within the shoreline
  - Capping sediments offshore from the Cornwall Avenue Landfill
  - Control disturbance to capped areas from temporary and permanent anchorage

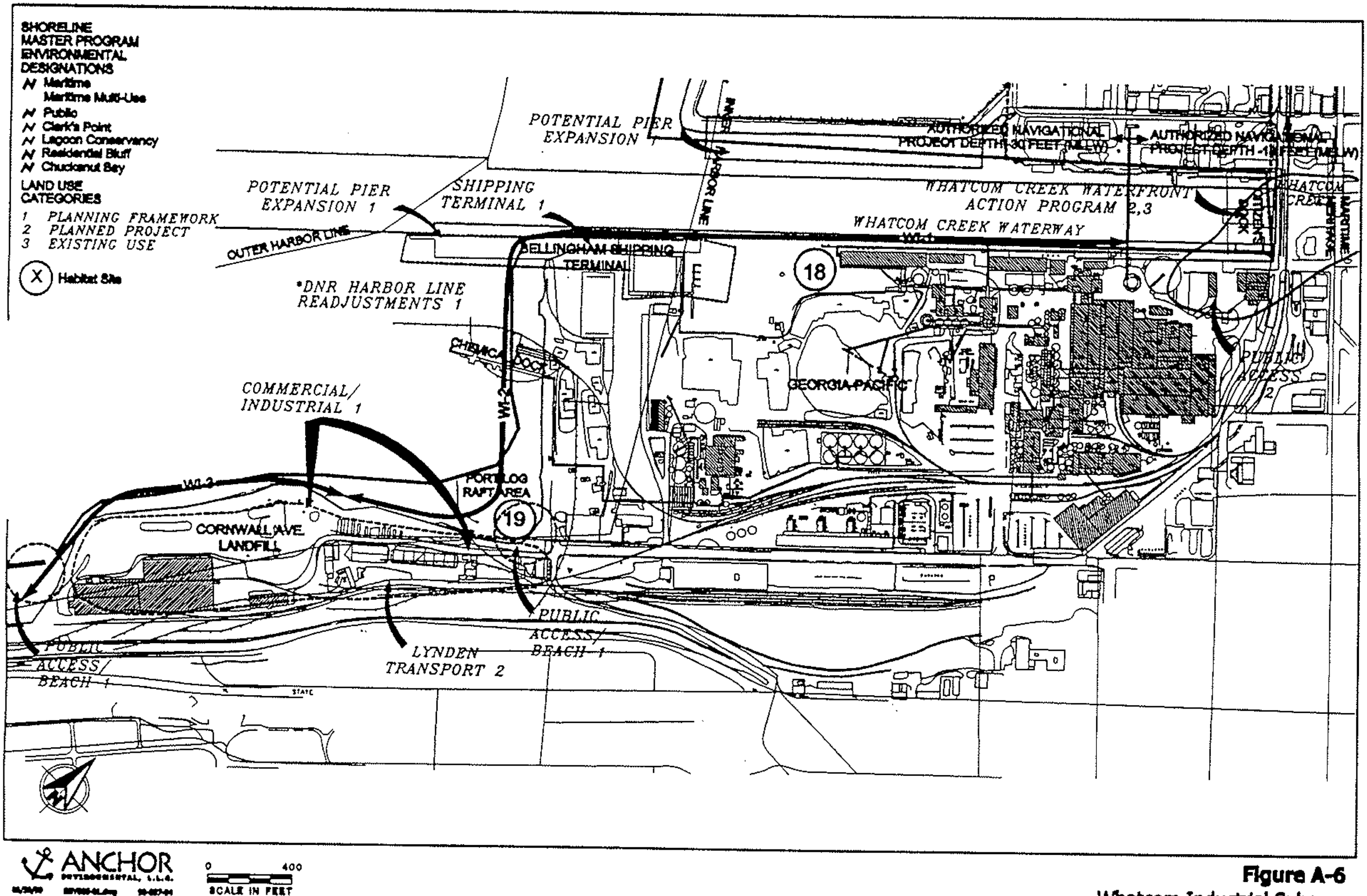



**Figure A-6**
Whatcom Industrial Subarea

## A.8 SOUTH HILL SUBAREA

### Subarea Description

This subarea (Figure A-7) extends from the south end of the Cornwall Avenue Landfill to just south of the Taylor Avenue Dock (Douglas Avenue right-of-way). The shoreline is predominately undeveloped in this subarea. The water/land interface from the south end of the Cornwall Avenue Landfill to the north end of Boulevard Park is gravel, cobble, and sand with rip-rap. Rip-rap extends along the shoreline of Boulevard Park. At the southern end of the subarea, the shoreline is cobble and gravel with rip-rap armoring at the landward edge of the rail road. No creeks drain into this subarea. Portions of the shoreline are surf smelt and sand lance spawning beaches and the entire shoreline is used by salmon as a nearshore migration corridor and for feeding. Part of the subarea is designated as Public, with Boulevard Park as an existing facility and the Taylor Avenue dock as a proposed public access park. The remaining part of the subarea (from the Bennett Street right-of-way to the BNSF trestle on the north side of the Padden Creek lagoon) is multi-use. Other characteristics within the subarea include:

- Harbor Area Designation
- Southern end of Cornwall Avenue Landfill
- Boulevard Park
- Starr Rock sediment and disposal site
- BNSF Railroad

### Recommended Strategy

Promote habitat protection and restoration opportunities, and use of the shoreline for public access and recreational purposes, and discourage commercial or industrial uses. If a Near-Term Remedial Action Alternative is implemented in this subarea, evaluate the option of constructing a CAD site that is large enough to contain all of the dredged contaminated sediment and improve habitat function to avoid creating multiple disposal sites throughout the bay. Design and locate a CAD site such that it can meet multiple objectives such as enhancing habitat, providing shoreline access, creating disposal capacity, and remediating contaminated sediments within the disposal site footprint.

#### *Primary Uses*

The primary uses in this subarea are habitat enhancement and protection, and public access.

#### *Land Use*

Land use activities/opportunities present in this subarea that are consistent with the recommended strategy include:

- Evaluate the option of moving the Inner and Outer Harbor Lines further offshore in some locations; and as appropriate remove the Harbor Area depending on whether or not a disposal site is located in a segment of the subarea (should be implemented as part of a Near-Term Remedial Action Alternative)
- Provide for public access enhancements where consistent with habitat enhancements and sediment remediation options

- Provide for public access and habitat enhancements at the Taylor Avenue Dock (should be implemented as a near-term action)

***Habitat***

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Provide for no net loss and/or a net gain of marine aquatic habitat area/function consistent with the Pilot Project mitigation framework
- Restore habitat functions by removing/modifying existing structures or fills through redevelopment and voluntary projects
- Protect and restore eelgrass habitat
- Restore and protect natural processes that create/maintain habitat
- Protect existing smelt and sand lance spawning habitats
- Enhance habitat connectivity

***Sediment Sites, Cleanup, Disposal and Source Control***

Remediate the Starr Rock Site (should be implemented as part of a Near-Term Remedial Action Alternative)

- Further evaluate the Taylor Avenue Dock site (should be implemented as a near-term action)
- Evaluate and recommend treatment of stormwater discharges as appropriate (should be implemented as a near-term action)
- Control stormwater sources associated with existing and water-dependent uses through the use of BMPs for operations that require a discharge permit
- Control disturbance to capped sediments and/or CAD from temporary and permanent anchorage
- Disposal options evaluated as part of a Near-Term Remedial Action Alternative within this subarea include:
  - Constructing a CAD at the Starr Rock site, contiguous with a CAD/cap feature at the Cornwall Avenue Landfill site (i.e., the Starr Rock/Cornwall CAD)
- The Near-Term Remedial Action Alternatives under consideration (represented by Alternatives 2A through 2E) include the following cleanup options:
  - Removing sediments from Starr Rock and taking sediments to an upland disposal site
  - Capping sediments at the Starr Rock through the construction of the Starr Rock/Cornwall CAD at that location

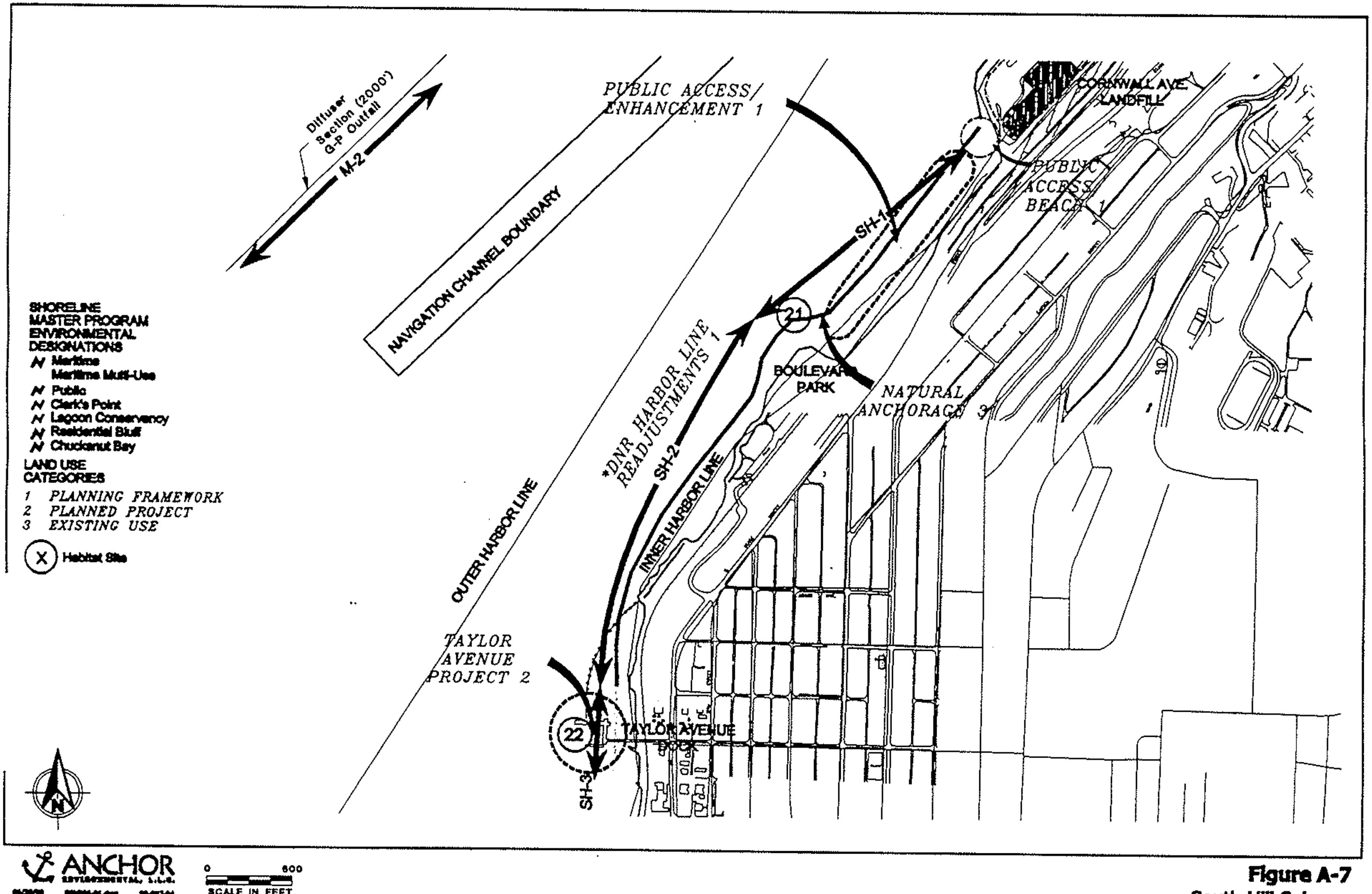



**Figure A-7**
South Hill Subarea

## A.9 FAIRHAVEN SUBAREA

### Subarea Description

This subarea (Figure A-8) extends from south of the Taylor Avenue Dock (Douglas Avenue right-of-way) to the north boundary of Marine Park. The shoreline from south of the Taylor Avenue dock to the public boat launch ramp consists primarily of cobble, gravel, and sand with rip-rap armoring at the landward edge along the rail road. The lagoon embayment (Padden Creek lagoon) is an intertidal mudflat with rip-rap along the eastern shore and vegetated park along the western shore. South of the public boat launch ramp, the shoreline is artificial (e.g., bulkheads, piers, and rip-rap). Juvenile salmon use the creek, lagoon estuary, and fringe habitat for feeding, refuge, and as a migration corridor. The remaining shoreline is also used for feeding and as a migration corridor by salmon. The subarea is designated as Maritime Multi-Use and Maritime. The shoreline in this subarea includes the following characteristics:

- Harbor Area Designation
- Padden Creek Dock and public access
- BNSF Railroad
- Public boat launch
- Barge stub pier
- Bellingham Cruise Terminal
- Harris Avenue Shipyard

### Recommended Strategy

Promote water-dependent commerce, navigation and maritime uses while protecting and enhancing habitat, particularly the Padden Creek estuary. Incorporate innovative designs into water dependent and maritime uses that protect habitat and implement habitat measures identified in the Habitat Documentation Report. Remediate sediments in a manner that promotes maritime and habitat uses. Remediate the Harris Avenue Shipyard site.

#### *Primary Uses*

The primary uses in this subarea are directly related to water-dependent commerce and navigation, and natural resource production/habitat enhancement and protection.

#### *Land Use*

Land use activities/opportunities present in this subarea that are consistent with the recommended strategy include:

- Evaluate the option of adjusting the Harbor Area boundary
- Provide for potential future marina development that is consistent with habitat protection and enhancement measures and public access goals
- Provide for existing natural anchorage (fixed buoyed system moorage); recommend no expansion of this existing use that would impact habitat
- Recommend future railroad improvements/developments incorporate designs that avoid, or protect and enhance, the nearshore marine environment

- Recommend future shoreline work associated with Padden Creek incorporates designs that avoid impacts to the marine environment and that protect or enhance marine resources

*Habitat*

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Protect and restore Padden Creek estuary habitat functions and area
- Protect and restore eelgrass habitat
- Restore and protect natural processes that create/maintain habitat
- Provide for no net loss and/or a net gain of marine aquatic habitat area/function consistent with the Pilot Project mitigation framework
- Protect existing smelt and sand lance spawning habitats
- Restore habitat functions by removing existing structures or fills through redevelopment or voluntary projects
- Enhance habitat connectivity

*Sediment Sites, Cleanup, Disposal and Source Control*

- Remediate the Harris Avenue Shipyard (should be implemented as part of a Near-Term Remedial Action Alternative)
- Ensure stormwater discharge from outfalls in the subarea do not contribute to sediment or water quality degradation
- Control stormwater sources associated with existing and water-dependent uses through the use of BMPs for operations that require a discharge permit
- Disposal options are not applicable for this subarea

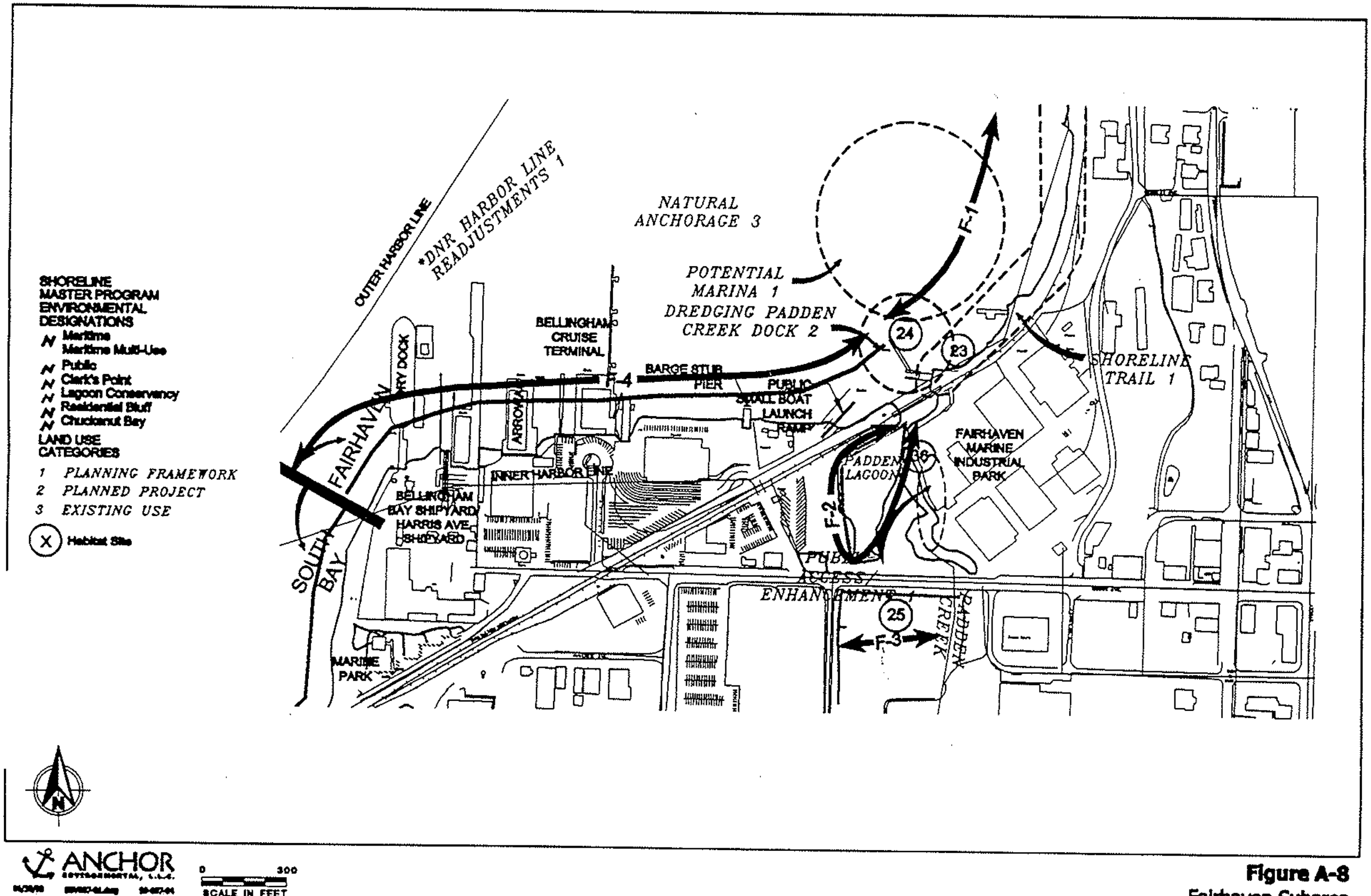



**Figure A-8**
Fairhaven Subarea

## A.10 SOUTH BAY SUBAREA

### Subarea Description

This subarea (Figure A-9) extends from the north boundary of Marine Park to Governor's Point. The shoreline in this subarea is relatively undeveloped and is primarily used for public access and residential development. The water/land interface consists primarily of cobble, gravel, and sand with boulders and rip-rap. There are three pockets of mudflat lagoons, the largest being Chuckanut Creek lagoon. Chuckanut Creek enters into the Chuckanut Lagoon estuary and supports salmon. The creek, lagoons, and fringe habitat is used for feeding, refuge and as a migration corridor for salmon. The lagoons may also function as rearing areas for young salmon. The shoreline in this area is designated as Residential Bluff, Clarks' Point, Lagoon Conservancy, and Chuckanut Bay. Key land use features include:

- Marine Park
- City of Bellingham Post Point Waste Water Treatment Plant (WWTP)
- BNSF Railroad

### Recommended Strategy

Protect and enhance habitat and natural resource production in this area; and maintain residential, conservation, and public access uses.

*Primary Uses*

The primary uses in this subarea are residential housing, conservancy of natural resources, public access, natural resource production, and habitat protection and enhancement.

*Land Use*

Land use activities/opportunities present in the subarea that are consistent with the recommended strategy include:

- Maintain the environmentally compatible WWTP operation
- Provide for environmentally compatible public access
- Provide for recreational opportunities consistent with habitat protection and enhancement measures
- Provide opportunities for commercial, tribal, and recreational fishing
- Evaluate the option of removing the Harbor Area designation to exclude this subarea (the harbor area designation should terminate immediately south of the WWTP; should be implemented as a near-term action)
- Future railroad developments need to acknowledge the importance of protecting and enhancing the nearshore marine habitats and incorporate elements into projects that enhance natural resources

***Habitat***

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Create a habitat protection area in the vicinity of Post Point
- Enhance and increase the lagoon habitat at the Post Point WWTP in coordination with the City (should be implemented as a near-term action)
- Protect and restore eelgrass
- Protect Chuckanut Creek estuary habitat functions and area
- Restore and protect natural processes that create/maintain habitat
- Provide for no net loss and/or a net gain of marine aquatic habitat area/function consistent with the Pilot Project mitigation framework
- Restore habitat functions by removing/modifying existing structures or fills through redevelopment or voluntary projects

***Sediment Sites, Cleanup, Disposal and Source Control***

No sediment site issues for this area.

- Support the progress made by the WWTP in maintaining discharge performance in compliance its NPDES permit
- Upland watershed planning efforts in Chuckanut Creek should address non-point source contribution to water and sediment quality degradation. The *Sediment Site and Source Control Documentation Report* further addresses the linkage to other regional efforts/programs
- Encourage County Health Department to address potential septic source control issue at Chuckanut Village

There are no cleanup options or disposal sites in this subarea.

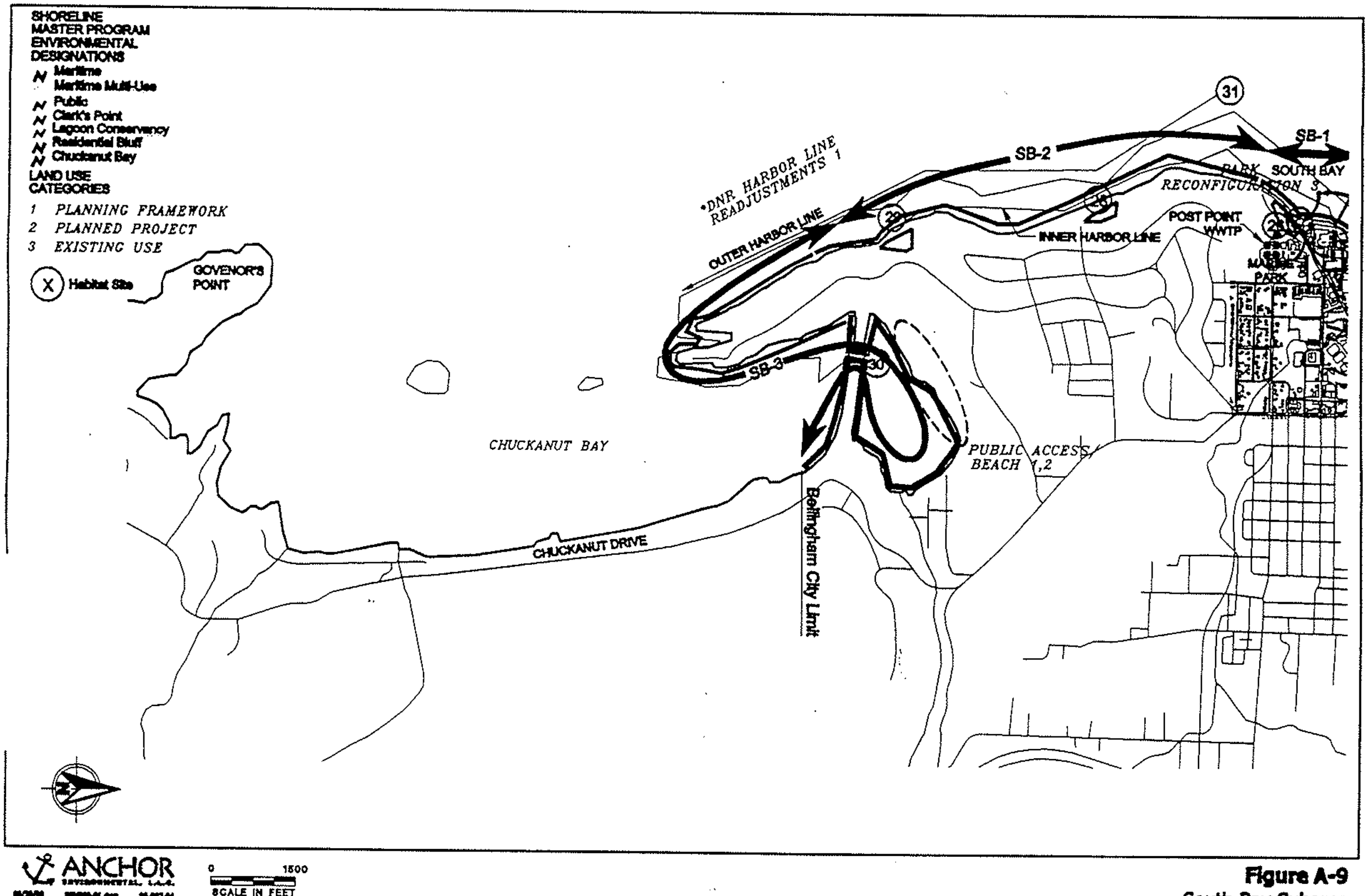



**Figure A-9**
South Bay Subarea

## A.11 MARINE SUBAREA

### Subarea Description

This subarea consists of the deeper subtidal waters of Bellingham Bay, encompassing the bay bottom in those areas below about - 40 feet MLLW. Key characteristics of this subarea (Figure A-10) include:

- G-P outfall
- PSDDA Disposal Site
- Commercial, tribal, and recreational fishing

### Recommended Strategy

Protect and enhance habitat and natural resource production in this area; and minimize adjacent shoreline uses and discharges, both outfalls and ships' ballast water, from degrading water or sediment quality. Ensure discharges under G-P's new NPDES permit are controlled and in compliance with permit requirements.

*Primary Uses*

Natural resource production, habitat protection and enhancement, commercial and tribal fishing, commercial shipping, and recreational boating and fishing.

*Land Use*

Land use activities/opportunities in the subarea that are compatible with the recommended strategy include:

- PSDDA dispersive disposal site location
- G-P outfall
- Provide opportunities for habitat enhancements that provide habitat functions and promote tribal, commercial, and recreational fishing

*Habitat*

Habitat restoration and protection opportunities present in the subarea include but are not limited to:

- Protect and enhance natural resources and habitat function

*Sediment Sites, Cleanup, Disposal, and Source Control*

- Based on the source control and natural recovery modeling performed as part of the Whatcom Waterway RI/FS, surface sediment mercury concentrations at the G-P outfall area are expected to decline to below station cluster criteria within the next several years. G-P's new NDPES permit will likely require sediment sampling to verify these model results (should be implemented as a near-term action).
- Work with USCG to control ships' ballast water discharge from occurring in the bay and establish a linkage with USCG protocol for ship discharge practices in inland waters
- Disposal and cleanup options do not occur within this subarea

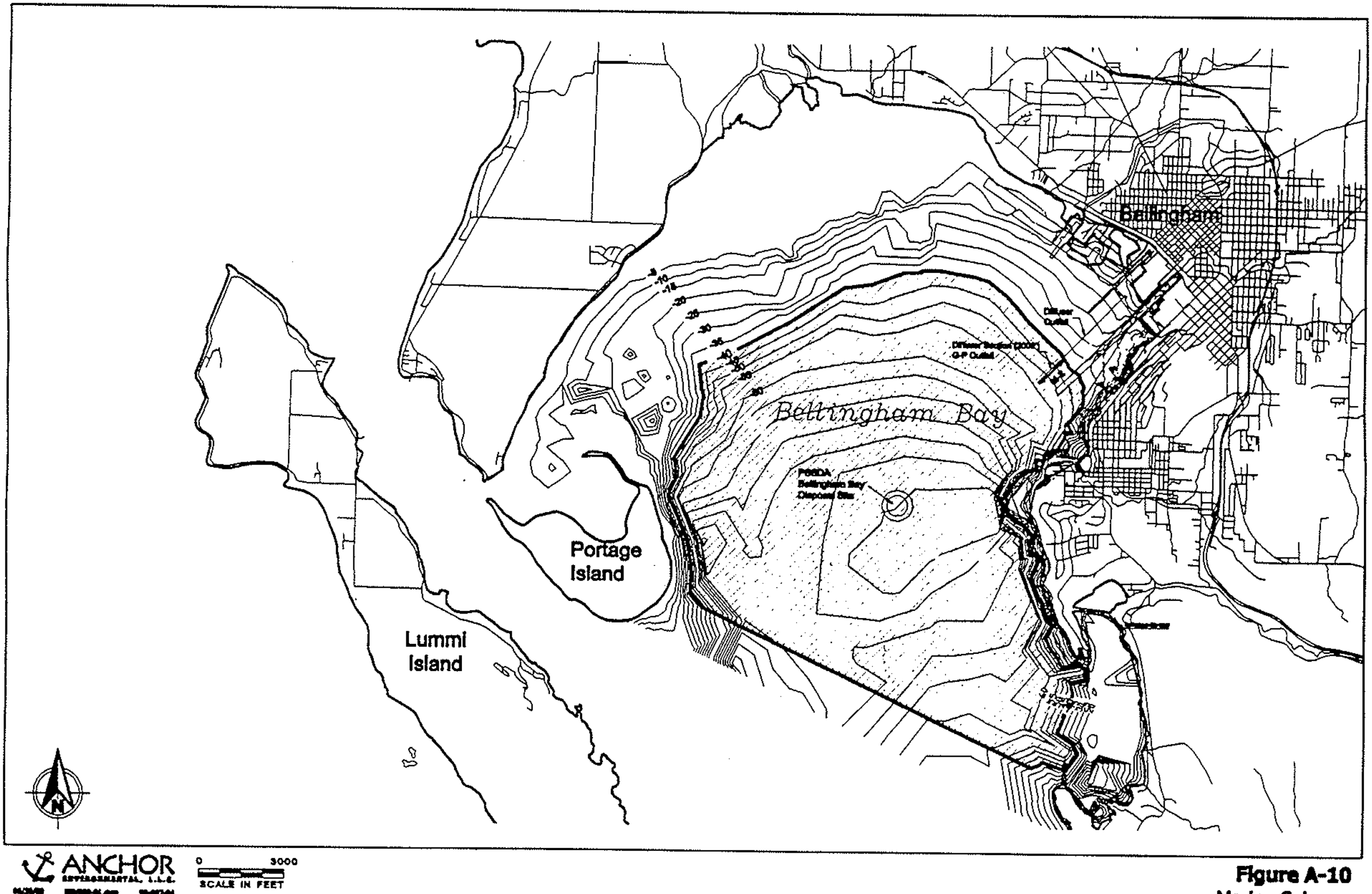



**Figure A-10**
Marine Subarea

# APPENDIX B

## WATERFRONT VISION & FRAMEWORK PLAN
## WATERFRONT FUTURES GROUP FINAL RECOMMENDATIONS

The Waterfront Vision and Framework Plan summarizes the key recommendations of the Waterfront Futures Group visioning process completed during 2003 and 2004 and addressing the changing nature of Bellingham's Waterfront.

# Waterfront Vision & Framework Plan

## CONNECTING BELLINGHAM WITH THE BAY

## WATERFRONT FUTURES GROUP
## FINAL RECOMMENDATIONS

DECEMBER 2004

Waterfront Futures

Project Sponsors
City of Bellingham Port of Bellingham

Harbor Center Building • 1801 Roeder Avenue • Bellingham, WA 98225 • 360-676-6880 • www.waterfrontfutures.org

**Dear Residents of Bellingham and Whatcom County,**

One of Bellingham's greatest assets is its unparalleled waterfront. The Waterfront Futures Group unanimously agrees that the future of Bellingham is inextricably tied to our waterfront and its wise development. Decisions made today will determine the character and livability of the Bellingham Bay shoreline for many decades.

We thirteen citizens came together for nearly two years in public meetings, hearings and community conversations to fashion a 'living document' that will:

- Establish a framework and citizens' vision for the future of the waterfront;
- Provide guiding principles to the City of Bellingham, the Port of Bellingham and other area jurisdictions for managing future water-related development;
- Stimulate public cooperation, public investment and public-private partnerships in planning, acquisition and waterfront area improvements;
- Protect legal mandates and rights and responsibilities of all parties; and
- Recognize the environmental, cultural and economic systems affecting Bellingham Bay, with particular attention to the heritage of Native American tribes.

We encourage you to use the Waterfront Vision and Framework Plan, Connecting Bellingham with the Bay as a guide and help make Bellingham a 21st century waterfront community of which we can all be proud.

**Waterfront Futures Group**

Art Anderson, Chair
Lydia Bennett, Vice-Chair
John Blethen
Jay Bornstein
Craig Cole (2003)
Bob Edie
Darrell Hillaire
Steve Koch
John Macpherson
Lynne Masland
Ted Mischaikov
Ray Tryznka

Planning Commission Liaisons
Chris Morgan
Doug Starcher

# A Call to Action

**The Waterfront Vision & Framework Plan: Connecting Bellingham with the Bay sets forth a compelling vision for the Bellingham Bay waterfront and identifies principles to follow in order to achieve the vision. The Waterfront Futures Group urges the City, the Port and the broader community to use the Waterfront Vision and Framework Plan:**

**As adopted public policy** — The Waterfront Futures Group recommends that the City Council and the Port Commission review, discuss and adopt the Waterfront Vision and Framework Plan by adopting the Guiding Principles as public policy and recognizing the Recommendations as potential means of implementing Guiding Principles. We encourage the City and Port to integrate the Guiding Principles and where appropriate the Recommendations into the Visions for Bellingham and, Bellingham Comprehensive Plan, the Comprehensive Scheme of Harbor Improvements, and other newly developed and updated master plans and neighborhood plans.

**As a living document** — The WFG recommends the Waterfront Vision and Framework Plan as a valuable asset for decision-making over time and in the context of changing conditions, new information and evolving community priorities.

**To stimulate cooperation, public investment and public-private partnerships during master planning, property acquisition and waterfront area improvements** — The Waterfront Futures Group applauds the City and Port for investing in cooperative research, planning and public involvement during the Waterfront Futures Project. We encourage the City and Port to expand on this successful partnership using formal inter-local agreements, a Waterfront Renewal Authority, a Waterfront Advisory Group or other tools capable of ensuring public accountability while avoiding excess bureaucracy.

**As a guide during master plan development, site planning, project implementation and public and private decision-making** — The Waterfront Futures Group encourages all decision-makers to regularly consult the Waterfront Vision and Framework Plan. Its intent is not to usurp decision-makers authority or interfere with legal mandates, rights or responsibilities, but to be used as an element of thoughtful deliberation for decisions at all levels that affect the Bellingham Bay waterfront.

**As part of a broader picture of environmental, cultural and economic systems affecting Bellingham Bay** — The WFG recognizes the interconnectedness of larger environmental, cultural and economic systems. We encourage the City and Port to expand the scope of future waterfront planning in and around Bellingham Bay, working with the Lummi Nation, Whatcom County, the Nooksack Tribe and others.

# Waterfront Vision & Framework Plan

**CONNECTING BELLINGHAM WITH THE BAY**

**WATERFRONT FUTURES GROUP**
**FINAL RECOMMENDATIONS**

Introduction

**Lead a cooperative process that takes a fresh look at our waterfront and recognizes the diverse perspectives of our community.**

**Our mission is to create a compelling vision for current and future generations and identify the steps to get us there.**

— WFG Mission Statement

In January 2003, the City and Port appointed eleven citizens to serve as the Waterfront Futures Group (WFG) and asked them to take a fresh and independent look at the Bellingham Bay waterfront.

The Waterfront Vision and Framework Plan: Connecting Bellingham with the Bay represents the results of that process. To become real, this vision and framework plan relies on regular use and follow-up by decision-makers. A separate document, the Waterfront Action Plan, recommends actions needed in the first three years to successfully launch the plan.

To create the foundation for the Vision and Framework Plan, the Waterfront Futures Group gathered advice, insights and knowledge from property owners and businesses, community groups and interested citizens. The Group gathered input from comments submitted online and at open houses, detailed proposals in the form of white papers and letters, and on-going discussion during waterfront walks, boat tours and public meetings.

Assembling and sorting out what they heard and learned occurred while the Group engaged in a facilitated retreat followed by a series of almost weekly work sessions. Review of draft materials followed discussion and debate culminating in direction for a draft Vision document. The Project published and broadly distributed (including publication in the local daily newspaper) the draft documents just prior to public open houses where members gave a brief presentation, took questions and had time to individually engage citizens in discussion. They repeated this process of work session deliberations followed by publication, release and presentation at public open houses in preparing and publishing the draft Framework Plan and Action Plan.

### How to Use the Waterfront Vision and Framework Plan

During the process of developing a vision of how to better connect Bellingham with Bellingham Bay, the WFG defined a waterfront planning area and six distinct "character areas." They developed a set of Guiding Principles to use as a guide in achieving the Waterfront Vision and Framework Plan and elaborated upon how the Guiding Principles apply within each character area.

The Waterfront Vision and Framework Plan also includes Recommendations specific to each part of the waterfront. The Waterfront Futures Group developed area-specific Recommendations as ways to apply the Guiding Principles and achieve the future waterfront vision for the area. The WFG suggests the Recommendations be recognized as possible means of implementation, but not adopted as public policy. Recommendations are grouped under headings that describe important aspects or unique features of each character area. The Recommendations describe changes or steps needed to realize the vision and framework plan and often respond to more than one Guiding Principle.

The Waterfront Vision and Framework Plan illustrates how the vision for each area may be realized. Drawings, schematic plans and sketches are conceptual and locations for uses and activities are provided as suggestions. Sites are inexact and are provided as ideas for further analysis to determine feasibility and design details during master planning and implementation.

A detailed list of expert and public input, reports and research results is provided at the end of this document. Several key resource documents deserve special mention:

Waterfront Futures Group Initial Findings Report;

Final Environmental Workshop Report: Opportunities and Ideas for Habitat Restoration and Water Access on Urban Bellingham Bay;

Design Assistance Team Report: Bellingham's Waterfront: Where Past, Present and Future Come Together;

Waterfront Center Report to the Citizens of Bellingham.

## FOUNDATION FOR DECISIONS

A dozen ideas emerged repeatedly during the WFG work sessions and served as a foundation for subsequent decisions. They provide a set of underlying assumptions for a successful waterfront in our community:

**1.** Successful waterfronts are welcoming to all.

**2.** Bellingham Bay and its physical landscape are part of larger natural systems.

**3.** Jobs of the future will help shape waterfront redevelopment.

**4.** Sustainability is a cornerstone for all waterfront work.

**5.** Education, training and apprenticeships increase our human capital and workforce capacity.

**6.** Fishing and food from the sea, deep-water access, and shallow draft marine access will continue to be a significant part of our area's heritage, economy, and culture.

**7.** Waterfront redevelopment consistent with community goals will require significant public investment and in some cases public ownership as a catalyst for private reinvestment.

**8.** The "best" of our waterfront must be reserved for the benefit of our entire community.

**9.** Our waterfront assets are many and diverse, allowing us balanced development over time with a wide variety of purposes.

**10.** Successful waterfronts create continuous public access along the entire shoreline.

**10.** As part of Bellingham's evolving economy, we will need to make provisions for industries moving off the waterfront.

**12.** Innovative approaches to cleanup of upland and in-water contamination will be needed to restore the health of our waterfront.

# WATERFRONT CHARACTER AREAS

long panoramas of delta and sand from the stack on the bluff to the dock on the shore. a long natural beach.

## Little Squalicum

This area presents an outstanding opportunity for habitat and beach restoration. Future facilities on the bluff could be models of sustainable development and uses.

a harbor for boats, a harbor to the bay. fishermen, mills and white tablecloth dining, our port to the bay.

## Squalicum

Future development could include a vibrant mixture of diverse facilities—housing, retail, office and public spaces throughout the area.

full of people, full of life!
down to the water,
up to the town!
living, working, gathering here!

## City Center

This area could become an exciting mixture of housing, cultural facilities, waterfront access, public gathering places and waterfront activities.

The Cornwall Avenue landfill could include housing, open space, habitat restoration areas, public facilities and an overwater pathway connecting it to Boulevard Park and Fairhaven via the Taylor Avenue Dock.

long strands of park. stretching, connecting, people in the sun, people in the rain from village to town.

## South Hill & Boulevard Park

Boardwalks and improved beach access could become expansions of existing open space and trails, opening up additional recreational opportunities from Boulevard Park to Padden Creek.

the original village. bricks, books, the village green. kayaks, trains, ferries passing. connecting islands up to the town!

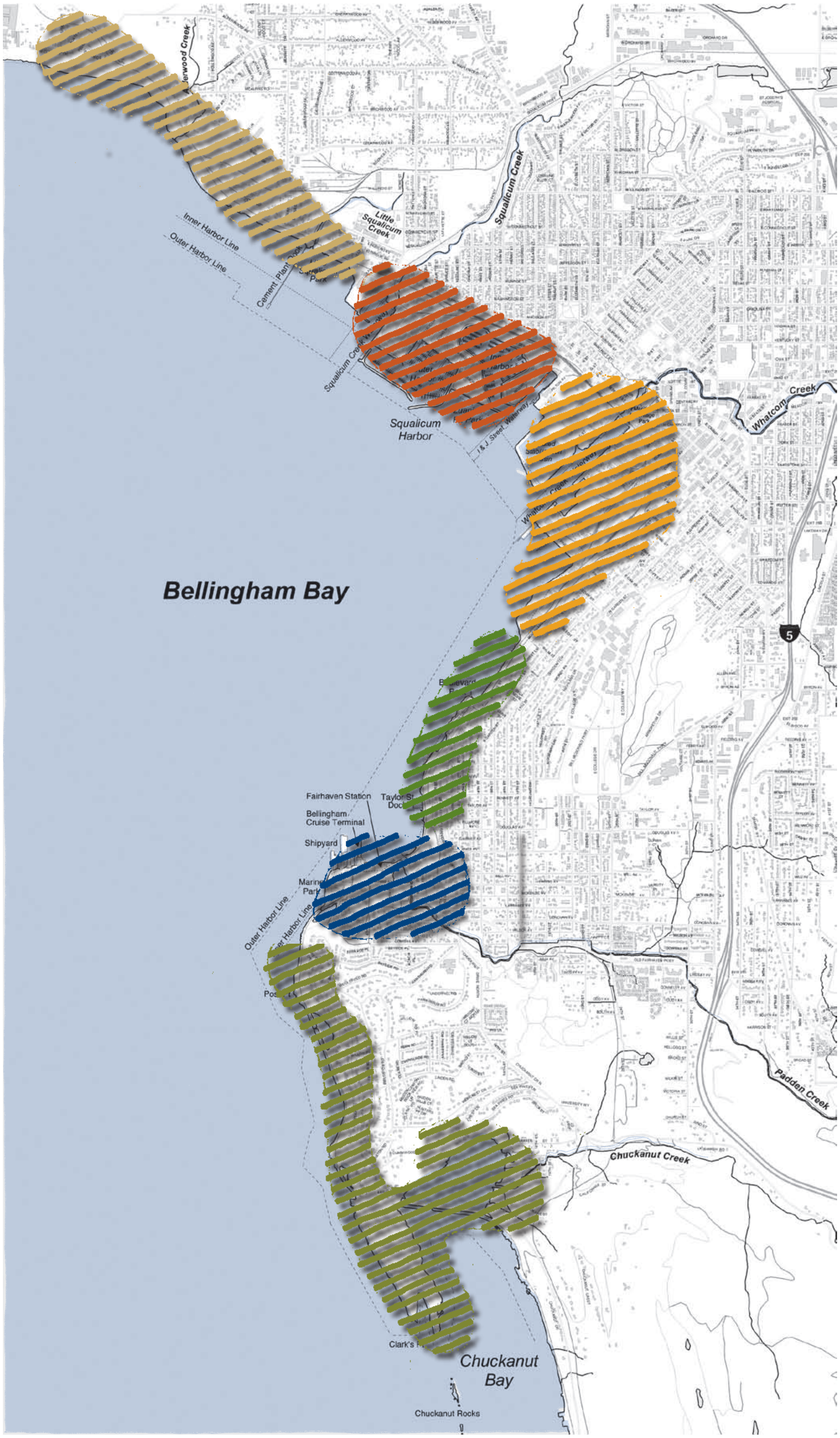
## Fairhaven

A direct connection from the Village Green to the shore would allow access to the water through and around the marine industrial area.

still wild still green.
here we bow down to the water.
a train whistle blows.

## Chuckanut & Edgemoor

Creating new kayak landings along the shore and a shoreline trail from Fairhaven and the Coast Millennium Trail could provide additional access for boaters.




The planning area includes the Bellingham Bay waterfront between the Bellingham Urban Growth Area (just north of Cliffside Drive) on the north and Chuckanut Bay on the south. Moving from north to south, there are six areas of distinct character within the overall waterfront area:

**Little Squalicum**
**Squalicum**
**City Center**
**South Hill & Boulevard Park**
**Fairhaven**
**Chuckanut & Edgemoor**

# GUIDING PRINCIPLES AND RECOMMENDATIONS

The Waterfront Vision and Framework Plan provides four overarching principles and thirty-five detailed principles to guide progress toward achieving a successful waterfront. The Waterfront Futures Group recommends all thirty-nine Guiding Principles for adoption as public policy. In some cases, bulleted statements follow the Guiding Principle. These statements provide further detail and should be treated as part of the Guiding Principle for that area.

### Reinforce the Inherent Qualities of Each Place on the Waterfront

1. Make the waterfront a regular part of the lives of more people.
2. Respect history, cultures and the arts.
3. Make the waterfront inviting to people on foot.
4. Reinforce a unique "sense of place" at different waterfront locations.
5. Complement adjacent uses.

### Restore the Health of Land & Water

1. Enhance or reintroduce natural systems.
2. Create and restore habitat wherever possible.
3. Remediate upland and in-water contamination.
4. Protect existing natural shorelines.
5. Seek opportunities to soften existing hardened shorelines.
6. Tailor environmental cleanup strategies and remediation to planned use.
7. Manage stormwater to enhance estuarine habitats.
8. Require sustainable practices in all development.
9. Restore, enhance and expand beaches wherever possible.
10. Connect proposed open space and natural areas to regional open space network and wildlife corridors.
11. Explore mitigation banking and incentives (such as environmental credits) for environmental resource protection and enhancement prior to redevelopment.

### Improve Waterfront Access

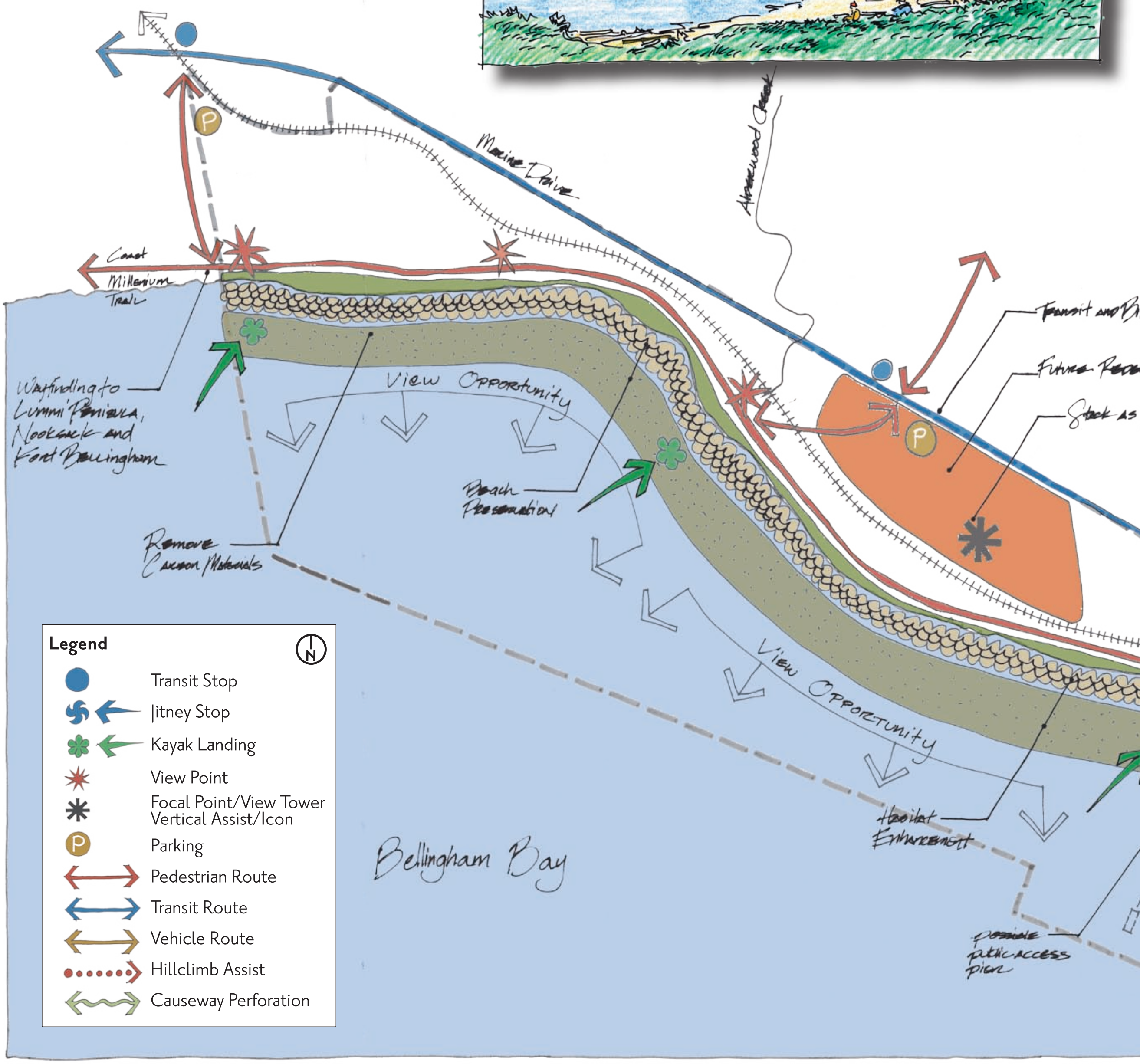
1. Develop strong connections between uplands and water.
2. Provide links to regional trail systems.
3. Provide multiple modes of access to each area of the waterfront.
4. Provide convenient connections between different modes of transportation.
5. Create and connect large and small parks and open spaces with a "braided" system of pedestrian trails.
6. Enhance opportunities for visual access to waterfront areas.
7. Provide the opportunity to walk the waterfront while respecting natural habitat.
8. Help people find their way.
9. Provide way finding for the Coast Millennium Trail as a route that follows existing and proposed trails.
10. Explore the concept of public access "banking" and other financing incentives for improving public access.
11. Protect and enhance environmental resources when designing for shoreline access and upland development.

### Promote a Healthy & Dynamic Waterfront Economy

1. Create new mixed-use areas on the waterfront for commercial, industrial, educational, recreational and residential uses.
2. Support water-dependent activities and uses.
3. Create conditions attractive to jobs of the future.
4. Strengthen the tie between local jobs and resources.
5. Provide public amenities and infrastructure to support redevelopment.
6. Improve permitting processes to achieve the goals and principles of the Waterfront Vision.
7. Explore economic spin-off related to Bellingham Bay Pilot cleanup strategies.
8. Provide incentives and credits for "green" buildings.

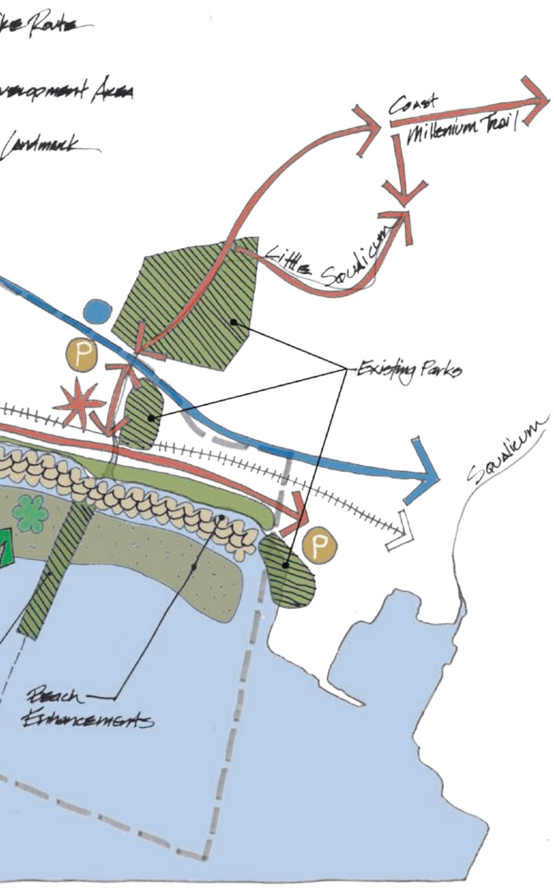
## SCHEMATIC MAP

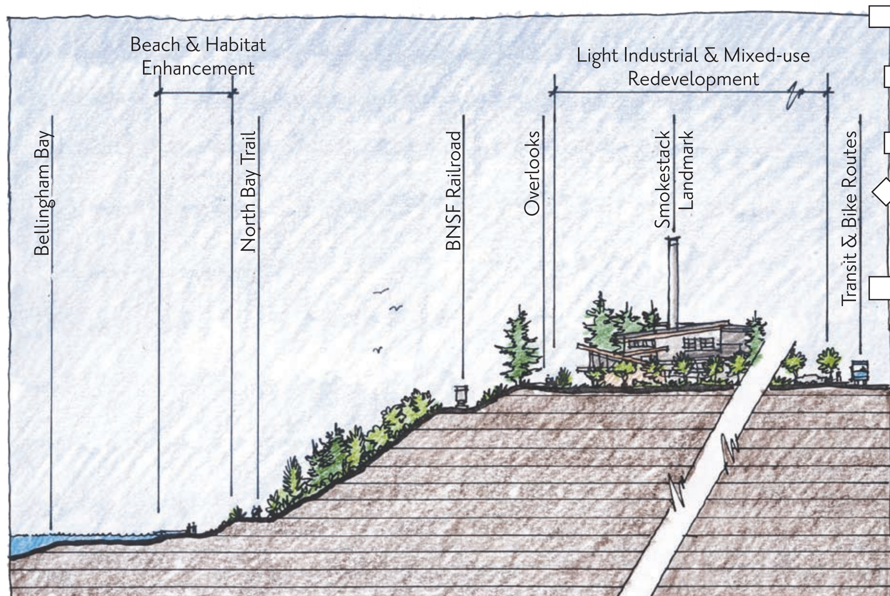
**Schematic map representing public access, transportation, parks and open space**


Marine Drive
Coast Millenium Trail
Wayfinding to Lummi Peninsula, Nooksack and Fort Bellingham
View Opportunity
Beach Preservation
Remove Caisson Materials
View Opportunity
Habitat Enhancement
Bellingham Bay
Possible public access pier
Legend
N
Transit Stop
Jitney Stop
Kayak Landing
View Point
Focal Point/View Tower
Vertical Assist/Icon
Parking
Pedestrian Route
Transit Route
Vehicle Route
Hillclimb Assist
Causeway Perforation

# Little Squalicum

**THE VISION FOR LITTLE SQUALICUM** restores the natural beach and habitat, and preserves the largely deciduous tree-covered bluff and its connection to the landscape of the Nooksack River delta. Public access along the beach will be limited in favor of habitat restoration. Access to the beach will be improved with trails that traverse the slope, connecting the beach with the bluff trail and connecting pedestrians to transit stops and parking along Marine Drive. The existing cement plant will be accommodated as long as it continues to operate, but new heavy industrial uses will be precluded. When the cement plant ceases operation, the 50-acre site should be master planned for a mixture of uses, including light industrial, research and institutional uses. Existing landmark industrial buildings should be adaptively reused where possible, and the existing landmark smoke stack should be preserved. The emphasis should be on habitat restoration and enhancement rather than human use along the beach and bluff in Little Squalicum. Future development should be limited to the top of the bluff and be compatible in scale and density with surrounding residential development in the area.




**Section looking west showing beach & habitat enhancement, site redevelopment, parking, transit stop, overlook & railroad crossing. (Concrete plant smokestack in the background.)**

# GUIDING PRINCIPLES

## Reinforce the Inherent Qualities of Each Place on the Waterfront

1. Make the waterfront a regular part of the lives of more people.
2. Respect history, cultures and the arts.
   - Identify historic sites prior to development
   - Embrace and expand knowledge of past heritage
   - Identify, locate and provide interpretative information for native history, pioneer history and natural history
3. Make the waterfront inviting to people on foot.
4. Reinforce a unique "sense of place" at different waterfront locations.
   - Protect the natural shoreline and bluff
   - Accommodate light industrial and encourage research and institutional uses
   - Preserve landmark industrial structures
   - Preserve and enhance existing vegetation where possible
   - Preserve the native trees on the bluff and maintain the soft, largely deciduous vegetated profile
   - Guide redevelopment of industrial areas to respect the character of Little Squalicum
   - Continue to recognize the influence of Nooksack River and river delta on character of Little Squalicum
5. Complement adjacent uses.
   - Preserve and protect the habitat function of the adjacent beach and bluff

## Restore the Health of Land & Water

1. Enhance or reintroduce natural systems.
   - Preserve and enhance the natural beach and restore onshore and offshore habitat
   - Incorporate coastal geology and other natural forces in inter-tidal habitat and beach enhancement
2. Create and restore habitat wherever possible.
   - Give priority to habitat restoration and preservation both on the beach and in the tidelands
   - Limit access in favor of habitat protection
3. Remediate upland and in-water contamination.
4. Protect existing natural shorelines.
   - Recognize the dynamic nature of changing tidelands from Nooksack River sediments
5. Seek opportunities to soften existing hardened shorelines.
6. Tailor environmental cleanup strategies and remediation to planned use.
7. Manage stormwater to enhance estuarine habitats.
   - Treat, or otherwise assure the quality of, stormwater used to enhance estuarine habitats
8. Require sustainable practices in all development.
   - Favor plans which exploit adaptive reuse of existing cement plant structures
   - Remediate existing contamination while establishing erosion control
   - Address creosoted pier pilings
9. Restore, enhance and expand beaches wherever possible.
10. Connect proposed open space and natural areas to regional open space network and wildlife corridors.
    - Tie the Squalicum natural system to the Nooksack River riparian corridors and upland conservancy areas
11. Explore mitigation banking and incentives (such as environmental credits) for environmental resource protection and enhancement prior to redevelopment.

## Improve Waterfront Access

1. Develop strong connections between uplands and water.
   - Improve vehicular access and circulation, and provide shared decentralized parking away from the shoreline
2. Provide links to regional trail systems.
3. Provide multiple modes of access to each area of the waterfront.
   - Accommodate hand-carry boats on the beach at trail connections
   - Create trails to link transit stops and parking areas with viewpoints, the bluff trail, the beach and hand-carry boat landings
4. Provide convenient connections between different modes of transportation.
5. Create and connect large and small parks and open spaces with a "braided" system of pedestrian trails.
   - Provide large and small open spaces along the waterfront to serve as connecting nodes for trails and "shoreways
6. Enhance opportunities for visual access to waterfront areas.
7. Provide the opportunity to walk the waterfront while respecting natural habitat.
8. Help people find their way.
9. Provide way finding for the Coast Millennium Trail as a route that follows existing and proposed trails.
10. Explore the concept of public access "banking" and other financing incentives for improving public access.
11. Protect and enhance shoreline environment when designing for shoreline access and upland development.

### Promote a Healthy & Dynamic Waterfront Economy

1. Create new mixed-use areas on the waterfront for commercial, industrial, educational, recreational and residential uses.
   - Support existing, viable, non-polluting industrial uses
   - Assist with long term transition strategy for heavy industrial uses
   - Link technical institutions with training for new forms of employment
   - Extend and expand upon existing industry and commerce
   - Integrate commerce and new industry with training and education facilities
2. Support water-dependent activities and uses.
   - Provide transition and relocation of non water-dependent heavy industrial and commercial waterfront uses
3. Create conditions attractive to jobs of the future.
4. Strengthen the tie between local jobs and resources.
5. Provide public amenities and infrastructure to support redevelopment.
6. Improve permitting processes to achieve the goals and principles of the Waterfront Vision.
   - Anticipate redevelopment of upland industrial property by providing appropriate infrastructure, design guidelines, zoning and permitting processes
7. Explore economic spin-off related to Bellingham Bay Pilot cleanup strategies.
8. Provide incentives and credits for "green" buildings.

## RECOMMENDATIONS

### Culture & History

- Collaborate with Native American neighbors.
- Provide interpretative information about the Lummi Nation, Nooksack River and Old Fort Bellingham.
- Preserve the natural beach and maintain it as public open space and restored habitat.

### Restoration & Natural Habitat

- Remove wood-chip debris along the beach.
- Replace or remediate creosoted pilings at cement plant dock.
- Monitor Little Squalicum Creek and uplands and remediate as appropriate.

### Cement Plant Area

- Research existing condition and potential future public uses of cement plant dock.
- Accommodate the existing cement plant until it closes, and preclude new heavy industrial uses.
- When the cement plant ceases operation, prepare a master plan for the site that accommodates a mixture of uses compatible with surrounding low density residential development.
- Consider preservation of landmark industrial structures, such as the smoke stack, as redevelopment occurs.

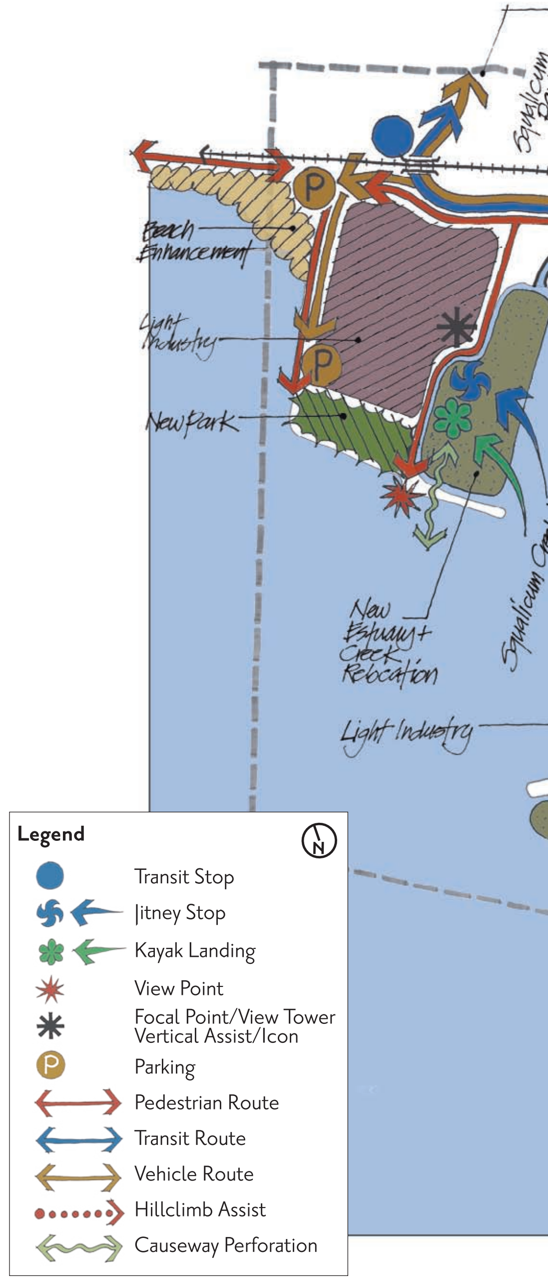
### Connections & Transportation

- Link green spaces to other green corridors along the river, on the Lummi Reservation and wetlands adjacent to the airport.
- Link the Coast Millennium Trail and the North Bay Trail.
- Create a trail along the bluff with views out to the water.
- Develop trail connections between the beach and uplands using existing grade separation opportunities for crossing beneath the railroad.
- Design way-finding system into and out of Little Squalicum.
- Evaluate approaches for parking options close to Little Squalicum Beach Park.
- Create small parking areas along Marine Drive at trailheads.
- Designate bicycle routes along Roeder Avenue and Marine Drive.
- Locate transit stops at trail heads on Marine Drive.

### Future Development & Open Space

- Establish clear and definitive design and development guidelines for new development on the bluff.
- Encourage adaptive reuse of existing buildings.
- Preserve existing and create new public viewpoints along the bluff trail and at trailheads.
- Cluster mixture of uses on the bluff buffered from adjacent residential areas.
- Cluster new development on the uplands with green buffers.

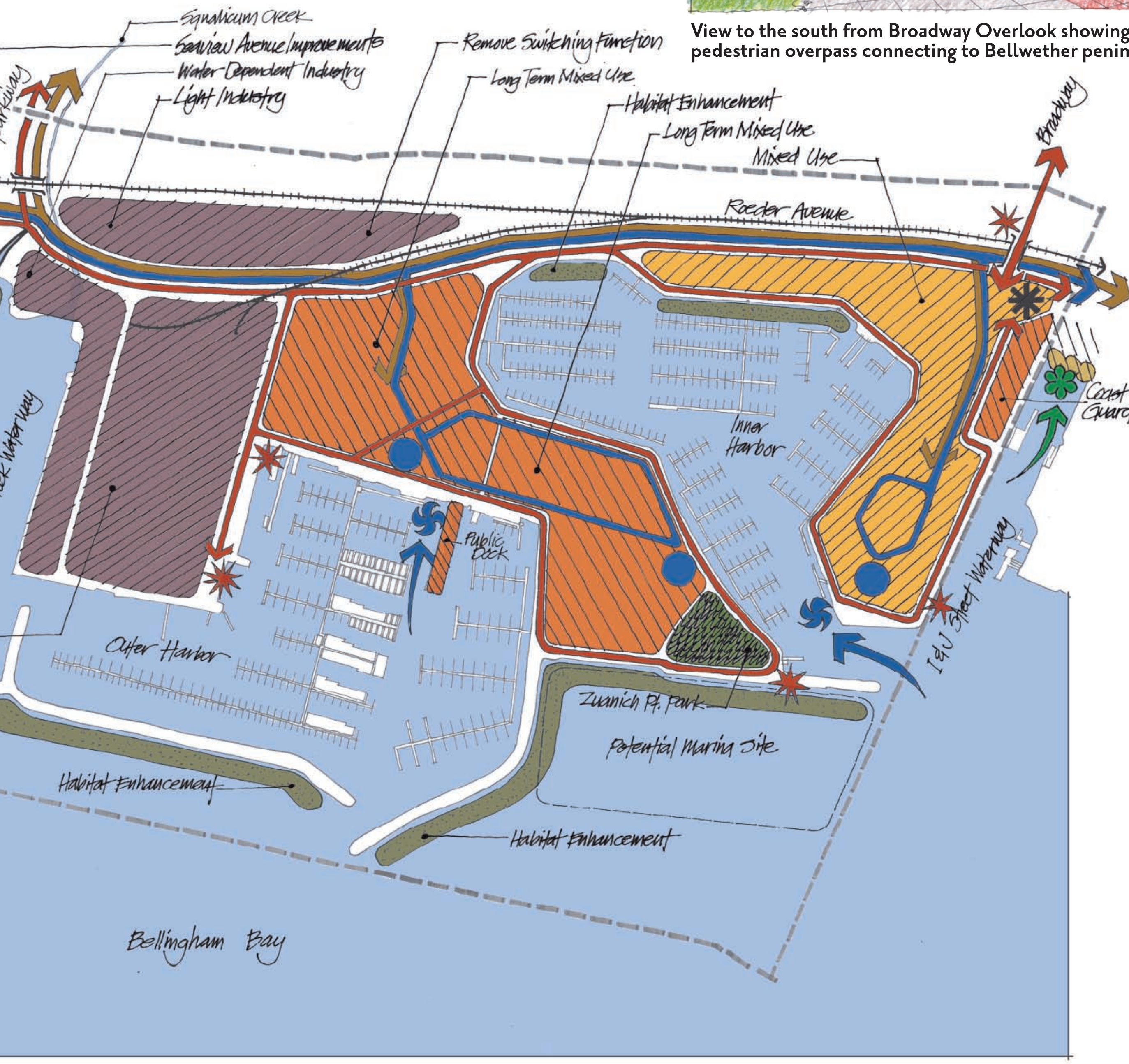
**SQUALICUM IS A PLACE** that supports industry, working boats and pleasure craft, along with places to walk, sit and enjoy water views. The vision for Squalicum builds upon and reinforces this character. Water-related industrial uses will continue around the Squalicum Waterway, and marina-related activities will continue to be predominate around the inner and outer harbor. Over time, maritime uses will be diversified and the existing parking and marina support-area will gradually transition to a mixture of light industrial, commercial and residential uses. The Bellwether Peninsu-



# Squalicum

la will be further developed with retail and visitor support services along with some housing. Marine habitat will be recreated at the mouth of Squalicum Creek, and along existing marina breakwaters. Public access to the water and around Squalicum will be enhanced with improved trails, new viewpoints and improved transit. Squalicum will be a diverse center of maritime activity, and a place that welcomes residents, workers and visitors alike.

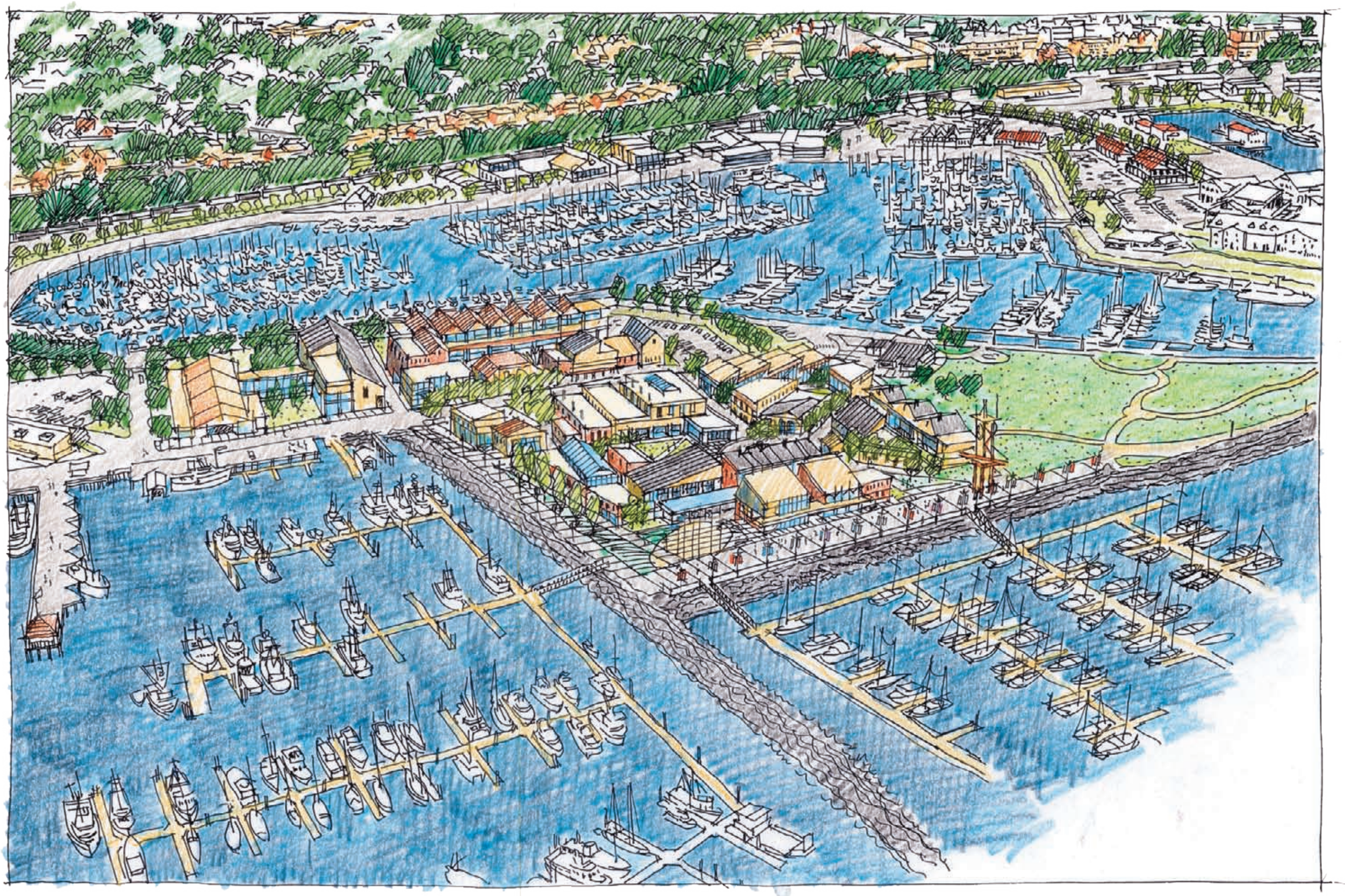
**View to the south from Broadway Overlook showing new pedestrian overpass connecting to Bellwether peninsula.**



# GUIDING PRINCIPLES

## Reinforce the Inherent Qualities of Each Place on the Waterfront

1. Make the waterfront a regular part of the lives of more people.
   - Welcome visitors (coming by water or land)
2. Respect history, cultures and the arts.
   - Devise a process of engagement with Native history
   - Embrace, include and expand upon knowledge of cultural and historical past
3. Make the waterfront inviting to people on foot.
   - Establish clear and definitive design and development guidelines
4. Reinforce a unique "sense of place" at different waterfront locations.
   - Support transition and re-use of centralized surface parking areas
   - Nurture diversity of water-oriented activities by including a mixture of light industrial, commercial and residential uses
   - Establish view preservation guidelines
5. Complement adjacent uses.



**Aerial view looking east showing mixed-use development, existing marina and potential new marina (lower right).**

### Restore the Health of Land & Water

1. Enhance or reintroduce natural systems.
2. Create and restore habitat wherever possible.
3. Remediate upland and in-water contamination.
4. Protect existing natural shorelines.
5. Seek opportunities to soften existing hardened shorelines.
6. Tailor environmental cleanup strategies and remediation to planned use.
7. Manage stormwater to enhance estuarine habitats.
   - Treated or otherwise, assure the quality of stormwater used to enhance estuarine habitats
8. Require sustainable practices in all development.
   - Establish and enforce a groundwater and contamination collection and treatment plan to prevent contaminates from entering the bay
   - Use building materials which do not produce toxics, i.e. avoid copper roofs
   - Reduce "heat island" effect by selecting light colored paving materials and/or use open grid surface systems
9. Restore, enhance and expand beaches wherever possible.
10. Connect proposed open space and natural areas to regional open space network and wildlife corridors.
11. Explore mitigation banking and incentives (such as environmental credits) for environmental resource protection and enhancement prior to redevelopment.

### Improve Waterfront Access

1. Develop strong connections between uplands and water.
2. Provide links to regional trail systems.
   - As redevelopment occurs, maintain waterside trails
3. Provide multiple modes of access to each area of the waterfront.
   - Provide large and small open spaces along the waterfront to serve as connecting nodes for trails and "shoreways"
   - Locate dry stack storage and boat trailer parking away from the water
4. Provide convenient connections between different modes of transportation (jitney/bus).
5. Create and connect large and small parks and open spaces with a "braided" system of pedestrian trails.
6. Enhance opportunities for visual access to waterfront areas and activities.
7. Provide the opportunity to walk the waterfront while respecting natural habitat.
   - Provide viewing that respects industrial activity areas
8. Help people find their way.
9. Provide way finding for the Coast Millennium Trail as a route that follows existing and proposed trails.
10. Explore the concept of public access "banking" and other financing incentives for improving public access.
11. Protect and enhance shoreline environmental resources when designing for shoreline access and upland development.

### Promote a Healthy & Dynamic Waterfront Economy

1. Create new mixed-use areas on the waterfront for commercial, industrial, educational, recreational and residential uses.
2. Support water-dependent activities and uses.
3. Create conditions attractive to jobs of the future.
4. Strengthen the tie between local jobs and resources.
5. Provide public amenities and infrastructure to support redevelopment.
6. Improve permitting processes to achieve the goals and principles of the Waterfront Vision.
7. Explore economic spin-off related to Bellingham Bay Pilot cleanup strategies.
8. Provide incentives and credits for "green" buildings.

# RECOMMENDATIONS

## Future Development

- Cluster industrial activity around the south side and east end of Squalicum Creek Waterway.
- Reinforce the use of Squalicum Parkway as a means of pedestrian, vehicular and rail access to the waterfront.
- At the south end of the Mount Baker Plywood site, create an area for light industry including opportunity for start-up businesses.
- Support transition of some surface parking areas to a denser mix of maritime-related and marina support functions including structured or decentralized parking, commercial uses and potentially housing.
- Add new employment and living opportunities to existing maritime support areas as part of new mixed-use development.
- Create a focal point for charters, excursion craft, etc.
- Maintain a fishing and commercial charter boat center near a public dock in the outer harbor.
- Develop an area to buy seafood from providers.
- Investigate providing a small vessel boatlift to support inland dry stack storage and to replace existing launch ramp at the inner harbor.
- Create denser, mixed-use development along Roeder Avenue and along the east end of the site and on Bellwether Peninsula.
- Establish and locate in the Squalicum area an activity hub that might include eco-tourism, recreation, bike facilities, a hostel, and an interpretive center as part of extending a welcome to visitors.
- Establish design guidelines that provide for varied heights of structures, preserve important public views, create opportunities for new public views, and consider existing character as a metaphor for new development.
- Encourage mixed-use development with design guidelines that are consistent with the character of Squalicum.
- Cluster related products and uses.

## Connections & Trails

- Extend pathway westward along Roeder Avenue to the Squalicum Creek Waterway and Little Squalicum Park.
- Extend pathway around Mount Baker Plywood to provide access to open space at the south end of the peninsula.
- Extend pathway along east side of Mount Baker Plywood to a new overlook adjacent to the Squalicum estuary.
- Re-examine the role of the Broadway corridor as a boulevard and support redesign that is more pedestrian friendly, retaining street trees and setback sidewalk.
- Construct a pedestrian bridge over Roeder Avenue and the railroad to connect the neighborhood on the bluff with the waterfront along the Broadway Street alignment and connect the bridge to a vertical building with opportunities for views of the water.
- Provide water jitney stops at the south side of Mount Baker Plywood peninsula, the public dock in the outer harbor and at the end of the Bellwether Peninsula.
- Create transit routes for on demand service to the Bellwether Peninsula and along Coho Way.
- Provide a hand-carry boat landing on the west side of Squalicum Creek Waterway.
- Focus large truck access on Squalicum Parkway and improve access to I-5 at Guide Meridian.
- Improve Seaview Avenue as a vehicular and pedestrian route from Eldridge Avenue to the waterfront.
- Retain and enhance the existing shore side path system throughout Squalicum Marina area.

**View from water toward Mt. Baker Plywood showing new incubabutor businesses, public park, creek realignment and habitat restoration.**

## Open Space

- Create a new open space at the south end of the Mount Baker Plywood peninsula adjacent to new estuary and hand-carry boat landing on Squalicum Creek Waterway.
- Reexamine marina parking requirements with the intent to reduce.
- Relocate parking away from the water's edge.
- Pursue relocation of rail switching yards to provide space for long term or centralized parking away from the water's edge.
- Provide public overlooks of the water along pathways at the Mount Baker Plywood peninsula, Bellingham Cold Storage peninsula, Zuanich Park and the Tom Glenn Commons on the Bellwether Peninsula.
- Encourage concealed parking in new developments where feasible, in preference to surface parking.
- Designate the area adjacent to the east side of Bellingham Cold Storage as a pathway to a viewpoint overlooking the outer harbor and to another viewpoint adjacent to the boat haul-out area.

## Restoration & Natural Habitat

- Relocate Squalicum Creek mouth to create a new estuary west of and separate from the Squalicum Creek Waterway.
- Remove old in-water structures and restore shoreline and creek delta.
- Create sub-tidal salmon migration habitat with benches along the west side of I & J Waterway.

## Culture & History

- Collaborate with Native American neighbors.

**View from public dock showing maritime and mixed-use development.**

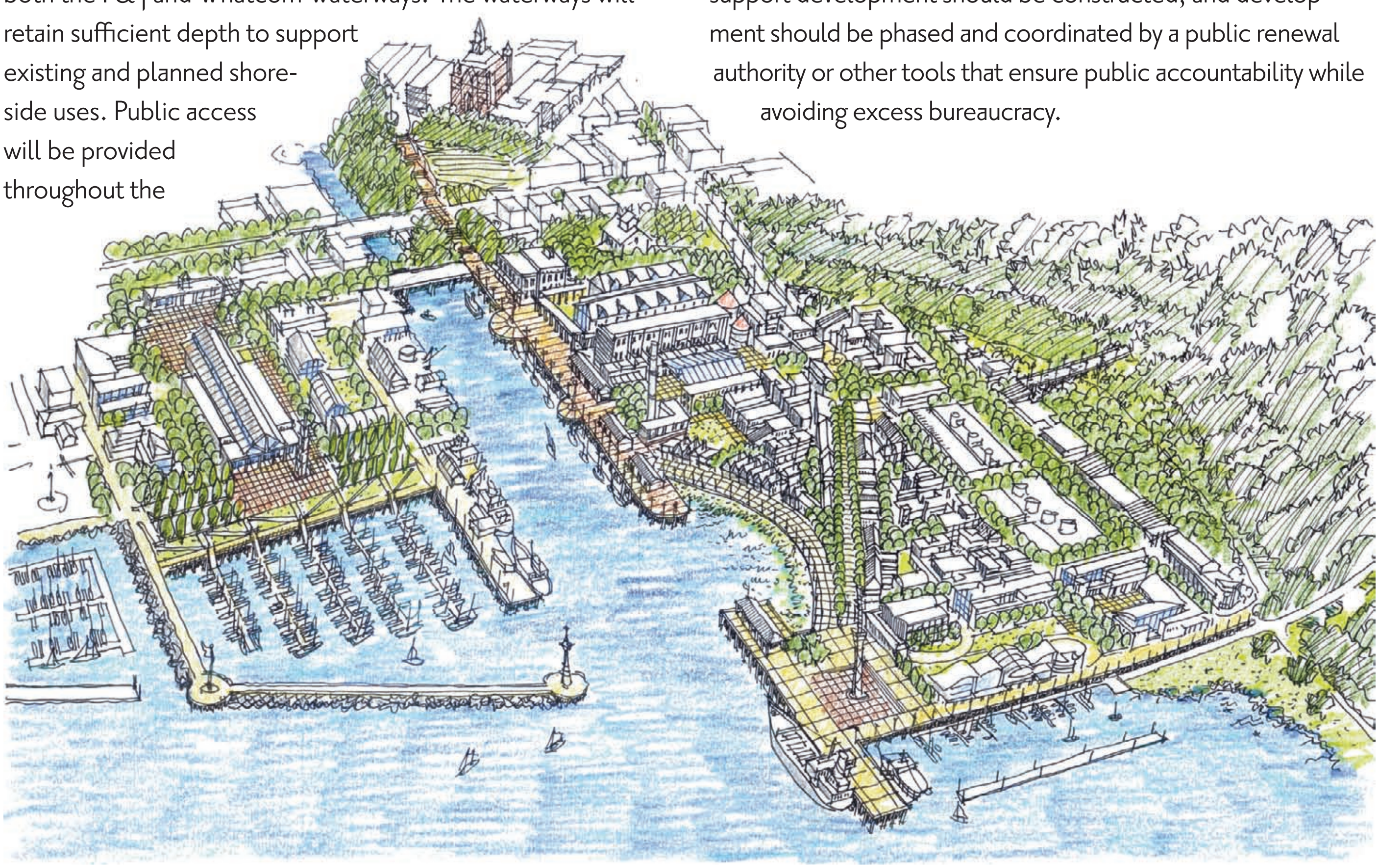
**THE VISION FOR THE CITY CENTER** waterfront calls for the creation of a mixed-use neighborhood that combines commercial, institutional, educational, retail services and residential uses, and that over time will provide many new job opportunities and a substantial amount of urban housing. It will be a neighborhood that complements the existing central business district. The neighborhood will provide a place where people can live, work, study and spend their leisure time without relying on vehicular transportation and while offering a healthy and sustainable relationship between the city and the bay.

The existing aeration stabilization basin (ASB) will be cleaned and opened up to accommodate either a new marina or new marine habitat combined with stormwater treatment or some combination of those uses. When the adjacent tissue warehouse closes, the building will be adapted to accommodate a combination of public uses with links to Old Town.

Deep water moorage will be maintained in the Whatcom Waterway and marine-related commerce will continue on both the I & J and Whatcom Waterways. The waterways will retain sufficient depth to support existing and planned shoreside uses. Public access will be provided throughout the area, with a network of walkways connecting new public spaces and regional trails. Transient moorage will be provided on both sides of the Whatcom Creek Waterway while avoiding critical habitat areas. Habitat enhancement will be a condition of this new transient moorage provision. New transit routes will serve the area and public docks will accommodate multiple modes of water transportation.

New facilities for Western Washington University and other educational institutions will be located in the Center City area with new transportation linkages to the main WWU campus. The Cornwall Avenue landfill site will be improved including open space and pedestrian spaces along the waters edge connected by an over-water trail to Boulevard Park. Mixed-use development on the adjacent uplands could include a terraquarium and a Native American facility.

To realize this vision, the Georgia Pacific property should be acquired and held in public ownership as it is planned and developed over time. Infrastructure and public amenities to support development should be constructed, and development should be phased and coordinated by a public renewal authority or other tools that ensure public accountability while avoiding excess bureaucracy.



**Bird's-eye view showing a mixed-use neighborhood combining commercial, institutional, educational, retail services and residential uses.**

Community Activities/Parking
Beach Enhancement
Light Industrial
Water Dependent Industrial
Beach Enhancement
Bellingham Bay
I & J Street Water Way
Preferred Marina Site
Potential for Natural Stormwater Treatment
Transient Moorage
Habitat Enhancement
Staging/Public Gathering
Deep Draft Moorage
Transient Moorage
Beach Enhancement
New Park
Habitat Enhancement
Boulevard
Terraquarium
Mixed Use
W. Holly
Roeder
Old Town
"D" Street
"C" Street
"F" Street
Maritime Heritage Park
Whatcom Creek
CBD
Whatcom Creek Waterway
Commercial
Cornwall
Railroad
Farmers Market
Chestnut (Two-way)
New Park
Laurel
Existing Open Space
Mixed Use
New Park
Relocated Main Line of Rail Road
Institutional Mixed Use
Pine
W.W.U.
Arboretum
Legend
Transit Stop
Jitney Stop
Kayak Landing
View Point
Focal Point/View Tower Vertical Assist/Icon
Parking
Pedestrian Route
Transit Route
Vehicle Route
Hillclimb Assist
Causeway Perforation


# City Center

# GUIDING PRINCIPLES

## Reinforce the Inherent Qualities of Each Place on the Waterfront

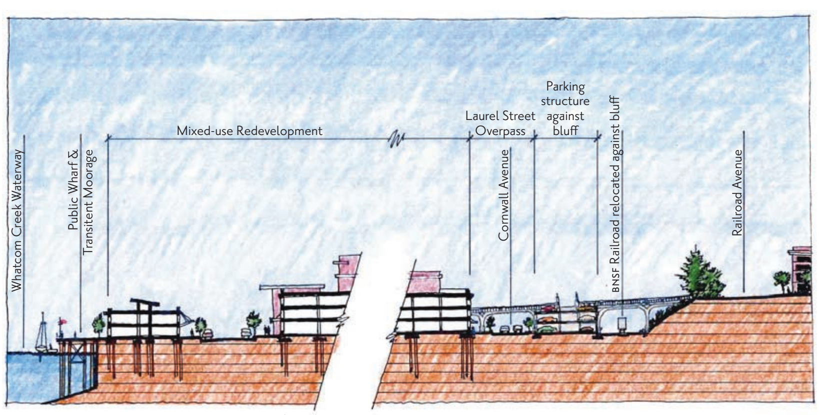
1. Make the waterfront a regular part of the lives of more people.
   - Foster a greater sense of ownership and stewardship for the health of the Bay and its shore lands by providing places for people to live, work, learn and play as a regular part of their daily activities
   - Create physical and cultural conditions that are welcoming to visitors and encourage their participation in waterfront places and activities
2. Respect history, cultures and the arts.
   - Embrace, include and expand knowledge of our peoples and their cultural heritage
3. Make the waterfront inviting to people on foot.
4. Reinforce a unique "sense of place" at different waterfront locations.
   - Support development of a vibrant area that integrates water-dependent uses with new commercial, institutional, educational, and residential uses and public spaces
5. Complement adjacent uses.
   - Create an urban mixed-use neighborhood that will complement downtown

## Restore the Health of Land & Water

1. Enhance or reintroduce natural systems.
2. Create and restore habitat wherever possible.
3. Remediate upland and in-water contamination.
4. Protect existing natural shorelines.
5. Seek opportunities to soften existing hardened shorelines.
6. Tailor environmental cleanup strategies and remediation to planned use.
7. Manage stormwater to enhance estuarine habitats.
   - Treated or otherwise, assure the quality of stormwater used to enhance estuarine habitats.
8. Require sustainable practices in all development.
   - Avoid "heat island" effect by utilizing high reflective roofing materials and vegetated roof systems
   - Make use of on-site renewable energy such as solar and daylighting, to satisfy the building's energy needs
   - Incorporate Leadership in Energy & Environmental Design (LEED) intentions and requirements in design and construction of new structures
9. Restore, enhance and expand beaches wherever possible.
10. Connect proposed open space and natural areas to regional open space network and natural wildlife corridors.
11. Explore mitigation banking and incentives (such as environmental credits) for environmental resource protection and enhancement prior to redevelopment.

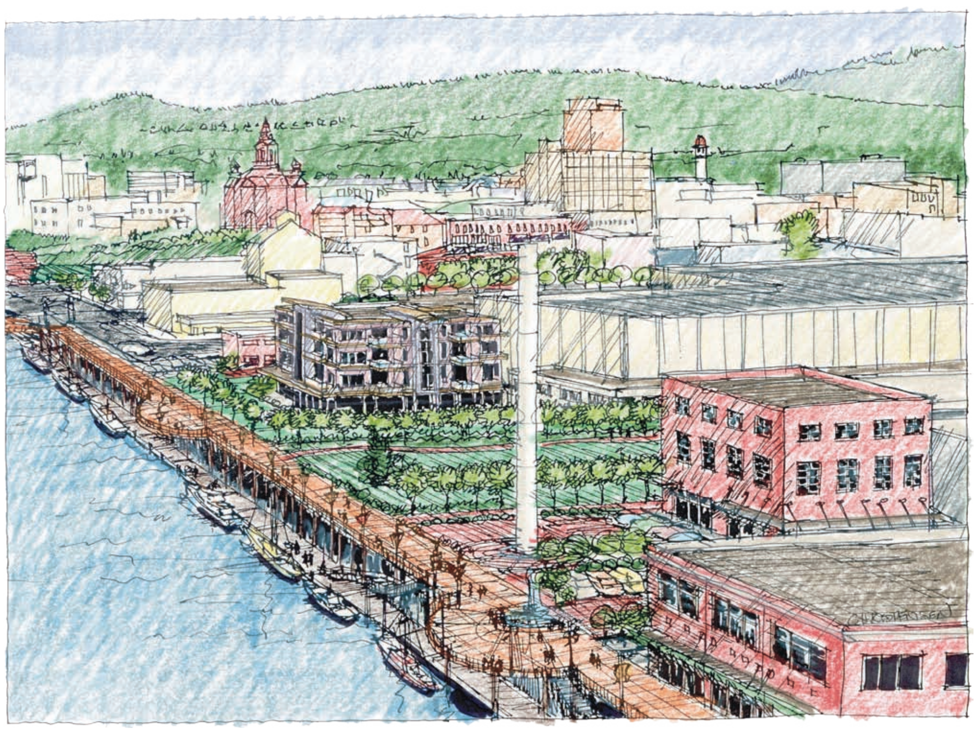
## Improve Waterfront Access

1. Develop strong connections between uplands and water.
   - Utilize existing streets to make pedestrian and vehicle connections to and from adjacent districts and neighborhoods
   - Identify areas where pedestrian access is provided when not in use for commercial/industrial purposes
   - Provide transient moorage with easy access from water to upland services
2. Provide links to regional trail systems.
3. Provide multiple modes of access to each area of the waterfront.
   - Create and establish circulation routes
   - Preserve transportation corridor on railroad right-of-way
   - Cluster shared parking away from the water
4. Provide convenient connections between different modes of transportation (jitney/bus).




**Section looking northeast (Whatcom Creek Waterway on left, Railroad Avenue on right)**

5. Create and connect large and small parks and open spaces with a "braided" system of pedestrian trails.
   - Create water-oriented parks and open spaces
   - Connect parks and open spaces with walkways and bikeways through the City Center neighborhood
6. Enhance opportunities for visual access to waterfront areas.
   - Preserve, improve and create public views to and from the waterfront
7. Provide the opportunity to walk the waterfront while respecting natural habitat.
   - Provide viewing that respects industrial activity areas
8. Help people find their way.
9. Provide way finding for the Coast Millennium Trail as a route that follows existing and proposed trails.
10. Explore the concept of public access "banking" and other financing incentives for improving public access.
11. Protect and enhance shoreline environmental resources when designing for shoreline access and upland development.



**View along Whatcom Creek Waterway looking toward downtown, with transient moorage, mixed-use development.**

## Promote a Healthy & Dynamic Waterfront Economy

1. Create new mixed-use areas on the waterfront for commercial, industrial, educational, recreational and residential uses.
   - Encourage reuse and renovation of existing buildings
   - Identify, preserve and locate sites for water-dependent uses
   - Complement existing downtown area with waterfront redevelopment
   - Support water-dependent activities and uses
   - Retain deep water moorage and entitlement
2. Support water-dependent activities and uses.
3. Create conditions attractive to jobs of the future.
   - Create a vision for desired businesses and educational facilities
4. Strengthen the tie between local jobs and resources.
   - Encourage and promote fisheries and ocean-related research industries and facilities
   - Encourage a range of development and businesses that foster apprenticeships and other educational and training opportunities
5. Provide public amenities and infrastructure to support redevelopment.
6. Improve permitting processes to achieve the goals and principles of the Waterfront Vision.
   - Promote a "business incubator" model with access to development resources
   - Create flexible zoning in the City Center
7. Explore economic spin-off related to Bellingham Bay Pilot cleanup strategies.
8. Provide incentives and credits for "green" buildings.

# RECOMMENDATIONS

## Future Uses

- When the Georgic Pacific tissue plant closes, use the site of the tissue warehouse for a combination of public uses which could include neighborhood gathering places, community facilities, sites for dry stack boat storage and support facilities for a new marina at the ASB site.
- Provide sites for water-dependent uses along both the I & J Waterway and the Whatcom Creek Waterway on either side of the ASB peninsula.
- Create beach areas with small parking lots on either side of the ASB site and at the end of Wharf Street adjacent to the Cornwall Landfill.
- Relocate rail road tracks from the Georgic Pacific site to the base of the bluff.
- To cluster shared parking away from the water, consider locating public parking to buffer development areas from the railroad and the Co-Gen plant.

## Future Development

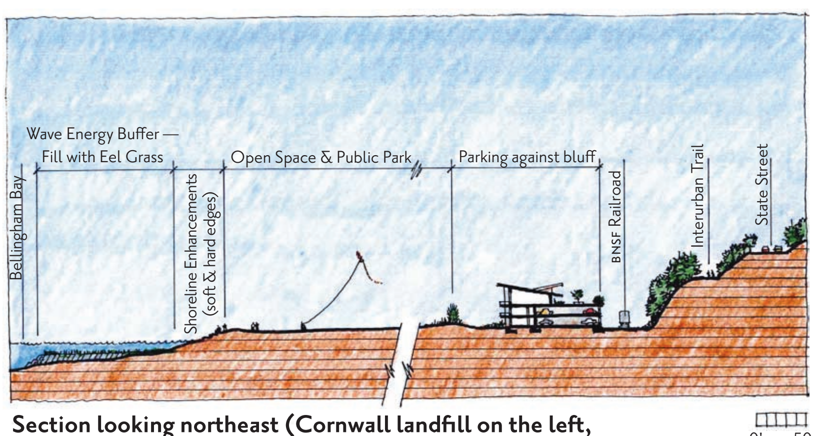
- Provide a site for Western Washington University expansion at the foot of Pine Street and the water's edge.
- Provide for a range of education and research facilities.
- Retain sufficient water depth in I & J and Whatcom waterways to support existing and future water-related uses.
- Create a public renewal authority or use other methods to develop a plan for the City Center area and to coordinate its implementation.
- Purchase the Georgia Pacific site and put it in public ownership to assure that the long term community interest is served.
- Create expedited review and permitting procedures for redevelopment that is consistent with an adopted renewal plan.
- Provide a location for a potential terraquarium as well as other potential cultural facilities.
- Provide an enhanced beach at the north end of the site, and locations for a potential terraquarium as well as a potential Native American cultural facility.
- Coordinate with the Economic Development Council to publicize local resources and maximize use of locally based contractors.
- Accommodate mixed-use development on uplands adjacent to Cornwall Avenue landfill site.
- Along Whatcom Waterway water-related commercial/industrial development may incorporate some residential components.

## Natural Systems & Environmental Cleanup

- Clean up contamination outside of the ASB on the bay side.
- Remove all contaminated sediment from the ASB and reconnect with Bellingham Bay.
- Examine implications of leaving the Whatcom Waterway sediment in place.
- Remove creosote piles from intertidal and subtidal areas near RG Haley site.
- Protect habitat enhancements at the log pond site and extend habitat and beach enhancement into upland areas.
- Cap the Cornwall Avenue landfill and provide marine habitat enhancement and a new public open space along the water for the length of the site.
- Examine contamination levels to help shape renewal master plan and then tailor remediation to planned use.
- Restore beaches where possible.
- Investigate opportunities for stormwater treatment and creation of marsh habitat using treated stormwater at outfalls and adjacent to open space areas.

## Culture & History

- Collaborate with Native American neighbors.
- Preserve the train depot building off Holly Street.



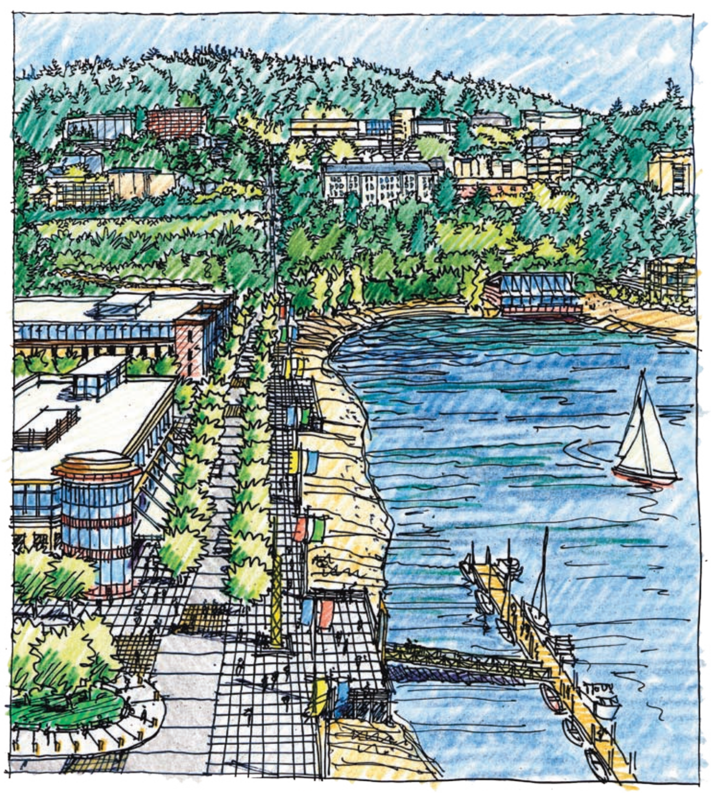

**Section looking northeast (Cornwall landfill on the left, State Street on the right)**

## Water Connections

- Provide transient moorage adjacent to Central Avenue on the south side of the Whatcom Waterway and on the west side of Whatcom Waterway while avoiding critical habitat areas. Habitat enhancement will be a condition of this new transient moorage provision.
- Locate transient moorage east of shipping terminal pier.
- Provide water jitney stops at Whatcom Creek Waterway adjacent to Central and Roeder Avenues and on the east side of the shipping terminal pier.
- Provide hand-carry boat landings on either side of the ASB peninsula and at the Cornwall Avenue landfill.
- Remove the sewer pipe under Roeder Avenue Bridge which blocks wate-side access to Whatcom Creek estuary.

## Vehicular Connections

- Maintain truck access to the shipping terminal.
- Change Chestnut Street to two-way.
- Maintain Cornwall Avenue and Wharf Street and extend Commercial Avenue and Laurel Street as auto access routes to the City Center waterfront.



**View toward arboretum and WWU from the waterfront. New university facilities in foreground at left; terraquarium on beach.**

**Public promenade.**

- Extend Commercial Street over the railroad to an intersection with an extended Laurel Street.
- Extend Laurel Street over the bluff and relocated railroad to intersect with an extended Commercial Street.
- Design the Commercial Street extension to retain a view of Mount Baker Theatre from the Laurel/Commercial Street intersection.

## Pedestrian Connections

- Provide a site for Western Washington University expansion at the foot of Pine Street and the water's edge.
- Add a vertical connection at the south end of the Cornwall Landfill over the railroad and up the hill.
- Establish an over-water pathway from the Cornwall Landfill to Boulevard Park.
- Connect new pedestrian routes through the City Center waterfront to regional trail systems and provide streetscape improvements conducive to year-round pedestrian use.
- Provide pedestrian routes along the extended rights-of-way of F, C, Central, Commercial and Pine streets.
- Develop safe connections over railroad tracks.
- Provide for direct access to Western Washington University including an on the ground or surface hill climb assist/corridor connection up Pine Street.

## Parks & Public Space

- Create a system of connected public open spaces between the Whatcom Waterway and the south end of the Cornwall Avenue landfill.
- Develop public open spaces along the waterfront.
- Create a public gathering space adjacent to the shipping terminal while retaining its availability for vessel staging.
- Provide an enhanced beach south of the shipping terminal at the base of Pine Street and Cornwall.

**THE SOUTH HILL AND BOULEVARD WATERFRONT** will continue to be an area of open space, transportation connections, enhanced habitat and recreation. The vision for the area seeks to build upon and enhance these qualities. Connections between Fairhaven and the City Center will be reinforced with trail and transit improvements, including an over-water walkway between Boulevard Park and the Taylor Avenue Dock. Upland connections over the railroad and to the water will also be improved, and woodland vegetation on the hillside will be preserved. Beaches will be improved and hardened shorelines will be softened, while marine habitat will be enhanced wherever possible.

**Over-water pedestrian walkway leading toward downtown.**

# South Hill & Boulevard

# GUIDING PRINCIPLES

## Reinforce the Inherent Qualities of Each Place on the Waterfront

1. Make the waterfront a regular part of the lives of more people.
2. Respect history, cultures and the arts.
   - Embrace, include and expand upon knowledge of cultural and historical past
3. Make the waterfront inviting to people on foot.
   - Improve existing and develop new pedestrian connections between the neighborhoods on the bluff and the water
4. Reinforce a unique "sense of place" at different waterfront locations.
   - Preserve the sense of forested continuity along the hillside to the water
5. Complement adjacent uses.

## Restore the Health of Land & Water

1. Enhance or reintroduce natural systems.
   - Expand on the habitat restoration along the shoreline
   - Expand and enhance eelgrass beds along the near shore
2. Create and restore habitat wherever possible.
3. Remediate upland and in-water contamination.
4. Protect existing natural shorelines.
5. Seek opportunities to soften existing hardened shorelines.
6. Tailor environmental cleanup strategies and remediation to planned use.
7. Manage stormwater retention and treatment to enhance estuarine habitats.
   - Treated or otherwise, assure the quality of stormwater used to enhance estuarine habitats
8. Require sustainable practices in all development.
   - Continue using non-polluting structural materials in over-water path construction
   - Utilize native plants and water efficient landscaping
   - Promote non-vehicle transportation
9. Restore, enhance and expand sand and gravel beaches wherever possible.
10. Connect proposed open space and natural areas to regional open space network and wildlife corridors.
11. Explore mitigation banking and incentives (such as environmental credits) for environmental resource protection and enhancement prior to redevelopment.

## Improve Waterfront Access

1. Develop strong connections between uplands and water.
   - Reinforce connections between Fairhaven and City Center
2. Provide links to regional trail systems.
3. Provide multiple modes of access to each area of the waterfront.
   - Create small parking areas at the upland side of pedestrian routes to the water
4. Provide convenient connections between different modes of transportation (jitney/bus).
5. Create and connect large and small parks and open spaces with a "braided" system of pedestrian trails.
   - Expand upon the recreation activity at existing parks
   - Enhance existing open spaces
   - Promote opportunities for recreation
6. Enhance opportunities for visual access to waterfront areas.
7. Provide the opportunity to walk the waterfront while respecting natural habitat.
8. Help people find their way.
9. Provide way finding for the Coast Millennium Trail as a route that follows existing and proposed trails.
10. Explore the concept of public access "banking" and other financing incentives for improving public access.
11. Protect and enhance shoreline environmental resources when designing for shoreline access and upland development.

# RECOMMENDATIONS

## Culture & History

- Collaborate with Native American neighbors.
- Conduct an inventory to identify all the historic and native sites.

## Connections

- Construct an over-water trail to connect Boulevard Park to the Cornwall Landfill similar to the over water connection from Boulevard Park to Taylor Avenue Dock.
- Provide transit stops along State Street at waterfront trail connections.
- Improve a hand-carry boat landing area at Boulevard Park.
- Introduce more native plants in the park.
- Create water jitney stops at the north end of Boulevard Park and at the Taylor Avenue Dock.
- Create parking improvements along 10th Street.
- Designate a bike path between City Center and Fairhaven.
- Increase pedestrian corridors up the hill particularly between South Hill/Western neighborhoods and the waterfront.

**Water-taxi stop at Boulevard Park.**

## Natural Systems & Restoration

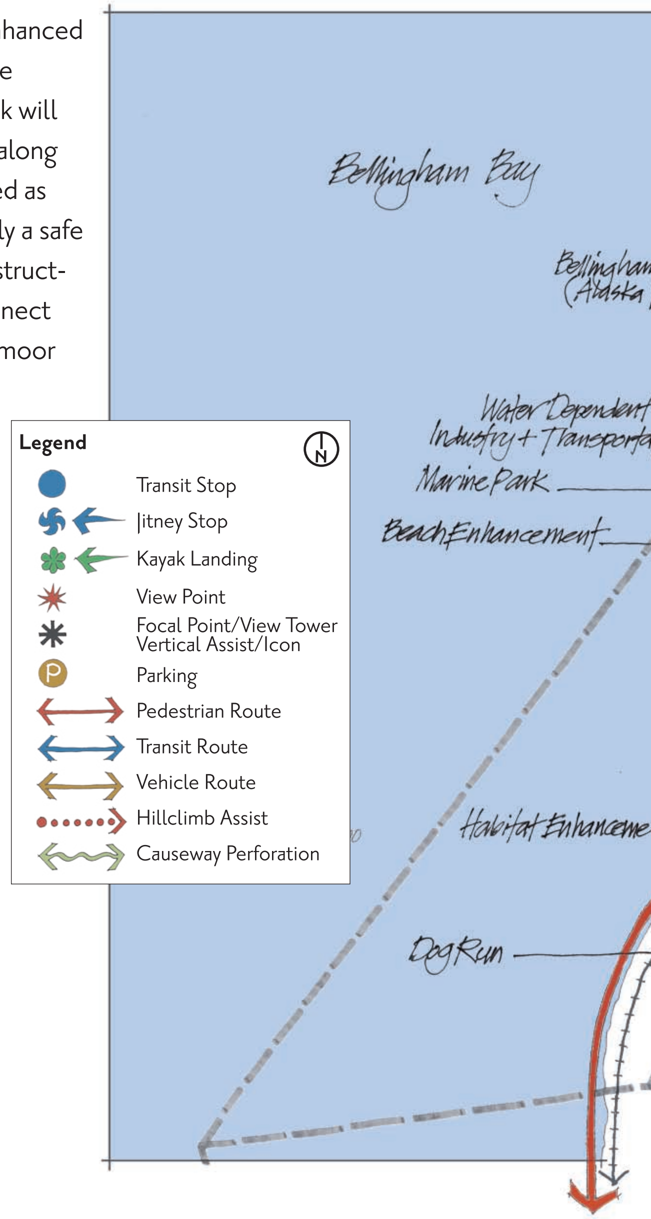
- Maintain separation between public access trails and the water's edge to protect land and water habitat areas from the south end of Cornwall Landfill to the north end of Boulevard Park.
- Remove creosote piling along shoreline between Boulevard Park and Cornwall Landfill.
- Reduce some of the grassy areas and hardened edges to create a more naturalized transition from grass to native plants, and native plants to beach.
- Recreate eelgrass beds along and near the shore.

## Future Uses

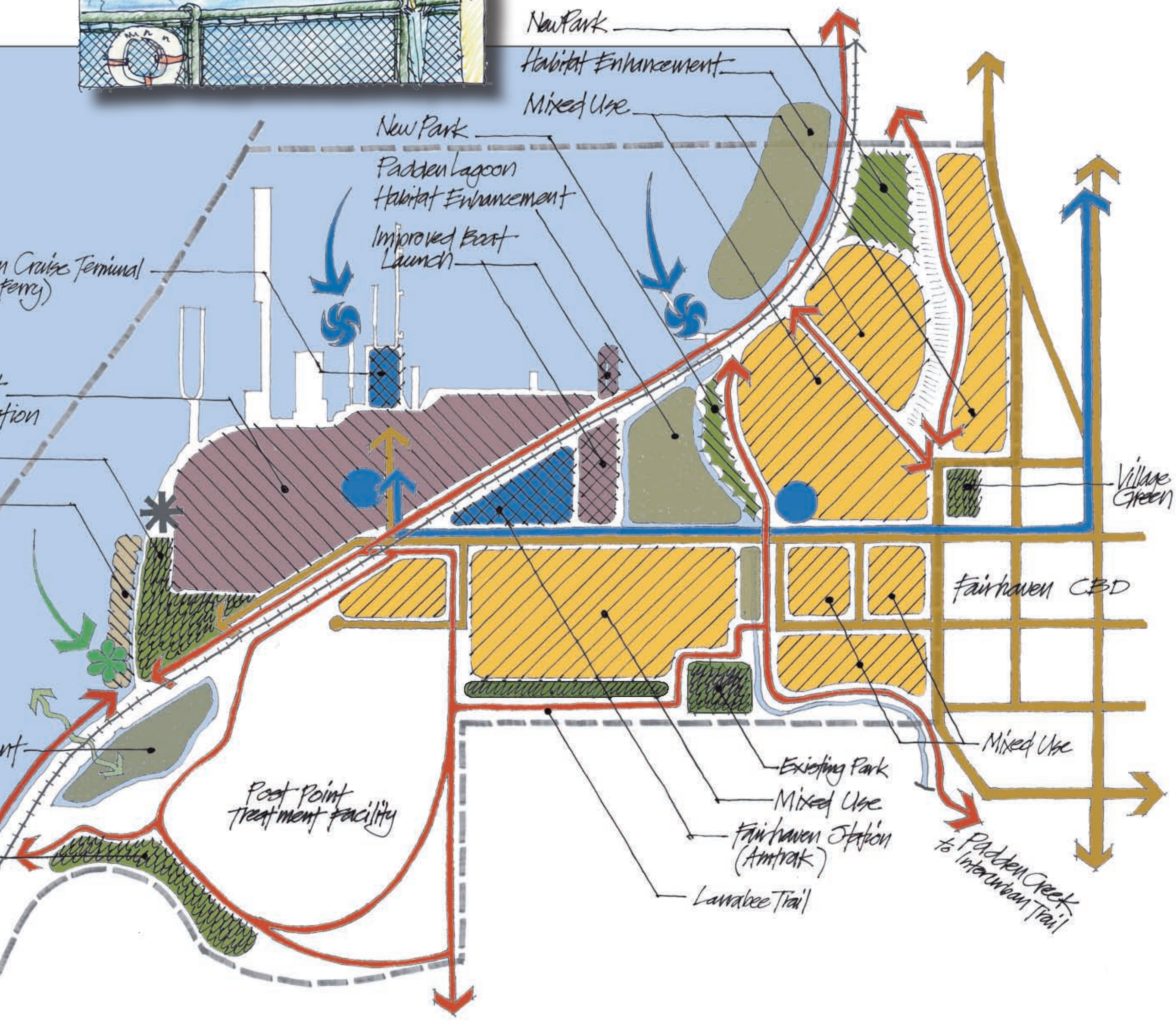
- Implement plans for the new park on city property south of the Taylor Avenue Dock and for the Floating Dock.
- Allow leases for food and beverage businesses that are appropriate to a pedestrian environment in the park.

**THE VISION FOR FAIRHAVEN** extends the pedestrian scale and character of the Fairhaven business district to the water. The existing mixture of maritime activities and transportation facilities across the tracks in the vicinity of the cruise terminal will remain, but the area between there and the business district will develop with a mixture of uses that will be more pedestrian-oriented, and will include improved pathways and connections to regional trails. The existing light industrial area east of Padden Creek Lagoon will be developed in a similar fashion, with a mixture of light industrial, commercial and residential uses.

Small boat launching, kayak landing and docking for multiple modes of water transportation will continue to be accommodated in Fairhaven, and good vehicular access to the transportation terminals will be maintained. Water flow in the lagoon will be improved, habitat will be enhanced and public access around the lagoon and up Padden Creek will be provided. The shoreline along Marine Park will be enhanced as marine habitat and eventually a safe water-level trail will be constructed through Fairhaven to connect to the Chuckanut and Edgemoor shoreline.



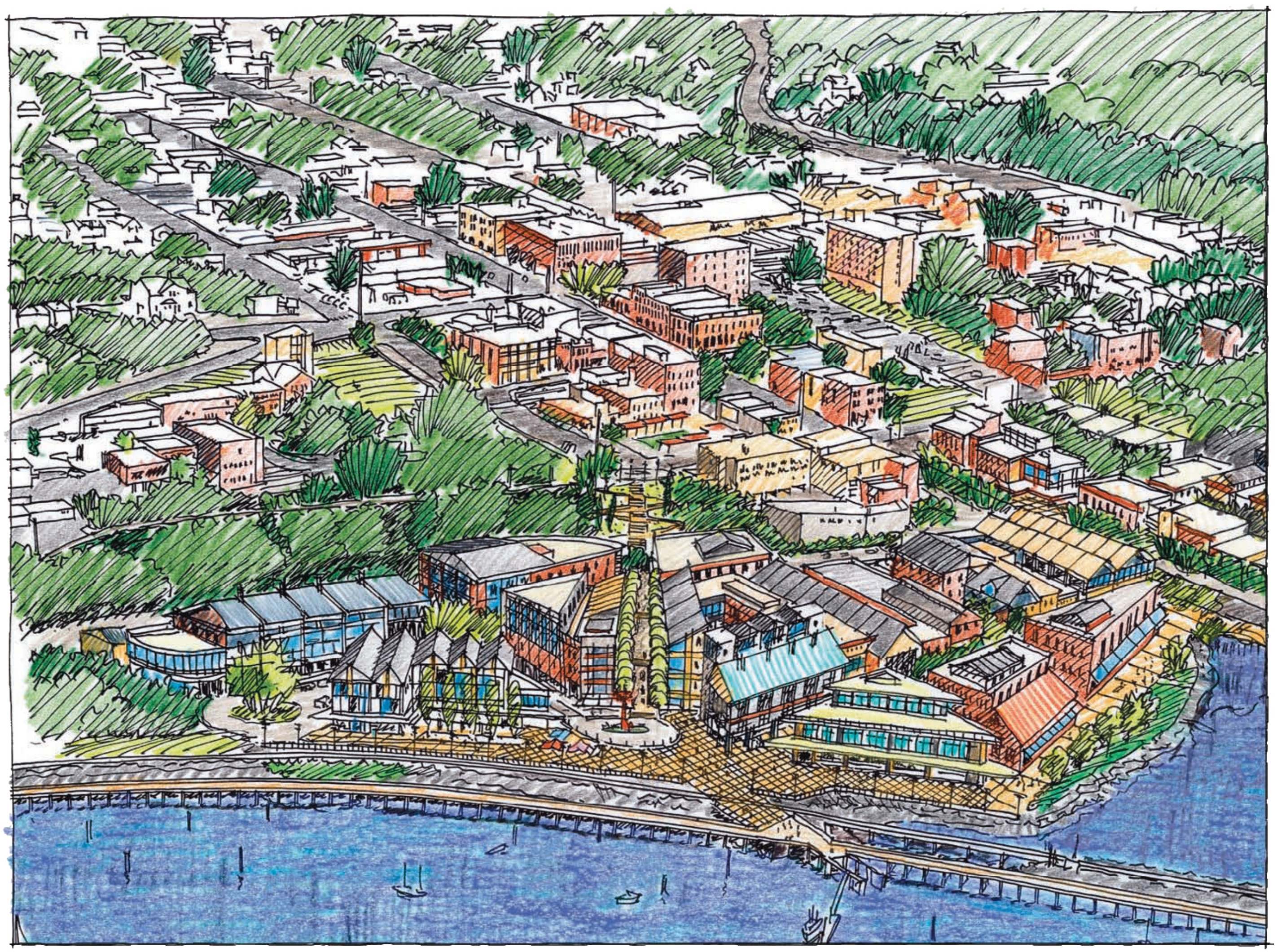
# Fairhaven


New Park
Habitat Enhancement
Mixed Use
New Park
Padden Lagoon
Habitat Enhancement
Improved Boat
Launch
Cruise Terminal
Village
Green
Fairhaven CBD
Post Point
Treatment Facility
Mixed Use
Existing Park
Mixed Use
Fairhaven Station
(Amtrak)
Larrabee Trail
Padden Creek
to Interurban Trail

# GUIDING PRINCIPLES

## Reinforce the Inherent Qualities of Each Place on the Waterfront

1. Make the waterfront a regular part of the lives of more people.
2. Respect history, cultures and the arts.
   - Embrace, include and expand knowledge of cultural past
3. Make the waterfront inviting to people on foot.
   - Accommodate transportation routes with minimum disruption to pedestrian character
4. Reinforce a unique "sense of place" at different waterfront locations.
   - Support the continuation of water and industry-dependant uses
   - Promote a balanced mix of commercial, retail, housing, light industry, marine-related businesses, transportation facilities and recreation
   - Enhance open spaces
5. Complement adjacent uses.



**View from water of mixed-use development & park redevelopment with pedestrian connection to Fairhaven business district & the Village Green.**

### Restore the Health of Land & Water

1. Enhance or reintroduce natural systems.
2. Create and restore habitat wherever possible.
3. Remediate upland and in-water contamination.
4. Protect existing natural shorelines.
5. Seek opportunities to soften existing hardened shorelines.
6. Tailor environmental cleanup strategies and remediation to planned use.
7. Manage stormwater to enhance estuarine habitats.
   - Treated or otherwise, assure the quality of stormwater used to enhance estuarine habitats
8. Require sustainable practices in all development.
   - Place a premium on indoor air quality and control of noise, light, and other pollutants in building construction and use
   - Divert as much waste as possible from landfills through reuse and remanufacturing
   - Employ developed techniques for water use reduction
9. Restore, enhance and expand beaches wherever possible.
10. Connect proposed open space and natural areas to regional open space network and wildlife corridors.
11. Explore mitigation banking and incentives (such as environmental credits) for environmental resource protection and enhancement prior to redevelopment.

### Improve Waterfront Access

1. Develop strong connections between uplands and water.
2. Provide links to regional trail systems.
3. Provide multiple modes of access to each area of the waterfront.
   - Reinforce existing multimodal transportation facilities
4. Provide convenient connections between different modes of transportation (jitney/bus).
5. Create and connect large and small parks and open spaces with a “braided” system of pedestrian trails.
6. Enhance opportunities for visual access to and from waterfront areas.
7. Provide the opportunity to walk the waterfront while respecting natural habitat.
   - Provide viewing that respects industrial activity areas
8. Provide safe viewing of industrial activity.
9. Help people find their way.
10. Provide way finding for the Coast Millennium Trail as a route that follows existing and proposed trails.
11. Explore the concept of public access “banking” and other financing incentives for improving public access.
12. Protect and enhance shoreline environmental resources when designing for shoreline access and upland development.

### Promote a Healthy & Dynamic Waterfront Economy

1. Create new mixed-use areas on the waterfront for commercial, industrial, educational, recreational and residential uses.
   - Establish clear and definitive design and development guidelines
2. Support water-dependent activities and uses.
   - Maintain vehicle access to current and future water transportation
   - Encourage marine/boat-oriented facilities with ancillary services
   - Support water-related business uses and tourism
3. Create conditions attractive to jobs of the future.
4. Strengthen the tie between local jobs and resources.
5. Provide public amenities and infra-structure to support redevelopment.
6. Improve permitting processes to achieve the goals and principles of the Waterfront Vision.
7. Explore economic spin-off related to Bellingham Bay Pilot cleanup strategies.
8. Provide incentives and credits for “green” buildings.

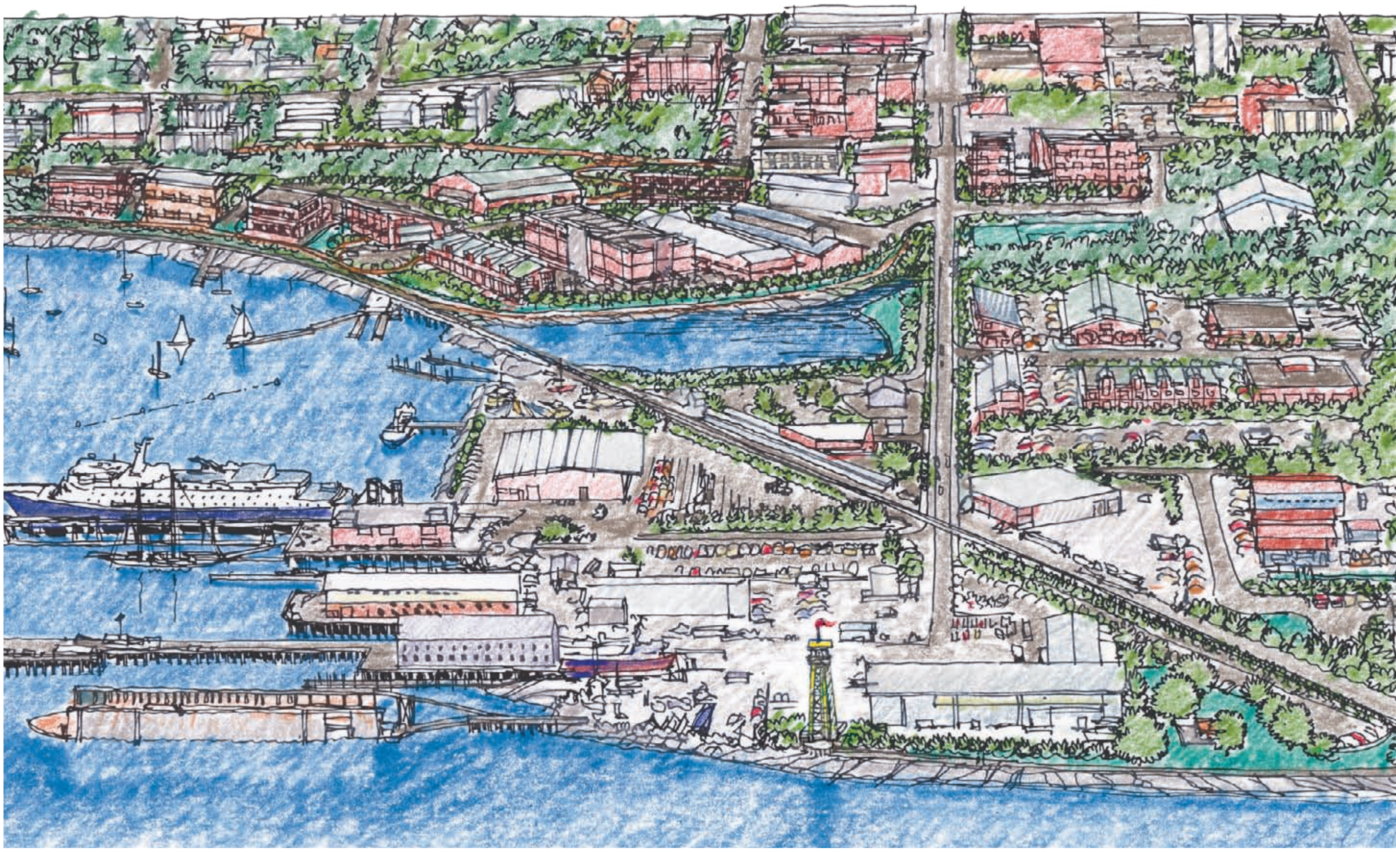
# RECOMMENDATIONS

## Future Development

- Allow for transitions in building scale and character as you travel between Fairhaven and the waterfront.
- Extend the streetscape from the center of Fairhaven into major areas to create a "finer grain" scale of buildings and circulation.
- Encourage mixed-use development in the existing Port light industrial area east of Padden Lagoon and the undeveloped property along the south side of Harris Avenue west of the center of Fairhaven.
- Provide priority for marine-related uses without excluding other uses.
- Assist and guide new development by providing appropriate infrastructure, design guidelines, zoning and permitting processes.

## Future Uses

- Support creation of a new park between the bluff and railroad north of the Port's existing light industrial area.
- Preserve areas adjacent to deep water for water-dependent uses.
- Explore moving the outer harbor line adjacent to the ship repair yard.
- Provide for small, decentralized parking facilities, encourage shared parking and tailor parking solutions to central and remote locations.
- Enhance open space areas along Padden Creek.
- Identify more areas for upland boat storage in areas designated for water-dependent uses.



**View looking up Harris toward Fairhaven showing new development, railroad station, boat launch, ferry terminal, Padden Lagoon habitat enhancement & observation tower at Marine Park in foreground.**

### Environmental Cleanup & Enhancement

- Naturalize the area along the east side of Padden Lagoon.
- Enhance the estuary lagoon at Padden Creek, increase water flow through the railroad causeway and protect and enhance eelgrass beds in the adjacent near shore areas.
- Naturalize the shoreline area between the launch ramp and the cruise terminal.
- Protect and enhance eelgrass beds in the near shore adjacent to Marine Park and support plans to create a softened edge along the shoreline.
- Protect Post Point Lagoon from pollutants.
- Protect natural areas by enhancing or reintroducing native vegetation.
- Utilize stormwater as a sustainable asset.

### Culture & History

- Collaborate with Native American neighbors.
- Conduct an inventory to identify all the historic and native sites and continue the practice of historic markers and protect existing known archeological site.

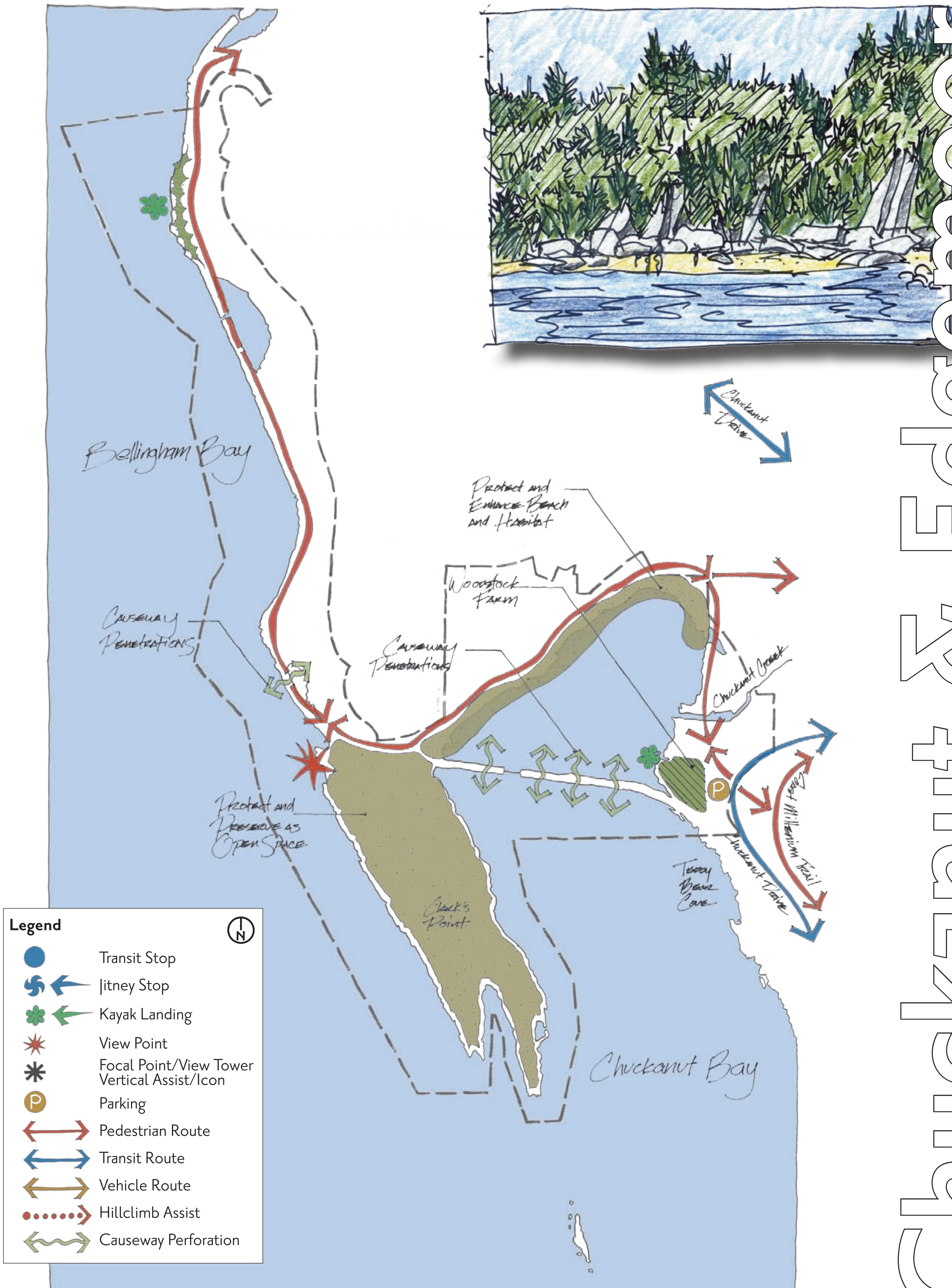
### Connections & Access

- Provide a direct connection from Village Green and the rest of Fairhaven, diagonally northwest to the waterfront.
- Provide improved pedestrian pathways between Fairhaven and the railroad station and cruise terminal.
- Explore feasibility and methods for constructing a safe and convenient waterside trail near the railroad right-of-way through Fairhaven to connect to Edgemoor and Chuckanut Bay.
- Develop trail connections from Taylor Avenue Dock south through Fairhaven and redeveloped areas near the water to complete the South Bay link of the Coast Millennium Trail.
- Provide water jitney stops at Padden Lagoon and the public boat dock adjacent to the cruise terminal.
- Reconfigure and improve the existing public boat launch ramp, while providing for more short term and transient moorage.
- Reserve the 8th Street right-of-way for native vegetation as a transition to adjacent development.
- Explore potential for Port to use portion of Alaska ferry parking lots south of Harris for boat trailer parking.
- Provide bus stops in close proximity to water jitney stops.

**THE VISION FOR CHUCKANUT AND EDGEMOOR** is one that emphasizes conservation and public access. The rugged shoreline and tidelands will remain accessible only by water or on foot. Eventually a safe water-grade trail is envisioned that will connect to both Fairhaven and the Coast Millennium Trail near Woodstock Farm. Woodstock Farm will become a new city park, and the railroad causeway across Chuckanut Bay will be perforated to improve water flow and allow for marine habitat enhancement. Kayak and other hand-carry landings will give boaters access to various points along the shoreline.

**Looking south across Chuckanut Bay at railroad causeway penetrations, beach enhancements & Woodstock Farm.**

# Chuckanut & Edgemoor



# GUIDING PRINCIPLES

### Reinforce the Inherent Qualities of Each Place on the Waterfront

1. Make the waterfront a regular part of the lives of more people.
2. Respect history, cultures and the arts.
   - Embrace, include and expand knowledge of cultural past
3. Make the waterfront inviting to people on foot.
4. Reinforce a unique "sense of place" at different waterfront locations.
   - Protect the rugged shoreline and expansive tidelands, and preserve the natural features of the area
   - Preserve as a conservation area
5. Complement adjacent uses.

### Restore the Health of Land & Water

1. Enhance or reintroduce natural systems.
2. Create and restore habitat wherever possible.
3. Remediate upland and in-water contamination.
4. Protect existing natural shorelines.
   - Preserve and protect the natural resources while improving public access by foot or hand-carry boats
5. Seek opportunities to soften existing hardened shorelines.
6. Tailor environmental cleanup strategies and remediation to planned use.
7. Manage stormwater to enhance estuarine habitats.
   - Treated or otherwise, assure the quality of stormwater used to enhance estuarine habitats
8. Require sustainable practices in all development.
   - Use local and rapidly renewable materials for construction
9. Restore, enhance and expand beaches wherever possible.
10. Connect proposed open space and natural areas to regional open space network and wildlife corridors.
11. Explore mitigation banking and incentives (such as environmental credits) for environmental resource protection and enhancement prior to redevelopment.

### Improve Waterfront Access

1. Develop strong connections between uplands and water.
2. Provide links to regional trail systems.
3. Provide multiple modes of access to each area of the waterfront.
   - Provide new and improve existing boating access points
4. Provide convenient connections between different modes of transportation (jitney/bus).
5. Create and connect large and small parks and open spaces with a "braided" system of pedestrian trails.
6. Enhance opportunities for visual access to waterfront areas.
7. Provide the opportunity to walk the waterfront while respecting natural habitat.
8. Help people find their way.
   - Provide pockets of open space along the shoreline trail where opportunities exist
9. Provide way finding for the Coast Millennium Trail as a route that follows existing and proposed trails.
10. Explore the concept of public access "banking" and other financing incentives for improving public access.
11. Protect and enhance shoreline environmental resources when designing for shoreline access and upland development.

# RECOMMENDATIONS

## Connections

- Develop a trail connector above the rail tunnel to a viewpoint overlooking Bellingham Bay.
- Explore feasibility of constructing a safe and convenient pedestrian trail adjacent to the rail road right-of-way.
- Provide hand-carry boat landings at Poe's Point and Woodstock Farm.
- Extend public access along the water from Fairhaven to Chuckanut Bay to connect to the Coast Millennium Trail near Woodstock Farm.
- Improve pedestrian access from parking areas along Chuckanut Drive.
- Continue to negotiate for upland trail to and from Chuckanut Bay.
- Develop short term and drop off parking at Woodstock Farm.
- Connect Arroyo Park/Interurban Trail to Chuckanut Bay/Inspiration Point.
- Develop a connection/strong link to Chuckanut Mountain and Larrabee State Park.
- Develop parking with trailhead amenities at North Chuckanut Mountain near California Street.

## Natural Systems Protection & Open Space

- Perforate the railroad causeways across Chuckanut Bay to improve water circulation and reduce siltation.
- Maintain Clark's Point as an open space resource.
- Complete master planning and implementation of the Woodstock Farm as a new city park.
- Address septic tank contamination in Chuckanut Bay.

## Culture & History

- Collaborate with Native American neighbors.
- Conduct an inventory to identify all the historic and native sites.
- Locate heritage center at Woodstock Farm.

Appendix Materials

The following information is available through the Bellingham Public Library System.

1. **Waterfront Futures Project Background Information**
   - Scope of Work and Inter-local Agreement
   - Waterfront Futures Project Frequently Asked Questions
   - Waterfront Futures Group members
   - Waterfront Futures Project Schedule Recap
   - PRR Consultant Team members
   - Acknowledgements
   - WFG Retreat Materials
   - List of publications by the Futures Project
   - List of Business and Property Owners Interviewed
   - Existing Documents referenced by the WFG
2. **White Papers and Public Comment**
   - Agendas, Minutes, Meetings and list of Guest Forums
   - Public Comment
   - White Papers
   - Draft Plan public comment: June — September 2004
3. **Reports and Publications**
   - Waterfront Employment Survey by Brian Wilmot
   - Research on the Railroad by Stacy Fawell
   - WFG Work Group Initial Findings Reports
   - Waterfront Center Report
   - Design Assistance Team Report
   - Interagency Environmental Workshop Report
   - Map Appendix from Environmental Workshop
   - Waterfront Guide
   - WFG Annual Reports for 2003 and 2004
4. **WFG Draft Recommendations and Comment**
   - Draft Waterfront Vision
   - Draft Waterfront Framework Plan
   - Draft Waterfront Framework Plan Update – June 24, 2004
   - Draft Waterfront Action Plan
   - Draft Plan public comment (See Section 2 above.)
5. **Documents on CD**
   - Waterfront Futures Project Background Information
   - Background Maps, pictures, and sketches
   - Public Process & Education and Outreach
   - Other Publications and Reports
   - WFG Draft Recommendations and Comment
   - WFG Final Recommendations
6. **WFG Final Recommendations**
   - Waterfront Vision
   - Waterfront Vision and Framework Plan – December 2004
   - Waterfront Action Plan – December 2004

# Acknowledgments

## Waterfront Futures Group Members

Art Anderson (Chair), Lydia Bennett (Vice-chair), John Blethen, Jay Bornstein, Craig Cole (2003), Bob Edie, Darrell Hillaire, Steve Koch, John Macpherson, Lynne Masland, Ted Mischaikov, Ray Tryznka

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Facilities – Fred Seeger, Susan French, Karen Callery

Environmental Services – Mike Stoner

Technical Assistance – Tim Cool

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## City of Bellingham

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Planning and Community Development – Jorge Vega, Greg Aucutt, Chris Behee, Kate Exall, Sheila Hardy, Chris Spens, Steve Sundin

Library – Julie Carterson, Gayle Helgoe, Marc Poulson

Finance – Therese Holm, Tammy Schoonover

Public Works – Dick McKinley, Clare Fogelsong, Clark Williams, Brent Baldwin

Museum – Tom Livesay, Jeff Jewell

Parks and Recreation – Paul Leuthold, Tim Wahl, Leslie Bryson

ITSD – Jim Baird, Patrick Lord, Cheryl Lord, Jackie Rimmer, Steve Niedermeyer, Daniel Meester

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PRR Consultant Team and staff – Marcia Wagoner, Jerry Ernst, Dennis Haskell, Susan H. Jones, Jeff Benesi, Michael Read, Dave Christensen, Robin Hoff, Jaime Smith

Retreat, Meeting Planning and Facilitation – Resolution Services (Rob Kelley, Mary Dumas) and CDM (Dave Christensen)

Website Design – Andrew McGlone, Kevin Marshall

Information brochures, notices, ad text – Wordworks (Chris Berner)

Environmental Workshop Report – Anchor Environmental Services (Peter Hummel), Coastal Geological Services (Jim Johannessen) and Fairbanks Environmental Services (Chris Fairbanks)

Design Assistance Team Facilitation and Report – Jerry Ernst, AIA

Consultant Visit and Report – Waterfront Center (Ann Breen, Dick Rigby)

## Other Service Providers

Videotaping and Production for Guest Forums – Vidsmith (Lars Kongshaug)

Videotape Reproduction and Airing – COB-EGTV (Jim Baird)

Printing Services and Supplies – Kinko's, Copies Now, Applied Digital, Affordable Business Solutions

Public Meeting and Event Mailings – Automated Mailing Services

Project Assistance and Research – Jori Burnett, Stacey Fawell, Brian Wilmot

Catering – Sandwich Odyssey, Pacific Café, Food Pavilion, Fairhaven Market, Bagelry, Hotel Bellwether

## APPENDIX C

## MEMORANDUM OF UNDERSTANDING BY AND BETWEEN THE PORT OF BELLINGHAM AND THE DEPARTMENT OF NATURAL RESOURCES

This Memorandum of Understanding was executed between the Port and the Department of Natural Resources in November of 2005 in support of cooperative efforts to achieve environmental and land use goals in Bellingham Bay.

MEMORANDUM OF UNDERSTANDING
BY AND BETWEEN
THE PORT OF BELLINGHAM
AND
THE DEPARTMENT OF NATURAL RESOURCES

This Memorandum of Understanding is executed by and between the Department of Natural Resources and the Port of Bellingham in support of cooperative efforts to achieve environmental and land use goals in Bellingham Bay.

**WHEREAS**, the Port of Bellingham (Port) and the Department of Natural Resources (DNR) have been active partners in the Bellingham Bay Demonstration Pilot (Pilot), a cooperative approach to clean up historical contamination problems, restore habitat, and revitalize the community's waterfront; and

**WHEREAS**, the Whatcom County economy has been affected by a steady decline in heavy industrial uses of the downtown Bellingham waterfront and an increased demand for marina facilities and public access; and

**WHEREAS**, the Port and City of Bellingham (City) sponsored a local community visioning process, resulting in the Waterfront Futures Group Vision and Framework Plan with recommendations to change the downtown Bellingham waterfront from exclusively industrial uses to a mix of businesses, commercial, light industrial, residential and public access; and

**WHEREAS**, the Port and City have initiated a process to address these changing land use needs, including updates to the Comprehensive Land Use Plan for the waterfront areas, the Shoreline Master Program, the Comprehensive Scheme of Harbor Improvements and other local land use plans; and

**WHEREAS**, the Port has made a substantial commitment to achieving the community's vision by acquiring 137 acres of waterfront property previously owned by the Georgia-Pacific Corporation in exchange for responsibility to meet certain regulatory cleanup requirements; and

**WHEREAS**, DNR is an essential and strategic partner in the effort to implement the community's vision for revitalizing the Bellingham waterfront, because of DNR's jurisdiction over state harbor areas, waterways and other state-owned aquatic land; and

**WHEREAS**, DNR and the Port recognize that the current federal channel, state waterway and harbor area designations need to be updated to better reflect the current changes in the local economy, land uses, land use plans and navigation needs for the community waterfront; and

**WHEREAS**, DNR and the Port further recognize that the successful accomplishment of the community's vision for waterfront revitalization will require coordination and consistency between regulatory decisions for contaminated site remediation under the Bellingham Bay Demonstration Pilot and regulatory land use changes under federal, state and local authorities; and,

**NOW, THEREFORE**, the Port and DNR hereby desire to set forth their mutual understandings with regard to the matters addressed herein:

1. The Port and DNR reaffirm their commitment to the goals and objectives of the Bellingham Bay Pilot Project and to work cooperatively to accomplish environmental remediation, habitat restoration and the enhancement of appropriate waterfront land uses within Bellingham Bay.

2. The Port and DNR will coordinate their efforts to update harbor lines consistent with and supporting of the recommendations and findings of the community land use planning process. Such harbor line updates are expected to include relocation of the outer harbor line and portions of the inner harbor line.

3. The Port and DNR will coordinate their efforts to initiate a reauthorization of the federal navigation channel located in the Whatcom Waterway to ensure that these channel dimensions are appropriate to the needs of the community. It is anticipated that the channel reauthorization will modify the channel dimensions, and may de-authorize portions of the channel between Roeder Avenue and the Bellingham Shipping Terminal. The current channel designations in this area have never been fully implemented due to a lack of the requisite shoreline infrastructure, and the channel designations have become obsolete due to changing land use and navigation needs. Updating the channel designations through reauthorization will better support the community land use vision and the implementation of the cleanup, habitat restoration and land use objectives of the Pilot.

4. The Port and DNR will coordinate their efforts to update state waterway designations in the Whatcom, I&J and/or Squalicum Waterways. Some state waterway areas may be vacated by the state and converted to first class tideland status. Changes to state waterway designations will be consistent with the land use planning process and will comply with DNR constitutional and statutory requirements and DNR aquatic land management objectives.

5. The Port and DNR intend to explore potential land exchanges and/or joint development agreements where such actions would better support the implementation of the community land use vision and where such actions support DNR's aquatic land management objectives. Such exchanges may include properties located in the current harbor area and/or vacated portions of state waterways, if these areas have been converted to first-class tidelands.

6. The Port and DNR intend to continue working cooperatively to accomplish the environmental remediation of multiple sites, including but not necessarily limited to the Whatcom Waterway, the Cornwall Avenue Landfill, the I&J Waterway, and the Harris Avenue Shipyard sites. It is anticipated that such environmental remediation will optimize environmental protection consistent with MTCA and SEPA requirements, and will employ the appropriate use of multiple cleanup technologies. Where final environmental

remediation plans involve management in-place of impacted sediments, the Port and DNR will develop appropriate institutional controls. For those waterways where impacted sediments are managed in place, the Port will take full responsibility for implementing the cleanup and managing their long-term care.

7. The DNR and the Port agree that this Memorandum of Understanding sets forth the intention of each party and that the DNR and the Port will continue to work cooperatively to develop agreements and take actions that fulfill the understandings set forth herein.

8. The specific actions to be completed in fulfillment of this memorandum remain subject to the normal procedural reviews of the Port and DNR, including where appropriate the review and approval of the Board of Natural Resources and/or the review and approval of the Commission of the Port of Bellingham.

Dated this 30th day of November 2005.

THE DEPARTMENT OF NATURAL RESOURCES

Doug Sutherland

Commissioner of Public Lands

SEAL OF THE COMMISSIONER OF PUBLIC LANDS STATE OF WASHINGTON

**PORT OF BELLINGHAM**

Doug Smith, President

Board of Commissioners

## APPENDIX D

## DRAFT HABITAT MITIGATION FRAMEWORK GUIDELINES
## 2000 COMPREHENSIVE STRATEGY EIS

The Habitat Mitigation Framework Guidelines were produced as Appendix C the 2000 Comprehensive Strategy EIS. The Guidelines identify habitat restoration and enhancement opportunities and discuss the framework for conducting habitat mitigation.

# DRAFT HABITAT MITIGATION FRAMEWORK GUIDELINES

**Prepared by: The Pilot Team Habitat Subcommittee**

## INTRODUCTION

Aquatic habitat may be adversely impacted from implementation of the selected Integrated Near-Term Remedial Alternative, or through future development along the shoreline or in waters of Bellingham Bay that is not associated with sediment cleanup. Sediment disposal and/or future development may convert one habitat type to another, permanently alter, or permanently remove or eliminate habitat and habitat function. These types of habitat alterations may affect habitat types, area, functional performance, and/or the physical processes that are needed to maintain habitat and resources that rely on certain types of habitat.

The Habitat Documentation Report (PI Engineering and Anchor Environmental 1999) identifies objectives for sustaining habitat and aquatic resources and increasing habitat area and function in Bellingham Bay. They include:

- Provide clean sediments to support functions and species.
- Restore the 200+ acres of historical native eelgrass bed that was formerly located in inner Bellingham Bay to the extent possible.
- Restore/enhance degraded estuaries of Whatcom, Squalicum, Padden, and Little Squalicum
- Creeks to support salmonids, salmonid prey, and functions such as refuge, feeding, and rearing.
- Restore/enhance/protect viable habitat that provides connective corridors between estuary and open water habitats and between other habitats in the open water environment.
- Restore, protect, and enhance natural processes that create and maintain habitat.
- Endeavor for net gain in aquatic area and function.
- Preserve existing viable habitat that tends to either concentrate sensitive life history stages and/or supports large numbers of species of concern.
- Maximize habitat restoration/protection opportunities (including marine buffer) with remediation and/or shoreline projects.
- Restore lost habitat attributes by removing shoreline fills, shoreline landfills, removing remnant structures, and removing/replacing treated timber structures.

In addition, the Habitat Documentation Report identifies over 30 restoration and protection opportunities at specific locations within Bellingham Bay where one or more of these objectives could be met at a given location. These objectives and specific opportunities have been integrated into the Comprehensive Strategy for Bellingham Bay through a habitat evaluation in a baywide context for a sustainable aquatic ecosystem and improved habitat functions. It is important to realize that the habitat restoration opportunities identified in the Habitat Documentation Report are suggested restoration concepts and are not intended to be inclusive of all possibilities in the bay. They represent possibilities that were identified through the development of the Comprehensive Strategy and the draft EIS.

The Comprehensive Strategy for Bellingham Bay is designed to integrate a variety of environmental issues into one coordinated approach, creating a clear context for decisions within the bay. The environmental issues, (referred to as project elements), include sediment cleanup, control of contaminant sources, sediment disposal siting, habitat restoration, and land use activities that address commerce, navigation, and shoreline use. The Comprehensive Strategy is made up of a series of strategies. The series ranges from broad strategies that cover the entire Bellingham Bay study area and encompass a long-term planning horizon, to near-term actions that are focused on taking actions at specific locations throughout the bay.

## PURPOSE OF MITIGATION FRAMEWORK

The overriding purpose of this mitigation framework is to provide an ecosystem context for mitigation actions within Bellingham Bay. It provides more management and mitigation guidance and flexibility than would be possible through individual project consideration. This mitigation framework also provides guidance to project proponents that helps direct them towards implementing habitat actions that achieve the goals of the Pilot Project and Comprehensive Strategy, and provides incentives and disincentives for undertaking certain actions.

Several outcomes are anticipated through utilization of this mitigation framework by the regulatory agencies and the regulated community.

1. A no net loss and a net gain in area and ecosystem function in Bellingham Bay is anticipated;

2. Project proponents will focus on the Pilot habitat objectives and actions identified to achieve the protection and restoration of estuaries, restoration of eelgrass, the restoration of habitat connective corridors, and the maintenance of processes needed to sustain marine ecosystems;

3. Project proponents will be directed away from impacting critical resources and towards habitat opportunities that help achieve the habitat objectives of the Comprehensive Strategy; and

4. Regulatory agencies and the tribes will have flexibility to use this mitigation framework to provide incentives and disincentives to project proponents.

## MITIGATION SEQUENCING

This mitigation framework recognizes federal, state, tribal, and local laws and policies, concerning mitigation planning. It acknowledges that mitigation includes the following fundamental sequential elements:

1. Avoiding the impact altogether by not taking a certain action or parts of an action.

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking steps to reduce impacts.

3. Compensating for the impact by replacing, enhancing or providing substitute resources or environments.

Other forms of mitigation are identified below. These types of mitigation are typically achieved through implementation of Best Management Practices (BMPs) and permit conditions. They include:

- Repairing, rehabilitation, or restoring the affected environment.

- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of an action.

- Monitoring the impact and taking appropriate corrective actions.

Elements 1, 2, and 3 represent the desired sequence of steps in mitigation planning and are not unique to Bellingham Bay. Compensation occurs after an evaluation of project design and/or operation impacts have been avoided and minimized. Other forms of mitigation identified above occur only after through permit conditions. Many agencies recognize that strict sequencing is not always possible, and agencies have flexibility in how sequencing is applied to projects.

## COMPENSATORY MITIGATION

The overall goal of compensatory mitigation is to ensure that shoreline and in water developments within Bellingham Bay proceed in a manner that is consistent with the Comprehensive Strategy and compensate for identifiable, unavoidable impacts in manner that achieves a no net loss and net gain in area and ecosystem function.

Compensatory mitigation should be based on existing current resource conditions, sensitivity, and identified functions within Bellingham Bay at the time a project is proposed. Information on the existing habitat and current resource conditions and habitat restoration opportunities identified in the Data Compilation Report, Habitat Documentation Report, and Section 2 of the draft EIS should be used as an overlay onto a given development scenario to identify adverse impacts. Depending on the project site, additional site specific information may be required. Elements of a development scenario such as dredging and shoreline fills or over water structures, each of which can have specific types of impacts on resources, habitats, and physical processes, can be evaluated relative to known conditions and desired future habitat restoration outcomes. From this overlay, a project proponent can determine if:

1. there would be adverse impacts from the project;

2. whether the proposed project conflicts with the Comprehensive Strategy's desired habitat restoration outcomes;

3. it is necessary to reevaluate the proposed project to determine if there are ways to avoid and/or minimize impacts;

4. a habitat mitigation action could be incorporated into the project; and

5. whether the project could be located and planned to achieve the habitat objectives as identified by the Pilot Team.

In assessing adverse impacts to marine resources, functions, and physical process, a number of species, habitats, functions, and specific areas within Bellingham Bay receive priority consideration including:

- Target Species: salmonids, Dungeness crab, hardshell clams, surf smelt and sand lance, Pacific herring, flatfish, Ling cod, pandalid shrimp;
- Threatened and Endangered Species (including species such as Chinook salmon);
- Species protected under the Marine Mammal Protection Act (MMPA) such as harbor seals;
- Habitats or physical processes difficult to replace and that support salmonids during their transition from freshwater (i.e., eelgrass, sediment or gravel deposition, creek estuaries);
- Reproductive and rearing habitat (e.g., intertidal and shallow subtidal mudflat, high intertidal spawning beaches); and
- Habitats that provide multiple functions for a variety of species (e.g., areas that concentrate sensitive life history stages such as eelgrass beds).

Assuming that all steps have been taken to avoid and minimize the impacts from a proposed project through the application of the mitigation sequencing steps described above, a project proponent would consider the following types of mitigation actions:

Creation: The establishment of marine habitat area and function from an upland area where aquatic habitat did not exist.

Restoration: The act of establishing physical elements of the aquatic environment such as slope, tidal elevations, and substrate suitable for a desired habitat type. Restoration includes actions that modify existing aquatic habitat to increase area and function in the aquatic environment and in upland areas that were previously aquatic habitat.

Enhancement: Modifying a physical, chemical or biological characteristics of the aquatic environment to increase function to an existing aquatic habitat without changing characteristics such as slope and elevation.

Preservation: To acquire habitat areas for the purpose of permanent protection. This form of compensatory mitigation is typically used in conjunction with creation, restoration, or enhancement.

Marine mitigation banking is an acceptable mitigation practice within Bellingham Bay, and is one mechanism that could be used to achieve habitat objectives in the bay. Mitigation Banking is the creation, restoration, and enhancement, and in some circumstances the preservation of habitat undertaken by a project proponent to act as a bank of credits to compensate for habitat impacts from future development projects. Credits and debits are based on area or scientifically valid measures of habitat function and value acceptable to the mitigation banking review team. The use of credits from a mitigation bank as a form of compensation can occur after the standard sequencing of mitigation (i.e., avoidance, minimization, etc.) has occurred. Habitat units may be traded or sold.

The Comprehensive Strategy and draft EIS provide a landscape context within which to plan and establish a mitigation bank. A bank can be established by public and/or private parties for the purposes of providing compensatory mitigation for development related impacts within Bellingham Bay. A mitigation bank instrument such as a Memorandum of Agreement would need to be developed and approved by federal, state, and local-regulatory agencies, the Tribes, and land owner. (Note: Several federal agencies have already issued guidance on the establishment and use of mitigation banks and Ecology is currently developing rules to establish and approve mitigation banks, including banks in marine waters).

## COMPENSATORY MITIGATION REQUIREMENTS

Compensatory mitigation requirements for identifiable, unavoidable impacts take into account several elements including impact location, mitigation location, mitigation action, and mitigation timing all of which can influence the type and extent of mitigation that will be required.

In the absence of an agreed to functional equivalency model that can define the value "currency" of a particular habitat type, this framework starts with an assumption that the resource regulatory agencies reviewing a project site and mitigation will value a habitat the same. The Habitat Subcommittee recognizes the following in developing this mitigation framework:

1. Efforts by NMFS and other trustee agencies to develop a Habitat Equivalency Model (HEM) for Commencement Bay that would be used to determine the type and how much mitigation would be required for a given development action.

2. Another model or method may be developed as a tool to help regulators and the regulated community define mitigation requirements, and this other model or method may be developed outside of the Pilot Project.

Given the above information and in the absence of a functional equivalency model for Bellingham Bay, the Habitat Subcommittee had developed the following modifiers to use when determining the extent and type of compensatory mitigation required for a proposed development project. These modifiers address many of the elements that have been developed for the HEM including habitat type, timing of mitigation, the time necessary for a mitigation action to achieve function, and risk associated with the mitigation action. It also attempts to use the concept of net gain that would result in overall habitat gains in aggregate (i.e., within a sub area or the inner bay) over habitat gains on a project by project basis.

## MODIFIERS

### In-Kind and Out-of-Kind Habitat Replacement

In-kind habitat replacement is defined as providing the same functions as those that are impacted (e.g., estuary habitat for estuary habitat, spawning habitat for spawning habitat, eelgrass habitat for eelgrass habitat). Out-of-kind is defined as providing a different function within the same sub-area.

### On-Site and Off-Site Habitat Replacement

On-site is defined as providing habitat replacement within the same sub-area as where the impact occurs (e.g., surf smelt spawning habitat replacement within a sub-area where a project impacts surf smelt spawning habitat). Off-site habitat replacement is defined as replacing habitat functions in other sub-areas than where the impact occurs.

Off-site mitigation may occur outside of a sub-area in which the impact occurs but within Bellingham Bay based on the following limitations:

1. Project related impacts to documented herring spawning habitat will be mitigated in the same sub-area where impacts to herring spawning habitat occurs and within or adjacent to documented herring spawning habitat.

2. Project impacts to documented surf smelt spawning beaches will be mitigated in the same sub-area where impacts to surf smelt spawning habitat occurs and within or adjacent to documented surf smelt spawning habitat.

3. Project impacts to documented sand lance spawning beaches will be mitigated in the same sub-area where sand lance spawning habitat occurs and within or adjacent to documented surf smelt spawning habitat.

4. Project related impacts to creek estuaries will be mitigated within the same sub-area creek estuary occurs.

5. Nearshore (e.g., -10 ft MLLW shoreward) project related impacts that do not include documented herring, smelt, or sand lance spawning habitats, or creek estuaries may be mitigated in any sub-area with the exception of the Marine sub-area.

## Mitigation Timing

This mitigation framework encourages reducing the risk of temporal losses of marine habitats and resources through implementation of mitigation in advance of project implementation. Mitigation requirements for actions that can be implemented in advance of a project impact and is agreed to in advance by the regulatory agencies will be less stringent then mitigation requirements for actions that are implemented concurrent with or after project impacts.

## Mitigation Feasibility

Some types of habitat mitigation have a higher risk for achieving functional success than other habitat replacement actions. For example, in Washington it appears to be more difficult to replace large eelgrass beds greater than 0.25 acre in size than smaller eelgrass beds and to replace herring spawning habitats. Habitat replacement actions that target other types of functions have less risk of failure. For example, modifying beach elevations and substrates in intertidal elevations for epibenthic and benthic production has been successfully demonstrated in several areas in Puget Sound over the past 10 years.

## Mitigation Type

This modifier refers to whether the mitigation action creates, restores, enhances or preserves habitat (see description above).

## Habitat Incentives and Disincentives

This modifier refers to whether an impact or mitigation action impacts or provides, respectively, a habitat type and/or function in a location that achieves the protection and restoration of estuaries, the restoration of eelgrass, the restoration of habitat connective corridors.

## Net Gain

A mitigation action will be determined to have a achieved a net gain in habitat function if a mitigation action provides a habitat type and/or function in a location that achieves the protection and restoration of estuaries, the restoration of eelgrass, and/or the restoration of habitat connective corridors. Mitigation actions that do not achieve the above referenced habitat objectives will be subject to an additional habitat area and function requirement. Overall, the goal of net gain is targeted for the overall bay either in certain sub-areas or an aggregate of sub-areas.

# MITIGATION RATIOS

Ratios are typically used to determine how much additional mitigation area is required to compensate for lost area, function, and temporal losses, and potential risk from implementing a mitigation action. Ratios are essentially multipliers applied to the habitat area impacted and for Bellingham Bay are subject to the modifiers defined above. Currently, details of the mitigation framework and ratios are being developed for each modifier for application to the Integrated Near-Term Remedial Action Alternatives.

# MITIGATION MONITORING

Monitoring of a mitigation action will typically be for a period of three to five years or until the performance criteria for the compensatory action have been met. Monitoring of an appropriate control site may also be necessary to account for natural variations or changes in habitat of habitat functions.

Attributes that will need to be monitored to determine the success of mitigation action will depend on the habitat type and functions for which the compensatory action has been required. Examples of attributes that may need to be monitored are identified below. Other attributes may also need to be monitored and will be specific to the mitigation action. Some habitat attributes (epibenthic invertebrate production) may be determined to be successful based on monitoring and study documentation from mitigation projects with similar habitat characteristics.

| Habitat Attribute | General Monitoring Method |
|---|---|
| Surf smelt/sand lance spawning habitat | Substrate composition; presence/absence of eggs; tidal elevation |
| Juvenile salmonids | Epibenthos; presence of fish |
| Eelgrass | Area; density |
| Macroalgae | Area; percent cover; density |
| Mudflat/sandflat | Area; tidal elevation; substrate composition |
| Hardshell clam | Elevation; substrate type; clam density; species composition |
| Herring spawn | Presence/absence of herring spawn |
| Dungeness crab | Presence; density; seasonal utilization |
| Epibenthos | Elevation; substrate type; species/density |
| Benthos | Elevation; density; species |
| Waterfowl/marine mammals | Habitat use; species counts; seasonal utilization |

## MITIGATION ADAPTIVE MANAGEMENT AND CONTINGENCIES

With many mitigation projects, all contingencies cannot be anticipated. An adaptive management and contingency plan that is flexible enough so that modifications can be made if portions of the mitigation design to do not produce the desired results will need to be developed. The attached figures are examples of an adaptive management matrix and contingency planing process that could be adapted for mitigation projects.

## MITIGATION PLAN CONTENT

Mitigation plans will need to include the following elements:

- Statement of Impacts and Mitigation Need
- Mitigation Goals and Objectives
- Mitigation Evaluation Performance Standards
- Mitigation Design and Schedule
- Mitigation Monitoring Plan and Schedule
- Mitigation Maintenance Plan
- Adaptive Management and Contingency Plan

## Special Note:

It should be noted that although the Tribes have helped develop this framework and agree to its application for habitat impacts, the Tribes may require additional mitigation or agreements with developers for other issues such as treaty access.

WAC 332-30-107 (5) provides an opportunity for DNR (for lands not covered under PMAs) to supplement the SMP planning process with management plans to meet the responsibilities for state-owned aquatic lands. Plans developed and implemented will involve aquatic lands, resources, and activities requiring intensive management, special protection, or conflict resolution and will be developed when these needs are not provided for in the SMP. WAC 332-30-107 (6) indicates that the SMP and additional planning processes described in subsection (5) are the preferred means for identifying and mitigating adverse impacts on resources and uses of state-wide value. In the absence of such planning directed at these values and uses, DNR (for aquatic lands not covered under PMAs) will mitigate unacceptable adverse impacts on a case-by-case basis by the following methods:

- Avoidance
- Look at alternatives that result in insignificant adverse impacts
- Replace, preferably on-site, impacted resources and uses
- Payment of loss value

# Appendix E
# Excerpts from ongoing New Whatcom Master Planning Process

# INTERLOCAL AGREEMENT
# REGARDING THE
# "NEW WHATCOM SPECIAL DEVELOPMENT AREA"

**THIS INTERLOCAL AGREEMENT** (the "Agreement") is made and entered into by and between the Port of Bellingham ("Port") and the City of Bellingham ("City") pursuant to Chapter 39.34 RCW to address in a comprehensive manner issues necessary for the successful redevelopment of the Bellingham waterfront.

## ARTICLE I
## RECITALS

**WHEREAS**, the Port and the City have, by a previous interlocal agreement, jointly established and funded the Waterfront Futures Group ("WFG"). This citizen advisory panel was tasked to develop and make recommendations on issues regarding future development of Bellingham's waterfront and to report its recommendations to both the Port and the City: and,

**WHEREAS**, following an extensive public process, the WFG completed its recommendations for Bellingham's waterfront which was delivered in draft form to the Port and City on June 24, 2004; and

**WHEREAS**, the Port and the City have entered into a comprehensive interlocal agreement entitled "Interlocal Agreement for the Implementation of the Waterfront Futures Group Recommendations" for cooperation in the future development of Bellingham's waterfront. That interlocal agreement contemplated that the Port and the City would enter into separate interlocal agreements to specifically address the redevelopment of certain areas of the Bellingham waterfront: and,

**WHEREAS**, for the past ninety years, the Port has operated a deep water break bulk shipping terminal on the downtown waterfront to support industrial activity in Bellingham and Whatcom County. The use of the shipping terminal is now limited due to the decline of industrial activity that requires break bulk shipping; and

**WHEREAS**, Georgia-Pacific Corporation (Georgia-Pacific) has operated an industrial facility on the downtown waterfront consisting of a pulp mill, a tissue mill, a waste water treatment facility and a large warehouse. Georgia-Pacific closed its pulp mill operation in 2001 and has indicated that it will be closing its tissue mill operation in the foreseeable



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future. Therefore, the large GP industrial site is currently underutilized and will be abandoned for industrial use in the foreseeable future; and

**WHEREAS**, Georgia-Pacific has offered its waterfront industrial real property for sale as part of the closing of its industrial operations on the property. This property, and the adjacent Whatcom Waterway, will require significant environmental remediation above industrial use standards for redevelopment; and

**WHEREAS,** the WFG found that this key piece of waterfront property should be acquired and held in public ownership as its reuse is planned and as it is redeveloped over time. The Port and the City have designated the central waterfront industrial property as the "New Whatcom Special Development Area", hereinafter referred to as "New Whatcom SDA". A map of the New Whatcom Special Development Area is attached hereto as Exhibit "A"; and

**WHEREAS**, the Port has entered into a preliminary agreement with Georgia-Pacific to acquire all of its Whatcom County property, including the waterfront industrial property. The agreement contemplates that the Port will take responsibility for the environmental remediation of certain known environmental conditions on the Georgia-Pacific property and in the Whatcom Waterway in exchange for transferring the property to the Port; and

**WHEREAS**, the Port intends to purchase insurance coverage to pre-fund its anticipated environmental remediation costs; and

**WHEREAS**, the acquisition of the Georgia-Pacific property and environmental remediation to a standard suitable for redevelopment by the Port can only be accomplished if the Port can form strategic partnerships with key government agencies, such as the City, to assist in the redevelopment of the New Whatcom SDA; and

**WHEREAS**, in response, the City and Port have agreed to form a strategic partnership to redevelop the New Whatcom SDA in the form of (i) direct and early investment in , infrastructure, public access, public open space and marine infrastructure, (ii) participation in the pursuit and receipt of grants and other forms of aid for the redevelopment of the site, and (iii) development of a consolidated public process for permitting mixed-use development of the site (iv) development of environmental protection standards that will insure that development is compatible with and forms a part of the environmental remediation, (v) consolidation of existing parcels and rights of way to accommodate redevelopment and (v) adaptive reuse of historic buildings; and

**WHEREAS**, the City and the Port recognize the unique and historic opportunity for the citizens of Bellingham, Whatcom County, and the greater Puget Sound region to provide for the redevelopment of the site as a mixed-use development with significant public access



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opportunities, all of which will require a higher clean up standard and corresponding cost; and

**WHEREAS**, the Port and the City have recognized and agreed upon a model for the redevelopment of the New Whatcom SDA. The Port will assume the costs and risks associated with (i) Georgia-Pacific's responsibilities for the environmental remediation of the Georgia-Pacific property and the Whatcom Waterway, (ii) the environmental remediation to a higher standard suitable for redevelopment and (iii) the development of all marine infrastructure. In addition, the Port will provide to the City such property as may be necessary for the development of infrastructure, public access, parks, and open space within the New Whatcom SDA; and

**WHEREAS**, the City will assume the costs and risks associated with the development of the land side infrastructure and public open space necessary for the redevelopment of the New Whatcom Site consistent with the Environmental Protection Standards ("EPS"), defined below, excluding the environmental remediation risks undertaken by the Port; and

**WHEREAS**, the Port's ability to assume Georgia-Pacific's environmental liabilities, to fund a higher standard of remediation, to provide the marine infrastructure and to provide the property to the City for infrastructure, public access, parks, and open space will be derived from grants and the sale of the development ready parcels to private developers or public entities. The City's ability to fund the public infrastructure, parks and open space will be derived from existing capital funds, grants, bond financing and levies; and

**WHEREAS**, the City and the Port agree to make the foregoing commitments to each other and the community. The Port and the City understand and agree that without these commitments, understandings, and investments by the City and the Port it will not be possible to successfully redevelop the New Whatcom SDA as a mixed-use development requiring compliance with a higher regulatory environmental clean up standard; and

**WHEREAS**, the City and the Port are currently in the process of acquiring property between D Street and the Whatcom Waterway for incorporation in the waterfront redevelopment. In addition, both the City and the Port are potentially liable parties (PLPs) for properties, other than the Georgia-Pacific property, located within the New Whatcom SDA. The Port and the City will work cooperatively to develop separate PLP agreements to resolve the environmental issues involving these New Whatcom SDA liabilities; and

**WHEREAS**, in order to create an environment that enhances the opportunity for early inbound private investment into the site, the Port and the City have both determined that (i) public access and (ii) new landside and marine infrastructure, including streets, utilities, bulkheads and visitor moorage will have to be built on the Georgia-Pacific and Central Waterfront properties to accommodate redevelopment. Innovative and consolidated planning



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and permitting processes will be needed to attract and foster redevelopment interests and carry out the adopted recommendations of the WFG; and

**WHEREAS**, the Port and the City recognize that successful and timely redevelopment of the property encompassed in the New Whatcom SDA benefits the economic and social welfare of Bellingham and Whatcom County, and represents an historic opportunity for the citizens of Bellingham and Whatcom County to shape the Bellingham waterfront for the next century.

**NOW, THEREFORE**, in consideration of the mutual covenants and conditions contained herein, the Port and the City agree as follows:

## ARTICLE II
## PURPOSE, NEED, AND MANAGEMENT OF THE NEW WHATCOM SDA

1. **New Whatcom SDA**. The Master Interlocal Agreement for the Implementation of the Waterfront Futures Group Recommendations provides that the Port and the City can create development areas of special interest for those areas directly owned in whole or part by either entity. The Port and the City hereby create the New Whatcom SDA as depicted in Exhibit A and subject to the understandings contained in this Agreement. "New Whatcom" is a provisional name pending the branding of the site as provided herein.

2. **Planning Neighborhood and Development Area**. The New Whatcom SDA shall be considered a new and unique development area for the purposes of planning, administration and development.

3. **Project Cooperation and Joint Funding**. Both City and the Port agree that this area is critical to Bellingham's future and that joint cooperation and funding is required as herein specified.

4. **Staffing**. The Port and the City anticipate using existing staff, augmented by outside consultants, to accomplish the purposes of this Agreement. To the extent necessary, the Port and the City will commit staff and financial resources as necessary to accomplish the purposes of this Agreement.

5. **Outside Funding Assistance**. The Port and the City will jointly prioritize and pursue outside funding assistance from federal and state sources to further the goals of this Agreement and allocate resources to secure said funding. For the year 2005, the parties shall each commit a minimum of $125,000 for a total of $250,000, for the promotion and acquisition of grants for projects located in the New Whatcom SDA. The parties shall jointly select a consultant and direct its effort through their respective designated representatives.



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The Port shall provide the required contract supervision and management. The City shall pay to the Port within 30 days of delivery of an invoice from the consultant, the City's 50% share of the invoice received from the Consultant. Neither parties' share shall exceed the $125,000.00 commitment above without further approval of the entity.

6. **Name Branding of the SDA.** The Port and the City recognize the challenges in attracting inbound private capital to the New Whatcom SDA and will jointly fund and develop a marketing strategy for the area that includes naming and "branding" for purposes of accelerating the absorption rate of the property available for private development. For the year 2005, the parties shall each commit a minimum of $30,000 for a total of $60,000 . The parties shall jointly select a consultant and direct this effort through their respective designated representatives. The Port shall provide the required contract supervision and management. The City shall pay to the Port within 30 days of delivery of an invoice from the consultant, the City's 50% share of the invoice received from the Consultant. Neither parties share shall exceed the $30,000.00 commitment above without further approval of the entity.

7. **Cooperation with Regulatory Agencies.** The Port and the City will cooperate and support one another's efforts with regulatory agencies to accommodate the redevelopment efforts consistent with the NWDP.

8. **Development Predictability.** The Port and the City will explore options to create development predictability and incentives to further attract private investment within the New Whatcom SDA.

## ARTICLE III
## NEW WHATCOM SDA DEVELOPMENT PLAN, DEVELOPMENT STANDARDS AND ENVIRONMENTAL PROTECTION STANDARDS CREATION, ADOPTION AND CONSISTENCY

9. **New Whatcom SDA Development Plan.** The Port and the City will jointly develop and fund, a New Whatcom Development Plan ("NWDP") together with the necessary State Environmental Policy Act ("SEPA") documents.

   a. The City and the Port shall each commit for the year 2005 a minimum of $125,000 for a total of $250,000 to the development of the NWDP. Using these funds, the parties shall jointly select and hire a consultant to assist and facilitate the development of the NWDP. The parties shall jointly direct the consultant through their respective designated representatives. The Port shall provide the required contract supervision and management. The City shall pay to the Port within 30 days of delivery of an invoice from the consultant, the City's 50% share of the invoice received from the Consultant. Neither parties' share shall exceed the $125,000.00 commitment above without further approval of the entity. Expected expenses include



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the cost of a project manager, consultant time and the cost of materials for presentation and documentation..

b. The City and the Port, will seek input and comment from the newly formed Waterfront Advisory Group ("WAG") while preparing the NWDP.

c. The NWDP will also include a detailed capital facilities budget and an anticipated implementation schedule for items i (i) - (vi), below.

d. The City and the Port agree that development of any of the sites created within the SDA shall not require a developer (public or private) to install or pay for any parks and open space, provided however, that nothing shall prevent a developer from electing to install such improvements on their own site.

e. The City shall develop, at its cost, all parking for City-owned infrastructure, such as parks, open space, and public waterfront access.

f. For all other parking, a developer shall choose to either provide its required parking or lease the parking from the City. The City shall be entitled to market based rent for the use of this parking. Nothing herein shall prevent the City from contracting with the Port or a private entity to provide this parking. The City shall not be required to build parking structure(s) to meet developers' parking requirements until bond financing can be obtained or a contractual agreement is reached to provide this parking. However, the City will not require a developer to construct on-site parking facilities to meet their parking requirements as part of a development, so long as the developer has agreed to lease City-provided parking as described above. In the interim, the City will provide temporary parking at market rates.

g. All parks, infrastructure, public open space and parking to be constructed by the City shall be identified in the New Whatcom Development Plan (NWDP).

h. The City and the Port further agree that the NWDP shall be consistent with and harmonious with the Port's remediation plans approved by the Washington State Department of Ecology. Unless agreed to in the NWDP, the City will not impose any additional environmental mitigation or environmental remediation requirements for the development in the SDA.

i. The NWDP will identify and locate, at a minimum the following:

i. specific land uses and building sites,
ii. public parks, open space, and public access opportunities,

iii. public marine and visitor moorage facilities,



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iv. marine habitat enhancements,

v. historic resources; and

vi. on and off site infrastructure necessary for development including but not limited to traditional utilities (sanitary sewer, water, gas, electrical, etc.), roads and walkways, telecommunications, storm water treatment, and area wide parking facilities.

j. The Port is responsible for the environmental remediation of certain known environmental conditions on the Port owned property and the Whatcom Waterway, except for the City's compliance with the environmental protection standards in the course of City projects.

10. **Timeline for Adoption of NWDP**. It is anticipated that the NWDP and the necessary SEPA reviews (completion of a Final Environmental Impact Statement) will be complete no later than December 31, 2005. The parties will work cooperatively during the development of the NWDP to make sure that the NWDP and the parties' existing planning documents, such as the City's Shoreline Master Plan, are consistent. If there are inconsistencies, the parties will initiate the necessary changes to make them consistent. Thereafter, the NWDP and associated SEPA documents will be presented to the Port commission and City Council for consideration during December of 2005. Once adopted by the governing bodies of both the Port and the City, the NWDP shall be appended to this Agreement as Appendix "1.

11. **Land Use Plans and Comprehensive Scheme.** It is the intent of the Port and the City that the NWDP will be the final land use and shoreline development agreement for the development of the New Whatcom SDA. Therefore, the Parties will initiate and make good faith efforts to complete in 2005, or as soon thereafter as possible, approval of the necessary changes to the existing regulations and plans to implement the NWDP. The parties recognize this is subject to the legislative process and this function can not be surrendered by this Agreement. By way of example, the Port shall promptly amend its Comprehensive Scheme of Harbor Improvements and the City will promptly undertake to amend the City Comprehensive Plan, the City Neighborhood Plan, the City Zoning Code and the City Shoreline Master Program (SMP). The parties will begin the process of adopting these changes to their respective legislative bodies as soon as practical. Any shoreline development permit shall be consistent with the adoption and approval of the NWDP. Once approved it is understood that subsequent land divisions may require subdivision approvals, such as binding site plans, condominiums, lot line adjustments, or other divisions allowed by RCW 58.17. Such approvals shall be consistent with this Agreement and the NWDP.



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12. **Development Agreement**. The approved NWDP shall be a "Development Agreement" as the term is defined in the RCW 36.70B and a binding contract between the City and the Port.

13. **Development Standards**. As the NWDP is being jointly developed, the City and the Port will coordinate any required plans and specific regulations to facilitate redevelopment within the New Whatcom SDA. The development standards will recognize the need to foster mixed development consistent with an urban downtown environment, emphasizing reduced, limited or eliminated setbacks, providing for building heights in excess of three stories where appropriate, defining landscape features and historic building considerations, and providing for area wide joint parking facilities constructed by the City (or an entity designated by the City for this purpose) as part of the City's infrastructure requirements as specified in section 9(e) and (f) above. The Port and the City agree that there shall be no park or open space requirements imposed upon any lot or development. The development regulations and standards will be included in the NWDP and shall thereafter be attached hereto as Appendix "2".

14. **Environmental Protection Standards**. All development activities, whether private or public, within the New Whatcom SDA will be required to comply with the environmental protection standards ("EPS") that are developed by the Port in consultation with the City and approved by the Department of Ecology as part of the remediation requirements. To this end, the EPS are conceived to attempt to assure that all development is undertaken properly with the same goals and requirements and in a manner consistent with all environmental remediation requirements. In addition, it is anticipated that the development itself will be part of the environmental remediation. The EPS shall thereafter be attached hereto as Appendix "3".

15. **Status Quo Until Agreement**. Until the parties reach agreement on the NWDP as a Development Agreement and adopt the appropriate changes to the plans and regulations noted above or for a period of twenty (20) years which ever is shorter the following conditions shall apply to Port owned property within the New Whatcom SDA:

   **a.** Except as requested by the Port, or as required by law, the City shall not initiate, consider or adopt a change to the existing allowed uses and related development standards as set forth in the existing zoning, shoreline regulations and related planning documents. It is the intent of the Parties that the use allowed within the SDA continue as heavy impact industrial uses without any new restrictions or regulations until such time as the NWDP as a Development Agreement and related changes to plans and regulations are adopted or the expiration of the twenty (20) years noted above, whichever is sooner.



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b. At the Port's reasonable request, the City shall not unreasonably refuse to terminate, remove or alter any easement, reserved easement, right of way or reversionary right of way within the SDA.

c. The City shall not impose or charge a fee for or require any buffer, open space or parks for heavy impact industrial uses of the SDA.

d. The Parties agree that the Port shall be the SEPA lead agency for any development in the SDA, except for any City projects.

16. **Challenge to the Status Quo Agreement**. The Port and the City agree that the twenty (20) year term contained in paragraph 15 is reasonable and necessary to allow the Port to recover the public investment in the SDA. However, the Port and the City agree that a Court of competent jurisdiction may modify the twenty year (20) term or any condition of the status quo agreement reflected in paragraph 15 above to the extent necessary to preserve legality of the status quo agreement.

## ARTICLE IV
## NEW WHATCOM SDA
## PERMITTING PROCESS

17. **Building Permit Predictability**. The Port and the City recognize that consistent and predictable interpretations of the applicable building and development regulations, and an expedited process (beyond the normal City process) for necessary land development approvals is critical to creating an atmosphere favorable to obtaining inbound private investments in the New Whatcom SDA and for the public entities to obtain a reasonable and timely return on their investments in the New Whatcom SDA. The Port and the City will work cooperatively to implement processes to ensure building permit predictability, consistency, and expediency by the end of 2005. If, after adoption, the Port or the City believes that such processes are not providing the necessary predictability, consistency, and expediency for success of the redevelopment of the site, then the parties shall meet and may adopt new and alternate processes to achieve the necessary predictability, consistency, and expediency.

## ARTICLE V
## EARLY ACTIONS BY THE PORT AND THE CITY

18. **Development Phasing**. The New Whatcom SDA is expected to be redeveloped in phases, due to its size and the development absorption rate. In doing so, public investments can be better managed and phased consistent with redevelopment. The parties intend for redevelopment to commence within the property formerly referred to as the Central Waterfront area with the balance of the property being developed inland outward. In the interim and after the approval of the NWDP, properties will be used for existing land uses



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such as light and marine industrial uses especially within existing industrial buildings consistent with the approved phasing plan. Phasing in this manner will avoid development gaps or voids of services and infrastructure. The expected phasing of the marine infrastructure, landside infrastructure, visitor moorage, parks, parking, open space and areas available for development will be included in the NWDP.

19. **Early Action Projects.** The Port and the City recognize the need to show early and continued progress towards achieving the goals of this Agreement. This is necessary to create project momentum, build predictability, create synergy in the redevelopment of the site, and enhance public awareness, understanding, confidence and support for the public and private investment to redevelop the site. The Early Action projects will include early environmental remediation projects, early infrastructure design and development, and the preliminary selection of sites for sale to public or private entities, institutions and/or developers. To this end, the parties agree to attempt to identify early action projects as part of the NWDP, or as a separate Early Action project agreement. Early Action Projects shall not be subject to section 18 above, unless identified and included in the NWDP.

20. **Approvals of Early Environmental Remediation Actions.** The Port and the City recognize that early environmental remedial actions will require the approval of state and federal agencies. In this regard, the Port will work diligently with the state and federal agencies with jurisdiction to accomplish this task

## ARTICLE VI
## PORT AND CITY RESPONSIBILITIES FOR NEW WHATCOM SDA

21. **Landside Infrastructure Parks and Public Access Development.** The City agrees to design, construct, and maintain at its cost landside public infrastructure as set forth in the NWDP. For the purposes of this Agreement and the NWDP, landside public infrastructure means and includes the following:

- **a.** streets, curbs, gutters, sidewalks, lighting and traffic controls
- **b.** water and sewer,
- **c.** storm water treatment and conveyance facilities,
- **d.** area wide parking as described in section 9(e) above,
- **e.** public parks, open space, and public access

The above various elements of public infrastructure will be outlined and the construction schedule set forth in the jointly adopted Capital Facilities and Infrastructure Plan included as part of the NWDP.

22. **Marine Infrastructure and Moorage Facilities.** The Port will be responsible for design, financing, maintaining, permitting, developing, and operating public marine infrastructure, marinas and visitor moorage facilities as specified in the NWDP.



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a. **New Marina**. It is anticipated that these facilities will include a new downtown marina within the existing ASB treatment lagoon. The Port will design the facility to maximize connectivity to the Downtown and Old Town commercial areas.

b. **Visitor Moorage**. It is anticipated that the marine facilities will also include visitor moorage both within the ASB and adjacent to the Whatcom Waterway along the existing Georgia-Pacific piers.

c. **New boat launch**. Facilities may also include a new public boat launch facility. If so provided, the City agrees that the public boat launch located at Squalicum Harbor may be reduced in size or permanently eliminated at the discretion of the Port upon the installation and opening of a new public boat launch located within the New Whatcom SDA. The City and the Port will execute any necessary documents or agreements to relieve the obligation to maintaining the existing Squalicum Harbor Boat launch.

d. **Bulkhead repair and replacement**. It is anticipated that certain publicly owned bulkheads within the New Whatcom SDA may require repair and/or replacement. The Port will undertake the repair and/or replacement of such publicly owned bulkheads as it determines to be necessary for their intended purposes as set forth in the NWDP. The City agrees to process and issue the related and necessary permits for such repairs as expeditiously as possible consistent with legal requirements, other provisions of this Agreement, and other related Interlocal Agreements between the Port and the City.

This marine infrastructure will be constructed as set forth in the jointly adopted Capital Facilities and Infrastructure Plan included as part of the NWDP.

23. **Real Property Title Issues.** The New Whatcom SDA is currently encumbered by historical reservation of easements and reversionary interests within vacated rights of ways in favor of the City. These historical interests are in many cases obstacles to rational redevelopment of New Whatcom.. The Port and the City will identify these historical interests in the NWDP. To facilitate redevelopment these historical interests will be removed at no cost to the Port. The Port and the City recognize the goal of relieving the SDA of reserved easements, rights of ways, and similar encumbrances and other requirements to allow the implementation of the NWDP and the creation of new rights of ways, and/or easements for utilities, and transportation corridors.

24. **New City Property Rights**. During redevelopment, the City will be conveyed the appropriate property rights, which may include the fee simple interest, for the property containing public infrastructure and public parks and access areas as set forth in the NWDP. Except for property necessary for parking facilities specified in section 9(f) above, the Port



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will provide and convey these property rights to the City at no cost following construction of these public facilities including public infrastructure by the City as specified herein and consistent with the NWDP. The cost of the property, if any, for the parking facilities specified in section 9(f) above will be determined in the NWDP taking into account revenue streams from parking users. All such public improvements, including infrastructure, public parks, open space, capital facilities, and public access improvements shall be completed in a manner consistent with the environmental development standards set forth in this Agreement. To the extent allowed by law, the Port will indemnify the City and the Port will be solely responsible (as between the City and the Port only) for any environmental liability relating to historical environmental conditions on these properties; however, the City must comply with the EPS at its cost. This indemnification shall not be transferable or assignable by the City, except to any entity created by the City for the purpose of developing the New Whatcom SDA.

25. **Impact or Latecomers Fees**. The parties find that the redevelopment of this site is in the community's best interest and provides a broad general public purpose. To stimulate private investment in the site and to promote redevelopment necessary to achieving the public benefit and purpose of the redevelopment of the site, reduction of the impact and latecomers fees within the SDA is appropriate, to the extent allowed by law. The Parties also acknowledge that the City cannot control the latecomer and impact fees legally assessed by other individuals or entities within the site. The Parties shall cooperate in approaching other governments to similarly agree to adjusting impact fees. Accordingly, to the extent permitted by law, the City will not assess impact or latecomers fees for:

**a.** municipal infrastructure that the City installs within the site for the general public benefit, as determined by the City. The general benefit public infrastructure shall be identified in the New Whatcom SDA Development Plan; and

**b.** municipal infrastructure that is paid for with state or federal grant money to the extent of the grant funding; and

**c.** properties developed by the Port for Port operations (i.e. the marina and related upland areas, port offices, etc.); and

**d.** Specific areas identified in the NWDP for early development and the attraction of private inbound investment to encourage the successful redevelopment of the SDA thereby providing increased assessed valuations. In addition, the Parties may agree on specific areas for reduced and/or scaled latecomer and/or impact fee.

26. **Groundwater**. The proper management of ground and surface water is an important environmental component of the initial construction phases of the environmental remediation and redevelopment of the New Whatcom SDA. Accordingly, during the initial construction phases of the environmental remediation and redevelopment, the City will accept ground or

surface water into its sewer system subject, to the extent allowed by law and subject to the following conditions:

**a.** The City, in its determination, which shall not be unreasonably withheld, may take such ground and surface water as is acceptable and authorized under the City's applicable permits, including its NPDES permit, and at such levels as is within the system's capacity.

**b.** In compliance with law, the Port is responsible for obtaining approval from the Department of Ecology and any other pertinent state and/or federal agencies for the acceptance of said water into the City's sewer system if such approval is required.

**c.** In the NWDP, the Port and the City will agree to a rate reflecting the actual incremental costs of such treatment, to the extent allowed by law.

**d.** The Port will, to the extent permitted by law, indemnify the City and hold it harmless against any claims or suits arising from the City accepting the ground and surface water under this provision, unless and to the extent the claim or suit arises from the City's negligence.

**e.** The acceptance of the ground or surface water into the City's sewer system is for initial construction and clean up phases. All connections shall be considered temporary

**27.** **Payment In Lieu of Taxes by an Entity Not Subject to Property Taxes.** If a non property tax paying entity seeks to acquire any property within the NWDP area, the Port shall prior to selling the property negotiate either a capital infrastructure contribution or a payment in lieu of taxes that will reasonably compensate the City for the anticipated lost future property tax revenue for the property being transferred to the non property tax paying entity. The NWDP shall include a process and/or methodology for determining the capital infrastructure contribution or the payment in lieu of taxes that will reasonably compensate the City for the anticipated lost tax revenue.

## ARTICLE VII
## MISCELLANEOUS TERMS

**28.** **Reliance on Mutual Commitments.** The Port and the City acknowledge that their mutual commitments herein are fundamentally necessary to each party proceeding with its commitments herein. The parties recognize and acknowledge that their commitments and agreements to undertake certain actions herein are necessary and critical to the successful redevelopment of the site and are fundamental to the strategic partnership for the



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redevelopment of the site. Each party is relying on the timely and full performance of the other in the performance of their obligations undertaken herein.

29. **Georgia Pacific Purchase and Sale Agreement**. If the Port, for any reason, fails to conclude a transaction with Georgia-Pacific for the acquisition of the Georgia-Pacific property, this Agreement shall have no force or effect and shall be deemed null and void. In this regard, the City is undertaking its commitments herein with the knowledge that both parties' obligations herein are contingent upon the Port in its own and sole discretion deciding to proceed with the acquisition of the Georgia-Pacific property.

30. **Administration of this Agreement**. This Agreement shall be jointly administered by the City acting through the Mayor or the Mayor's designee and the Port acting through the Executive Director or the Executive Director's designee. In this regard and with the prior written approval of the other party, either the City or the Port may act as the lead party for contracts entered into in furtherance of this Agreement.

31. **Joint Funding**. In those instances where the Port or the City will contract for services provided in furtherance of this Agreement and the Port and the City have agreed to share the expense, the Port and the City shall set forth their respective financial obligations in writing prior to executing the contract.

32. **Document Reviews**. The Parties shall further cooperate by sharing all relevant information, including environmental documents, to the extent allowed by law.

33. **Term of Agreement**. Except as may be otherwise stated herein, the term of this Agreement shall commence on January 1, 2005, and shall continue in effect until December 31, 2025.

34. **Amendment**. Representatives of the City and the Port will meet from time to time to recommend amendments to this Agreement or the accompanying appendices. The Port and the City recognize that such proposed amendments shall be reduced to writing and taken before the Port Commission or City Council for approval.

35. **Captions**. The captions of this Agreement are for convenience and reference only and in no way define, limit or describe the scope or intent of this Agreement.

36. **Severability**. In the case of a determination of invalidity of one or more provisions, City and Port representatives will meet and work to resolve the issue to accomplish the purpose of this Agreement.

37. **Additional Acts**. The Port and the City recognize and expect that additional acts will be required to achieve the intent of this Agreement. Therefore, to the extent authorized by



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law, the Port and the City commit to take whatever additional acts that may be reasonably required to achieve the purposes of this Agreement.

38. **Neutral Authorship**. Each provision of this Agreement has been reviewed and negotiated, and represents the combined work product of the Port and the City. No presumption or other rules of construction that would interpret the provisions of this Agreement in favor of or against the Port or the City shall be applicable in connection with the construction or interpretation of any of the provisions of this Agreement.

**ADOPTED** by each government noted below in an open public meeting on the date noted.

**THE PORT OF BELLINGHAM**

By: Scott R. Walker

Commission President

Dated: 12/14/04

**DATED** this 4th day of Jan, ~~2004~~ 2005, for the **CITY OF BELLINGHAM.**

Mark Asmundson

*Mayor*

**Departmental Approval:**

Richard E. McKinley

*Department Head*

**Attest:**

Therese Holm

*Finance Director*

**Approved as to Form:**

Joan Hoisington

*Office of the City Attorney*



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## EXHIBIT LIST

| | | |
|---|---|---|
| EXHIBIT "A" | MAP DEPICTING NEW WHATCOM SDA | TO BE ADDED PRIOR TO EXECUTION |

## APPENDIX LIST

| | | |
|---|---|---|
| APPENDIX 1 | NEW WHATCOM DEVELOPMENT PLAN | UPON ADOPTION BY CITY AND PORT – EXPECTED BY DECEMBER 31, 2005 |
| APPENDIX 2 | DEVELOPMENT STANDARDS | UPON ADOPTION BY CITY AND PORT – EXPECTED BY DECEMBER 31, 2005 |
| APPENDIX 3 | ENVIRONMENTAL PROTECTION STANDARDS | UPON APPROVAL BY STATE AGENCIES |

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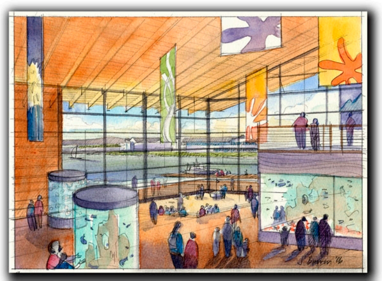
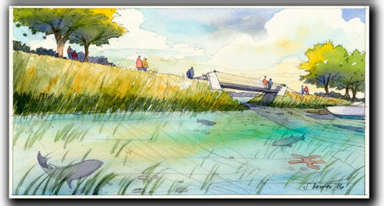


## 1
**TerrAquarium**

## 2
**Working Waterfront**



## 3
**Creating Marine Habitat**

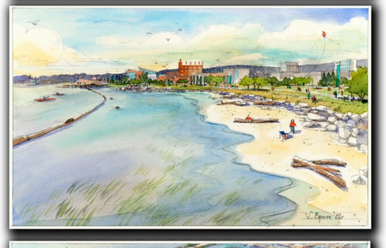
## 4
**New Bayside Harbor**

## 5
**Waterfront Promenade Visitor Moorage**

## 6
**Western Washington University**

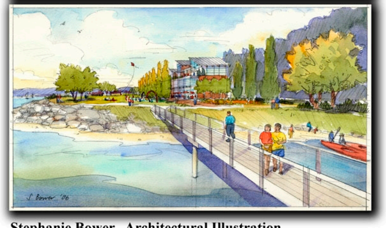
## 7
**Living on the Waterfront**

## 8
**Connections to Downtown**



## 9
**New Beaches**

## 10
**Deepwater Port**



## 11
**Waterfront Trail Connections**

Stephanie Bower, Architectural Illustration


9/26/06

# New Whatcom Draft Framework Plan 2026

BELLINGHAM CENTRAL WATERFRONT

PORT & CITY OF BELLINGHAM

PORT OF BELLINGHAM *Washington State*

CITY OF BELLINGHAM WASHINGTON

Christensen
DESIGN MANAGEMENT
CDM

# Appendix F
# Port Resolution 1230

RESOLUTION NO. 1230

**A RESOLUTION OF THE COMMISSION OF THE PORT OF BELLINGHAM, REQUESTING THE WASHINGTON STATE CONGRESSIONAL DELEGATION INTRODUCE LANGUAGE IN APPROPRIATE FEDERAL LEGISLATION ADJUSTING THE BOUNDARIES OF THE WHATCOM WATERWAY FEDERAL CHANNEL SO THAT IT IS PRESERVED IN THE OUTER PORTION OF THE WATERWAY, INCLUDING THE BELLINGHAM SHIPPING TERMINAL, AND DE-AUTHORIZED IN THE INNER PORTION OF THE WATERWAY IN SUPPORT OF THE COMMUNITY'S WATERFRONT REVITALIZATION EFFORTS.**

**WHEREAS**, the navigation improvements in Bellingham Bay include both locally-managed improvements created by the Port and other local interests, and federally-managed improvements including federal navigation channels; and

**WHEREAS**, federal navigation channels are established and modified through federal legislation, which defines the length, width and depth of the federal channel, within a waterway, the federal and local sponsors of the channel, and their respective roles in maintaining the channel depth; and

**WHEREAS**, the Whatcom Waterway is one of three federal navigation channels established on Bellingham Bay to support historically prevalent industrial land uses that were consistent with the federal channel program; and

**WHEREAS**, the federal channel within the Whatcom Waterway was originally established in 1910 with controlling depths of 26 feet below Mean Lower Low Water ("MLLW") in the outer portion of the channel, and controlling depths of 18 feet below MLLW in the portion of the channel, with the U.S. Army Corps of Engineers ("Corps") as the federal sponsor and the Port of Bellingham ("Port") as the local sponsor; and

**WHEREAS**, the boundaries of the federal channel within the Whatcom Waterway were subsequently adjusted in 1958 to increase project depths to 30 feet below MLLW adjacent to the Bellingham Shipping Terminal and outward into Bellingham Bay (the "Outer Waterway") and portions of the channel from the Bellingham Shipping Terminal inward to the Roeder Avenue Bridge (the "Inner Waterway"); and

**WHEREAS**, during historic periods of industrial use the federal sponsor has periodically dredged portions of the federal channel, subject to demonstration of a valid federal navigation interest, federal funds availability, project permitting constraints, the participation of the local sponsor and maintenance of berth areas and navigation improvements along the channel by local interests; and

**WHEREAS**, the federal channel in the Outer Waterway area has been maintained over the past 85 years through various dredging projects. The Port has maintained the berthing areas and associated navigation infrastructure adjacent to the Port's deep water shipping terminal to permit use of the federal channel depths in this area consistent with the updated 1958 channel dimensions; and

**WHEREAS**, the federal channel in the Outer Waterway should continue to be maintained to support the Port's deep water shipping terminal; and

**WHEREAS**, the updated federal channel in the Inner Waterway has never been fully utilized, with the federal channel area deepened once in 1961, but without deepening of the Inner Waterway berth areas, development of necessary deep draft shoreline infrastructure or subsequent federal channel dredging since 1961; and

**WHEREAS**, the increasingly stringent fiscal and planning constraints on the Corps of Engineers' participation in channel maintenance make it very unlikely that federal participation can be obtained for the Inner Waterway area without the demonstration of requisite industrial land uses adjacent to the Inner Waterway, the deepening of the Inner Waterway berth areas, the costly construction of new deep draft shoreline infrastructure (that would be redundant with existing underutilized infrastructure in the Outer Waterway), and demonstration that such actions would not represent a net negative impact to environmental conditions in the project area; and

**WHEREAS**, between 1996 and 2000, certain shoaled portions of the federal channel within the Inner Waterway were determined to represent important marine habitats that, if preserved, would help support salmon recovery efforts under the federal Endangered Species Act, and portions of these areas were designated for preservation as shallow-water habitat under the Bellingham Bay Demonstration Pilot; and

**WHEREAS,** in 2001 Georgia-Pacific West, Inc. ("Georgia-Pacific") closed their local pulp mill operations, and announced their intent to sell some or all of their waterfront property in Bellingham; and

**WHEREAS**, in 2002 the Port and City of Bellingham sponsored a citizen task force, known as the "Waterfront Futures Group", to develop a compelling vision for the city's waterfront; and

**WHEREAS**, in 2004, following a robust public involvement process, the Waterfront Futures Group published a Waterfront Vision and Framework Plan ("community vision"), including a recommendation to transform portions of the land around the Inner Waterway area from one that was exclusively industrial to one which would be redeveloped to provide new commercial, business, residential, public access and habitat restoration uses; and

**WHEREAS**, in January 2005, the Port and City of Bellingham entered into an Interlocal Agreement to support the redevelopment of the land surrounding the Whatcom Waterway area, currently known as the "New Whatcom Special Development Area", according to the community's vision. The City of Bellingham subsequently rezoned the land around the Whatcom Waterway for mixed-use redevelopment, subject to completion of an area Master Plan; and

**WHEREAS**, in January 2005, following an extensive public involvement process, the Port acquired 137 acres of waterfront property from Georgia-Pacific on the south side of the Whatcom Waterway in order to implement the community's vision for revitalizing the central waterfront; and

**WHEREAS**, in November 2005 the Port and the Washington Department of Natural Resources agreed in a Memorandum of Understanding that the current

Whatcom Waterway federal channel, state waterway and harbor area designations should be updated to better reflect the current changes in the local economy, land uses, land use plans and navigation needs for the community waterfront; and

**WHEREAS**, in January 2006 the City acquired the Gaasland Property along the north side of the Whatcom Waterway in order to implement the community's vision for revitalizing the central waterfront by creating a mixed use redevelopment; and,

**WHEREAS**, in March 2006 the Port acquired the Chevron Property along the north side of the Whatcom Waterway in order to implement the community's vision for revitalizing the central waterfront by creating a mixed use redevelopment; and

**WHEREAS**, the acquisition of the Georgia-Pacific property, the Gaasland property and the Chevron property have placed almost all of the land surrounding the Inner Waterway in control of the Port and the City to implement the community's vision for revitalizing the central waterfront by creating a mixed use redevelopment; and

**WHEREAS**, the conditions necessary for implementation of the federal channel in the Inner Waterway are not consistent with the proposed implementation of mixed use redevelopment and habitat enhancement objectives defined in community planning efforts and during the Bellingham Bay Demonstration Pilot; and

**WHEREAS**, the Whatcom Waterway, including the federal channel, berthing areas and other adjacent aquatic lands, is a state-listed contaminated site under the Model Toxics Control Act (MTCA). Later this year, following public review and comment on a Remedial Investigation/Feasibility Study of cleanup alternatives, the Department of Ecology will select a Cleanup Action Plan for the site; and

**NOW, THEREFORE**, having considered all relevant information, the Commission of the Port of Bellingham finds as follows:

1. The federal channel in the Outer Waterway adjacent to the Bellingham Shipping Terminal and outward into Bellingham Bay should be preserved and maintained. That portion of the federal channel is needed to support deep draft navigation and commercial uses now and into the future. Substantial previous investments have been made by the Port to establish the necessary deep draft infrastructure and berth conditions necessary to support these uses in this area.

2. In the Inner Waterway, the development of new industrial land uses, deep berthing areas, shoreline bulkheads and deep draft navigation infrastructure as required to establish a federal interest in future channel maintenance in this area is inconsistent with the community vision for multiple waterfront uses including public shoreline access, habitat enhancement, transient moorage and mixed-use redevelopment.

3. Given the conflicts between the community vision and the narrow requirements of the federal channel program, there is a very low likelihood of acquiring federal funding for the Inner Waterway channel maintenance, and greater benefits can be achieved through operation of a locally-managed, multi-

purpose waterway in the Inner Waterway, in a manner responsive to the community vision.

4. Updating of the federal channel dimensions will also better focus federal funding requests on deep draft areas of the Outer Waterway consistent with federal program requirements and may enhance the Port's ability to secure future federal funds for channel maintenance in this area.

5. The conversion of the Inner Waterway from a federal channel to a locally managed multi-purpose waterway through de-authorization from the Bellingham Shipping Terminal inward to the Roeder Avenue Bridge is consistent with the current master planning process being conducted by the Port and City for the New Whatcom Special Development Area.

6. Timely updating of the federal channel dimensions will remove obsolete encumbrances on waterfront land use decisions and will enhance the permitting process and agency approvals that will be necessary to implement redevelopment, environmental remediation, navigation and salmon recovery projects within the Inner Waterway, consistent with the community land use vision.

**NOW, THEREFORE**, it is resolved that Port of Bellingham hereby requests that the Washington State Congressional Delegation include language in appropriate legislation to de-authorize the Inner Waterway portion of the Whatcom Waterway federal channel from station 29+00 to the head of the waterway at the Roeder Avenue Bridge.

**ADOPTED** in open session at a meeting of the Commission of the Port of Bellingham on the 16th day of May 2006, and duly authenticated by the signatures of the Commission and the seal of the Commission affixed hereto.

PORT OF BELLINGHAM COMMISSION

Jim Jorgensen

Jim Jorgensen, President

Scott L. Walker

Scott L. Walker, Vice President

Douglas G. Smith

Douglas G. Smith, Secretary

# RESPONSIVENESS SUMMARY

## WHATCOM WATERWAY SITE
## Bellingham, Washington

***Draft Supplemental Remedial Investigation/Feasibility Study and Draft Supplemental Environmental Impact Statement***

**<u>July 2007</u>**

**ISSUED BY:**

**WASHINGTON STATE DEPARTMENT OF ECOLOGY**

**TOXICS CLEANUP PROGRAM**

# 1. Introduction

On October 10, 2006 the draft Supplemental Remedial Investigation/Feasibility Study (RI/FS) and draft Supplemental Environmental Impact Statement (DSEIS) for the Whatcom Waterway site (Site) in Bellingham were issued for a 69-day public comment period. Public involvement activities related to this public comment period included:

- Distribution of a fact sheet describing the Site and the documents through a mailing to over 650 people, including neighboring businesses and other interested parties;
- Publication of three paid display ads in *The Bellingham Herald*, dated October 8, 2006, November 16, 2006, and November 30, 2006;
- Publication of notice in the Washington State Site Register, dated October 3, 2006;
- Two public meetings held on October 26, 2006 and December 7, 2006;
- A public hearing held on December 11, 2006;
- Posting of the documents on the Ecology web site; and
- Providing copies of the documents through information repositories at Ecology's Bellingham Field Office and Northwest Regional Office, and the Bellingham Public Library – Downtown Branch.

A total of 162 persons, organizations, and businesses submitted written and/or verbal comments on the RI/FS and DSEIS. The commenters are listed in Table 1-1. Comment letters and excerpts from the public hearing transcript are organized according to commenter in Appendix A. The full public hearing transcript is attached as Appendix B. Updates to select RI/FS figures and tables are attached as Appendix C.

Section 2 of this document provides background information on the Site and Site cleanup activities, Section 3 describes next steps. Sections 4 through 6 organize the comments received (and Ecology's responses) by topic:

- RI Comments and Responses: Section 4
- FS Comments and Responses: Section 5
- DSEIS Comments and Responses: Section 6

In Sections 4 through 6 where similar comments were provided by multiple commenters the comments are grouped together and the commenters identified by number (from Table 1-1). To review a comment in its original form, refer to Appendix A.

Table 1-1. COMMENTERS

1. Almaskaar, Roger
2. Ambrose, Peter
3. Anderson, Ken
4. Anderson, Richard
5. AquaBlok
6. Associated General Contractors
7. Badgett, Frances
8. Baker, Gary
9. Beall, Roni
10. Bean, Patty
11. Beddill, Marian
12. Bellingham Bay Foundation
13. Bellingham/Whatcom Chamber of Commerce
14. Bensen, Marvin
15. Blethen, John
16. Boland, Loraine
17. Botwin, Anne
18. Brenthaven
19. Bright, Doug
20. Britton, Tom
21. Brock, Garry
22. Brock, Sandra
23. Brunhaver, Kurt
24. Carlburg, Doug
25. Carper, Floyd
26. Carter, Laura
27. Charlton, Fred and Kirsti
28. Citron, Todd
29. City of Bellingham
30. Clasby, Deanna
31. Clossey, Debra
32. Clossey, Timothy
33. Cool, Seth
34. Coons, Joseph
35. Cournoyer, Kevin
36. Courtis, David
37. Crozier, Sharon
38. David, Dan
39. Dean, Rod
40. Divitt, Matia
41. Dodd, Doug
42. D'Onofrio, Ethan
43. D'Onofrio, John
44. Duncan, Clint
45. Durand, Dawn
46. Dyson, George
47. Ebenal General Inc.
48. Ekhart, Lance
49. Ernest, Don
50. Evans, Murphy
51. Fairbanks, Chris
52. Feld, Arlene
53. Ferris, Ryan
54. Fizzano, Perry
55. Foster, Kevin
56. Fredrikson, Keith
57. Friedman, Mitch
58. Fugelstad, Carol
59. Georgia-Pacific
60. Goodman, John
61. Gotchy, Celestine
62. Gotchy, Thomas
63. Gregory-Raffel, L Zapote
64. Hammond, Garth
65. Hass, Susan
66. Hayes, Hamilton
67. Heron, Riley
68. Herring, Eileen
69. Hertz
70. Hirst, Eric
71. Hutchins, Rebecca
72. Ingram, Charles
73. Irving, Steve
74. James, Paul
75. Johnson, Tip
76. Jones, Scott
77. Jorgensen, Donald
78. Karlburg, Doug
79. Kehoe, Bob

Table 1-1. COMMENTERS (continued)

80. Kemplin, Keith
81. Kilanowski, Elizabeth
82. Kimmich, Mike
83. Langei, Jim
84. Linder, Jacob
85. Lookman, Diane
86. Lowe, Robert
87. Lummi Nation
88. Mackay, Michael
89. Maliszewski, Charles
90. Malone, Tom
91. Mansker, Anna
92. McAuley, Michael
93. McCune, Mike
94. McDiarmid, M
95. McGowan, Kirk
96. McKee, Phyllis
97. Meyer, Jeanette
98. Milstead, James
99. Moore & Company
100. Nagel, Toni
101. Naismith, Anne
102. Niedermeyer, Thomas
103. NW Marine Systems LLC
104. Olsen, Thomas
105. Parker, Stan
106. Paskus, Matt
107. Paxton, Tim
108. Pemble, Constance & James
109. Pemble, Rodd
110. People for Puget Sound
111. Pike, Dan
112. Polaris Leadership Solutions, Inc.
113. Port of Bellingham
114. Post, David
115. Poynter, Keith
116. Pratum, Tom
117. Puget Sound Action Team
118. Raasch, John
119. Radtke, B W
120. Rangel, Mary Anne
121. Reisman, Barbara
122. RESources
123. Rex, RJ
124. Rhodes, Richard
125. Richards, Skip
126. Riek, Bob
127. Riek, Marsha
128. Rosati, Marissa
129. Rubash, Bert
130. Seestrom, John
131. Servais, John
132. Shapiro, Alex
133. Shaughnessy, Jon
134. Shaw, Deborah
135. Shellenberger, Matthew
136. Short, Michael
137. Smith, Gerald
138. Spencer, Julia
139. Streib, Darol
140. Tavelli, Terry
141. Teesdale, Mary
142. Thane, Niki
143. Thomas, Craig
144. Thompson, Bud
145. Thompson, Rick
146. Trautman, Kevin
147. Van Dyken, Roger
148. Vanderwyst, Max
149. Victoria San Juan Cruises
150. Washington Dept. of Fish & Wildlife
151. Washington Dept. of Natural Resources
152. Webber, Bert
153. Weeks, Jennifer
154. Weiner, Emily
155. Weiss, Jack
156. Wenning, Ralph
157. Western Washington University
158. Whatcom County Health Dept.
159. Wilcox, Ken
160. Wild, Scott
161. Williams, Marilyn
162. Williams, Richard & Fran

## 2. Background

The Site includes lands that have been impacted by contaminants historically released from industrial waterfront activities, including mercury discharges from the former Georgia Pacific (GP) chlor-alkali plant. The chlor-alkali plant was constructed by GP in 1965 to produce chlorine and sodium hydroxide for use in bleaching and pulping wood fiber. The chlor-alkali plant discharged mercury-containing wastewater into the Log Pond (an industrially-constructed pond open to the Whatcom Waterway) between 1965 and 1971. Between 1971 and 1979 pretreatment measures were installed to reduce mercury discharges. Chlor-alkali plant wastewater discharges to the Log Pond were discontinued in 1979 following construction of the Aerated Stabilization Basin (ASB). The ASB was constructed by GP for management of pulp and tissue mill wastewaters in compliance with the Clean Water Act. The outfall from the ASB continues to be owned by GP and wastewater and sediment quality in the outfall area are monitored under the National Pollutant Discharge Elimination System (NPDES) permit program.

Initial environmental investigations of the Site identified mercury in sediment at concentrations that exceeded MTCA standards (Chapter 173-340 Washington Administrative Code [WAC]) and Sediment Management Standards (SMS; Chapter 173-204 WAC). These are the state standards that govern the cleanup of contaminated sediment sites. The MTCA regulations specify criteria for the evaluation and conduct of a cleanup action. The SMS regulations dictate the standards for cleanup.

The key MTCA and SMS decision-making document for Site cleanup actions is the RI/FS. The RI/FS for the Whatcom Waterway Site was initiated in 1996 by GP under the terms of an Agreed Order with Ecology. The RI/FS included detailed sampling and analysis in 1996 and 1998. These sampling events formed the basis for development of an RI/FS Report which was completed in 2000 following public notice and opportunity to comment.

In parallel with the RI/FS, the Bellingham Bay Comprehensive Strategy Draft EIS (DEIS) was prepared and issued for public review. The DEIS was both a project-specific DEIS, evaluating a range of cleanup alternatives for the Site, and a programmatic DEIS, evaluating the Bellingham Bay Comprehensive Strategy. The Comprehensive Strategy was developed by an interagency consortium known as the Bellingham Bay Demonstration Pilot (Pilot). The Pilot brought together a partnership of agencies, tribes, local government and businesses known collectively as the Pilot Work Group, to develop a cooperative approach to expedite source control, sediment cleanup and associated habitat restoration in Bellingham Bay. The Comprehensive Strategy was issued by Ecology as a Final EIS (FEIS) in October 2000. The 2000 RI/FS and FEIS documents would have formed the basis for Ecology's selection of a final cleanup action for the Site under existing land uses. However, following completion of the 2000 documents significant land use changes made it necessary to complete a supplemental FS and Draft Supplemental EIS for the Site.

During 1999 and 2000, GP closed its chlor-alkali plant, its pulp mill and its chemical plant, dramatically reducing water treatment needs. With the reduced treatment needs, the contamination issues within the ASB could be addressed as part of the cleanup of the Site. To address this new portion of the Site, a new remedial alternative was evaluated in 2002 through a Draft Supplemental FS and a Draft Supplemental EIS. The new remedial alternative proposed using a portion of the ASB as a near shore fill disposal facility for disposal of contaminated materials removed from areas of the Site outside the ASB and from other contaminated sediment sites in Bellingham Bay. The proposal included maintenance of a down-sized wastewater treatment facility constructed within the footprint of the existing ASB.

Following completion of the 2002 Draft Supplemental FS, additional Site data were collected by GP during 2002, 2003 and 2004 under the terms of new and existing Agreed Orders with Ecology. The data collection included sediment testing of areas of the Site outside the ASB as well as testing of the ASB sludges and berm materials.

In late 2000 and early 2001 GP implemented an interim action to clean up sediment contamination in the Log Pond area of the Site. The work was performed under the terms of an Agreed Order with Ecology . The Log Pond project beneficially reused 43,000 cubic yards of clean dredging materials to cap contaminated sediments in the Log Pond, and to improve habitat substrate and elevations for use by aquatic organisms. The habitat restoration component of the project was voluntarily implemented by GP in accordance with the Bellingham Bay Comprehensive Strategy.

In January of 2005, the Port of Bellingham (Port) acquired 137 acres of waterfront property from GP including property within the Site. As a result the existing Agreed Orders between Ecology and GP for completion of an RI/FS and for the Log Pond Interim Remedial Action were amended to add the Port as a signatory.

When the original 2000 RI/FS was approved by Ecology land use in and around the Site was designated and used for industrial purposes, therefore the remedial alternatives under consideration reflected those uses. However, property ownership and Port land use plans have changed. The City of Bellingham and the Port are moving towards mixed-use zoning designations for upland areas adjacent to the Site. In addition, the Port has passed a resolution supporting the deauthorization of the federal channel in the inner portion of the Whatcom Waterway, to provide for multi-purpose uses of this area, and has proposed to develop the ASB portion of the Site for aquatic uses.

A new Supplemental RI/FS was completed for public review on October 10, 2006. The document integrates previous Site investigations and studies and provides a comprehensive evaluation of Site conditions and cleanup options under current and anticipated land uses. Ecology also issued a Draft Supplemental EIS (DSEIS) consistent with the State Environmental Policy Act (SEPA) and with the programmatic elements of the Pilot Comprehensive Strategy. The DSEIS evaluates the potential environmental impacts associated with the RI/FS remedial alternatives and potential mitigation measures that could be used to address these impacts.

## 3. Next Steps

As indicated in Ecology's responses in Sections 4 and 5 of this document, a number of comments have influenced Ecology's development of a draft Cleanup Action Plan (DCAP) for the Site as well as future remedial design considerations. However, the comments do not result in significant changes to the RI/FS and the document is now considered final.

Using information presented in the final RI/FS and DSEIS, and in consideration of the public comments received, Ecology has completed a DCAP that describes the actions proposed for the cleanup of contamination at the Site. The DCAP, and a draft Public Participation Plan (DPPP), are being issued for public comment as exhibits to a draft Consent Decree, which proposes to settle the liability of the parties agreeing to implement the cleanup. After consideration of public comments received, Ecology plans to issue a final SEIS, a final CAP and a final PPP, and then enter into a final Consent Decree in order to implement the CAP. The CAP and PPP will be exhibits to the final Consent Decree which will be entered in Whatcom County Superior Court. The cleanup will then move forward into design, permitting and construction.

# 4. RI Comments and Responses

## 4.1 General Concerns Regarding Mercury

**Comment:** Many commenters expressed general concern regarding potential health effects of mercury, given its status as a persistent bioaccumulative compound, the potential for mercury to form methylmercury compounds, and the potential health effects of mercury and methylmercury compounds as documented in studies in animals and humans in the scientific literature.

*(Refer to Commenters #12, 28, 63, 88, 98, 110 & 122)*

Response: Ecology shares the commenters' concerns about mercury in the environment, especially in light of the stated risks that mercury poses to human health and the environment. The State of Washington has promulgated cleanup standards in order to protect both human health and the environment. These cleanup standards apply equally to future and current protection of human health and the environment. The cleanup of Whatcom Waterway is one of Ecology's highest priorities.

## 4.2 Application of SMS Cleanup Standards

**Comment**: Multiple commenters expressed confusion or requested clarification over how the SMS cleanup standards for sediments were used in conjunction with the BSL to ensure protectiveness to human health and the environment. Some commenters believed that samples containing exceedances of the BSL could "test out" through bioassays. Other commenters requested clarification of what standard (SQS, MCUL or BSL) was to be met with the sediment cleanup. Other commenters argued against using bioassay testing at all, and that numeric chemical criteria should instead be used.

*(Refer to Commenters #28, 46, 87, 88, 89, 108, 109, 122, 142, 153 & 158)*

Response: As described in Section 4 of the RI Report, the MTCA Cleanup Regulation and the SMS provide the standards and remedy selection criteria to ensure the Site cleanup protects both human health and the environment. Human health protection is achieved primarily by limiting the potential for bioaccumulation of mercury in seafood. The site-specific BSL was developed for this purpose. The BSL is applied as a "ceiling" value for sediment mercury levels at the Site. There is no ability to "test out" using bioassays when the BSL is exceeded. In other words, if the BSL is exceeded, the area of sediments associated with that exceedence must be remediated. For the protection of benthic organisms, the SMS regulations establish a two-tiered regulatory program. The numeric SQS and MCUL chemical standards represent the first tier of this program. If sediments exceed these criteria, bioassays can be used to confirm whether or not the benthic organisms are protected in the sample. These protocols are defined in the SMS to directly measure benthic effects, over-riding indirect chemical testing methods. These protocols have been shown to be protective at cleanups throughout Puget Sound.

**Comment**: A number of comments addressed how SMS cleanup standards were applied to subsurface sediments. Some commenters implied that SMS cleanup standards should be applied directly to subsurface sediments.

*(Refer to Commenters #28, 35, 122, 142, 153 & 158)*

Response: The SMS stipulate that cleanup standards apply to the sediment biologically active zone (12 cm for the Whatcom Waterway Site), and also to subsurface sediments that are likely to be re-exposed and thus recontaminate the biologically active zone. SMS cleanup standards do not apply directly to subsurface contaminated sediments that are safely buried at depth and are unlikely to be re-exposed.

**Comment**: Other commenters indicated concurrence with the cleanup standards as applied at the Site, or expressed general support for the use of toxicity testing as part of the evaluation of compliance with cleanup levels.

*(Refer to Commenters #51, 104, & 158)*

Response: Comments noted. The cleanup standards contained in the SMS have been formally recognized by EPA as applicable criteria under the Clean Water Act, and bioassays are an integral part of these regulations.

**Comment**: One commenter argued that the lack of a strong correlation between mercury concentrations near the numeric SMS sediment cleanup standards and toxicity results in bioassays created excessive uncertainty regarding the protectiveness of cleanup.

*(Refer to Commenter #122)*

Response: Bioassays integrate a variety of potential toxic effects, including effects of chemicals that may be present but are not tested, bioavailability of contaminants, synergistic effects between chemicals, and other effects. The numeric criteria are intended to be conservative, and toxicity is frequently not observed until higher chemical concentrations are present. Correlations between the concentrations of a single chemical (i.e., mercury) and observed toxicity are often complex, because of other influences (e.g., varying phenolic compound concentrations for a given mercury concentration, oxidation of methylmercury). Ecology intends to continue the use of both chemical and biological testing as part of Site long-term monitoring to ensure compliance with cleanup standards.

### 4.3 BSL Issues

**Comment:** A number of commenters expressed concern about the use of the site-specific BSL as a cleanup requirement, stating generally that a more stringent cleanup standard is necessary to protect human health and the environment.

*(Refer to Commenters #7, 12, 28, 44, 88, 89, 109, 116, 142)*

Response: As discussed in Section 4.3 of the RI Report, the BSL addresses human health protection from bioaccumulation of mercury. SMS cleanup standards, including application of chemical and biological testing, ensure protection of benthic organisms living in the sediment. The BSL was developed based on standard risk-assessment processes and provides a valid estimate of the area-wide sediment concentrations that are protective of seafood consumption by high consuming populations. It was developed using conservative (i.e., highly protective) assumptions. Additionally, Ecology has applied this area-wide value in a more stringent manner, applying this value as a "ceiling" to specific areas of the Site on a point-by-point basis, even if these areas do not significantly affect the area-wide concentration of mercury. Ecology considers this application of the BSL to provide a significant and conservative level of protectiveness to human health.

**Comment:** The Whatcom County Health Department stated confidence that the BSL was developed using appropriate methods, and that as applied by Ecology at the Site will be protective.

*(Refer to Commenter #158)*

Response: As discussed in the previous comment response, Ecology concurs that the BSL was developed using appropriate methods and as applied ensures protection of human health from mercury bioaccumulation risks.

**Comment:** Several commenters stated concern that a risk assessment was not performed at the Site, and that potential uncertainties associated with the BSL were not identified or presented adequately using an uncertainty analysis. Some commenters requested that Ecology require production of a separate risk assessment or additional studies as part of the cleanup process.

*(Refer to Commenters #7, 12, 35, 110, 116)*

Response: The BSL was developed as part of the 2000 RI/FS, using risk assessment methodology consistent with Ecology and EPA guidance. An uncertainty analysis was included in that document, and is summarized in the 2006 Supplemental RI/FS. The 2000 RI/FS and the BSL information contained within it were issued for public review and comment. The BSL was developed using appropriate methods and as applied by Ecology ensures protection of human health from mercury bioaccumulation risks. Based on these considerations, no new analyses or studies are warranted.

**Comment:** Several commenters raised concerns that the mercury toxicity information used to derive the BSL addresses only short-term exposures to adults and does not address more sensitive receptors including pregnant women, children or individuals with a sensitivity to mercury toxicity. Other commenters expressed concern that the toxicity assumptions do not take into account the risks of long-term exposures.

*(Refer to Commenters #7, 28)*

Response: The key toxicity value (i.e., reference dose) developed for mercury is based on human and animal studies that assess both acute and chronic exposures to mercury, including fetal exposure, and measurements of sublethal effects such as impaired neurological development in children. The values used for the BSL development are consistent with those used by EPA and other regulatory agencies for human health risk assessment. The development of these values incorporates a substantial safety factor to address potential data uncertainties and ensure protection of sensitive individuals.

**Comment:** Several commenters raised concerns that the BSL development did not address tribal seafood consumption rates, that the fish consumption rates used were lower than federal risk assessment guidance, that these rates did not reflect seafood consumption rates for children, or that the rates otherwise under-estimate seafood consumption rates.

*(Refer to Commenters #7, 12, 28, 35, 87, 88, 89, 109, 110, 116, 122, 153)*

Response: Seafood consumption rates used in the development of the BSL were based on a targeted fish consumption study of tribal seafood consumption rates for the Tulalip and Squaxin tribes. That study remains one of the key regional studies for seafood consumption rates in native- American populations. The resulting measurements of consumption rates were higher (on a weight-normalized basis) in adults than in children. The higher (more protective) of the two values was used in the BSL development process. The fish consumption rates used in the BSL development included the 90$^{th}$ percentile rates from the study. EPA risk assessment guidance typically uses the 95$^{th}$ percentile for seafood consumption rates when the studies are not specific to high-consuming populations. This is done in order to ensure that the resultant values are reflective of high-consuming populations such as tribal seafood consumers. However, when the studies are targeted at high-consuming populations, the use of the 95$^{th}$ percentile is not appropriate, and the 95% UCL or the 90$^{th}$ percentile is more commonly used. The 90$^{th}$ percentile value (the higher of these two values in the Tulalip/Squaxin study) was appropriately used for development of the BSL. The fish consumption values used in the study are more stringent than those used in the development of federal and state water quality regulations, and their use results in a target fish tissue concentration (approximately 0.18 mg/kg) that is lower and more protective than federally recommended values developed by the FDA (1.0 mg/kg) and EPA (0.30 mg/kg). Ecology considers the derivation of the fish consumption rates and their application to the final BSL development process to be appropriate.

**Comment:** A number of commenters discussed the fish tissue data and the linear regression analyses that were performed to assess the relationship between sediment mercury levels and tissue mercury levels. Commenters articulated concerns with the adequacy of the tissue data, the manner in which the data were assembled for the regression analyses, and the type of line fitted to the regression data. A number of commenters stated that the regression analysis was invalid because it uses total mercury levels in sediment and tissue, whereas methylmercury is the predominant mercury fraction of concern for bioaccumulation in aquatic organisms.

*(Refer to Commenters #12, 44, 46, 87, 89, 122, 129)*

Response: Sediment and tissue data used for the BSL development included paired data, with the most important data set being the Dungeness Crab tissue data collected from Bellingham Bay. The analysis included studies performed by academic researchers and regulatory agencies including Ecology. The data were analyzed using standard linear regression techniques. Average values from each of the multiple studies were plotted, and the linear regression was performed using a best fit line. The regression outputs were then used to assess sediment concentrations that would be protective of human receptors. The regression analysis produced a strong correlation between sediment and tissue mercury levels in crab, and is considered by Ecology to be suitable for use in BSL development. Because the analysis was performed using paired endpoints (i.e., sediment total mercury and tissue total mercury) and because all tissue mercury was assumed to represent methylmercury for purposes of BSL development, the resultant BSL is considered by Ecology to be protective.

**Comment:** One commenter questioned whether site-specific bioaccumulation testing had been performed at the Whatcom Waterway site.

*(Refer to Commenter #122)*

Response: As discussed in the RI/FS, bioaccumulation testing was performed on sediments from the Whatcom Waterway site. The data are contained in Appendix E of the RI Report. Testing was performed using *N. virens* and *M. nasuta*. Results did not demonstrate any significant difference between test samples (mercury concentration 1.8 mg/kg) and controls or reference samples.

4.4 Seafood Quality

**Comment:** A number of commenters expressed general concern about seafood quality in Bellingham Bay, or expressed a desire to be able to consume seafood from Bellingham Bay. The Whatcom County Health Department stated that existing levels of mercury in fish and shellfish tissue have not warranted the issuance of a shellfish consumption advisory for Bellingham Bay.

*(Refer to Commenters #27, 71, 141 & 142 & 158)*

Response: As described in the RI/FS, concentrations of mercury in fish and shellfish in Bellingham Bay are below State, Federal and County thresholds of potential concern; and, have been declining.

**Comment:** RESources included in their comments a table summarizing recent sampling of crabs collected from the Whatcom Waterway Site. The reported tissue mercury concentrations ranged from 0.06 to 0.09 mg/kg wet weight.

*(Refer to Commenter #122)*

Response: The reported tissue mercury concentrations measured by RESources are well below EPA recommended safe seafood levels (0.30 mg/kg wet weight) and are well below the safe tissue level defined by Ecology as part of the BSL development (approximately 0.18 mg/kg). The measurements show a continued decline in tissue mercury concentrations consistent with natural recovery observations and the expected beneficial effects of Log Pond capping and sediment source control efforts.

**Comment:** Multiple commenters stated concerns specifically related to the potential for mercury at the Whatcom Waterway site to affect salmon in Bellingham Bay.

*(Refer to Commenters #61, 62, 87 & 122)*

Response: Concentrations of mercury in salmon from Bellingham Bay and the Nooksack River have been shown to contain mercury levels not significantly different from salmon collected in areas free of anthropogenic mercury impacts (e.g., Alaska salmon). There is no evidence that salmon, or mammals that consume salmon (i.e., Orca whales) have been adversely affected by Site mercury contamination. Cleanup of the Whatcom Waterway site will further reduce the potential for impacts to salmon to occur.

### 4.5 Vertical Distribution of Contaminated Sediments in Whatcom Waterway Channel

**Comment:** Several commenters stated a belief that the contaminated sediments were shallower than the federal channel dimensions, and that removal volumes for contaminated sediments from the Whatcom Waterway federal channel would be significantly less than those associated with the navigation dredging of the federal channel.

*(Refer to Commenters # 7, 10, 12, 35, 36, 49, 50, 71, 110 & 120)*

Response: The 1960s federal channel had a designed project depth of -18 ft MLLW (from the Roeder Avenue Bridge to approximately 750 ft out) and -30 feet MLLW (for the rest of the length of the designated channel). Maintenance of the channel under a navigation context would typically involve dredging the channel to these depths, plus additional over-dredging. As shown in Figure 3-7 of the RI Report, subsurface core testing has established that in most areas of the Whatcom Waterway, the depth of contaminated sediments is greater than the federal channel plus a significant over-dredge allowance. This is consistent with historical information regarding the depths of historical waterway dredging activity. The definition of dredge “prisms” required to remove contaminated materials from the Waterway areas and provide sufficient human health and environmental protection will be refined during remedial design and permitting, including additional subsurface core sampling in dredge removal areas.

### 4.6 Natural Recovery Issues

**Comment:** Several commenters stated that the performance of natural recovery had not been demonstrated at the Whatcom Waterway Site, or stated general opposition to the concept of natural recovery. One commenter stated concern about specific sample points where repeated sampling had not been performed during the 2002 PRDE studies, or where concentration reductions were different from the average rate of mercury reduction. One commenter requested additional monitoring prior to any consideration of natural recovery.

*(Refer to Commenters #12, 46, 57, 110, 116, 122)*

Response: As described in Section 6 of the RI Report, natural recovery has been assessed, quantified, and then re-verified. The 2002 sampling event provided an opportunity to monitor concentration trends in comparison to the 1996 sampling event. While not every sample from the original RI/FS sampling event was resampled in 2002, the overall pattern observed in most areas of the Site was a significant reduction in mercury concentrations. These data were analyzed along with physical data to assess potential sediment stability and recovery potential. Core sampling data and comparisons of surface and subsurface sampling data within the Inner Whatcom Waterway supplement the thin-sectioned natural recovery cores and demonstrate that cleaner sediments have progressively deposited in the Inner Whatcom Waterway, as well as in outer portions of the Site. The preferred alternatives identified in the RI/FS do not propose natural recovery as a remedial technology to address areas of the Site that exceed surface sediment cleanup standards. However, monitored natural recovery is proposed as a remedial technology for areas of the Site outside the Waterway that currently comply with surface sediment cleanup standards. Monitored natural recovery is thus not being proposed in these areas so that standards can be met; instead, it is being proposed as an added measure of protection to ensure the continued compliance with cleanup standards. The area requiring monitored natural recovery will be refined during remedial design.

**Comment:** One commenter used a sediment loading and mass balance approach to estimate potential natural recovery rates, and argued that there was a discrepancy between these calculated rates and those measured directly using natural recovery cores as described in Section 6 of the RI Report. Two commenters stated that more work was needed to define a sediment budget for the Site and assess the performance of natural recovery consistent with a sediment mass balance approach.

*(Refer to Commenters #110, 129)*

Response: Natural recovery studies conducted as part of the RI/FS appropriately relied on direct measurements of natural recovery rates using sediment cores and proven sediment dating methods. These methods provide a more reliable site-specific measurement of recovery rates than broad mass balance arguments applied throughout Bellingham Bay without direct confirming empirical measurements. Completion of a sediment budget in support of the mass balance arguments would not alter the direct measurements available for the Site. Ecology considers the natural recovery evaluation conducted as part of the RI/FS to be appropriate and sufficient to document the natural recovery processes at work in Bellingham Bay. Please note that the preferred alternatives identified in the RI/FS do not propose natural recovery as a remedial technology to address areas of the Site that exceed surface sediment cleanup standards (see above comment and response).

**Comment:** One commenter requested that graphics be provided showing the variability in sedimentation patterns within the waterway to supplement available information from sediment natural recovery cores and dating studies.

*(Refer to Commenter #150)*

Response: The sediment cross sections (e.g., Figure 3-7) from the RI Report provide a graphical summary of differential sedimentation rates within the Whatcom Waterway. Sediment quality differences are color-coded in the data summaries. Given the discrete dating interval for mercury releases at the site, the thickness of the mercury-containing sediment layer provides an estimation of the sedimentation occurring between the 1960s and the date of sample collection. The thickness of this contaminated sediment layer increases generally from the Outer Waterway (2-3 feet accumulation) toward the Inner Waterway (3-10 feet), indicating that sedimentation rates in the Inner Waterway are generally higher than that in the Outer Waterway.

## 4.7 Mercury Solubility & Water Quality

**Comment:** Several commenters expressed concern regarding the impacts of naturally recovered sediments or capped sediments on water quality.

*(Refer to Commenters #17, 61, 62, 116 & 122)*

Response: Water quality testing was included in the RI/FS process, including both sampling of Bellingham Bay, as well as monitoring of pore-water in capped areas of the Log Pond. Results of testing have demonstrated that water quality in both areas complies with surface water criteria. Subsurface core sampling has been performed in capped areas of the Log Pond and there has been no evidence of upward migration of mercury through the cap layers. The limited area of cap recontamination that has occurred in the southwest corner of the Log Pond is fully explained by erosion of impacted sediments from areas adjacent to the cap, and will be addressed by the final cleanup. The RI/FS and cap monitoring observations are consistent with scientific research that indicates that in marine sediments, most mercury forms relatively insoluble complexes with hydrogen sulfide, minimizing the quantity of mercury that can enter the water column. Water quality data for the Site indicate that capping and natural recovery can safely control water quality impacts and mercury mobility.

4.8 Studies of Mercury Methylation

**Comment:** Multiple commenters stated that the factors affecting the methylation of inorganic mercury are too poorly understood to support a cleanup decision at the Site, particularly one not involving complete removal of mercury from the waterway.

*(Refer to Commenters #12, 28, 44, 46, 75 & 88)*

Response: Most mercury-impacted sediments within the Whatcom Waterway Site consist of buried sediments located in depositional, deep-water areas. In stable marine sediments, methylation occurs primarily in the top portions of the sediment column, within the bioactive zone. Methylation in deeper sediment horizons is constrained by geochemical properties (e.g., hydrogen sulfide chemistry) of the sediments. In contrast, where impacted sediments are routinely disturbed, methylation of mercury can occur in the freshly exposed sediments. Controlling the concentration of methylmercury in the bioactive zone and in sediment horizons that are frequently disturbed minimizes the potential for mercury methylation to occur. Given the tendency of methylmercury to bioaccumulate in seafood, tissue monitoring provides a direct endpoint by which the success of mercury control efforts can be measured. Intermediate measurements of microbiologically-mediated methylation processes within the sediment are less helpful in monitoring the overall system and the effectiveness of mercury control efforts. The tissue monitoring data for the Whatcom Waterway site have shown decreases in tissue mercury concentrations as surface sediment mercury concentrations have declined through natural recovery and capping of the Log Pond. Additional detailed research into the mechanisms of methylation is not required prior to selecting and/or implementing cleanup alternatives at the Site. Tissue mercury monitoring will be a required element of the Compliance Monitoring and Contingency Response Plan prepared for public review as part of the remedial design phase of the cleanup.

4.9 Source Control & Timing of Cleanup

**Comment:** A number of commenters stated that they were concerned about the potential for soils and/or groundwater within the upland chlor-alkali plant site to recontaminate sediments in the Whatcom Waterway. Some commenters stated that sediment cleanup should be delayed until upland cleanup sites located near the Whatcom Waterway are completely remediated.

*(Refer to Commenters #7, 12, 35, 117 & 122)*

Response: The RI/FS describes the source control evaluations that have been conducted at the adjacent Chlor-Alkali Plant site and Central Waterfront site. While final cleanup of these upland sites has not been completed, the sites have been studied as part of on-going RI/FS activities. Groundwater evaluations have been performed at both sites indicating that the sites do not present ongoing recontamination concerns for the Whatcom Waterway sediments. Monitoring within the Log Pond has demonstrated that groundwater sources of contamination to the Log Pond are sufficiently controlled to prevent surface water quality impacts or sediment recontamination. Tissue monitoring for crabs within and near the Log Pond has demonstrated that seafood mercury levels are low and are declining. Since there is no evidence that these other sites are adversely impacting the Whatcom Waterway Site there is no reason to delay cleanup. The cleanup of the Central Waterfront site, however, will be coordinated with the cleanup of this Site since contaminated surface sediments comprising part of the Central Waterfront site overlay contaminated subsurface sediments at this Site in one area of the Waterway.

**Comment:** Other commenters expressed concern that stormwater could recontaminate sediments within the Whatcom Waterway following cleanup. Several commenters cited examples of sediment recontamination that have occurred due to stormwater discharges at other sites. One commenter requested monitoring at potential stormwater discharge locations after completion of cleanup.

*(Refer to Commenters #7, 12, 35, 117 & 122)*

Response: At some sediment cleanup sites around Puget Sound, stormwater has been a significant or predominant source of sediment contamination, particularly at heavily industrialized sites such as the Duwamish Waterway and portions of Tacoma’s Commencement Bay. Examples of recontamination of sediment cleanup sites have occurred where the ongoing source of stormwater contamination was not sufficiently controlled prior to implementation of the cleanup action. Bellingham Bay is less industrialized than these sites, and the primary pollution problems have been caused by historical point-source discharges rather than non-point source pollution from stormwater. Information reviewed, collected and compiled during the RI/FS indicates that stormwater is not a significant source of recontamination to Site sediments. Therefore Ecology considers it appropriate to move forward with cleanup of the Site and to require monitoring of sediment near significant stormwater discharge locations as part of Site long-term monitoring.

4.10 Requests for Additional Data Collection

**Comment:** Several commenters argued generally that there were gaps in the understanding of site conditions and that additional data collection should be performed. Some commenters stated that the existing data were adequate for completion of an RI/FS. But other commenters stated that additional data are required before the RI/FS can be concluded.

*(Refer to Commenters #12, 15, 36, 46, 50, 78, 88, 109, 116, 122 & 131)*

Response: Data collection is performed at different steps in the site investigation and cleanup process. The data collection efforts must be appropriate to each step, with different data required for site hazard assessments, RI/FS's, remedial design, construction and long-term monitoring. The existing data are sufficient to characterize site conditions and the nature and extent of contamination consistent with an RI/FS level of detail. Additional data will be collected during remedial design, with the scope of that data collection appropriate to the Site cleanup action ultimately selected by Ecology for the Site.

**Comment:** A number of commenters argued specifically that the collection of additional sediment core samples was required to develop estimates of removal volumes for contaminated sediment areas within the Whatcom Waterway or to delineate "hot spots" within the Waterway.

*(Refer to Commenters #12, 36, 46, 50, 78, 122 & 131)*

Response: The existing subsurface data for sediments are sufficient to estimate areas and volumes of impacted sediment, assess approximate depths required for sediment removal scenarios, assess cleanup requirements for sediment capping alternatives, and to assess sediment quality for evaluating disposal options. During remedial design, the collection of additional sediment coring data from planned dredging areas is appropriate to develop refined dredge "prisms" and associated design documents. Additional surface and subsurface data will be collected to refine the boundaries of capping and natural recovery areas. However, Ecology considers the existing data to be adequate for the current purpose of completing an RI/FS and selecting a remedy for the Site.

**Comment:** One commenter specifically requested the collection of more Log Pond monitoring data prior to implementation of Log Pond cap upgrades, or the collection of more subsurface data within the capped Log Pond to better characterize sediments beneath the sediment cap.

*(Refer to Commenter #122)*

Response: The Log Pond was capped in 2001 in accordance with an Interim Action Agreed Order with Ecology and under an associated Corps of Engineers permit. Required post-construction monitoring of subsurface sediments in 2001, 2002 and 2007 has shown that upward migration of mercury through the cap is not occurring, and collection of additional subsurface data is not warranted at this time. However, Ecology will consider these comments as part of developing future investigation plans for the remedial design phase of the cleanup. As discussed in Appendix I of the RI Report, some erosion has occurred along certain shoreline portions of the Log Pond cap. As part of the final cleanup of the Site, contingency actions will be taken to contain exposed contaminants and to prevent cap erosion.

**Comment:** Multiple commenters specifically requested the collection of additional sampling data in the natural recovery area at the head of the waterway.

*(Refer to Commenters #15, 46, 110)*

Response: Existing data sufficiently characterizes surface chemistry and biological conditions at the head of the waterway. However, monitored natural recovery areas identified in the final cleanup action for the Site, including the head of the Waterway, will be further evaluated during remedial design. Additional evaluations of the area at the head of the Waterway will include an assessment of sediment stability (i.e., assessment of low-tide/ high-flow conditions) as discussed in Section 5.5 of this Responsiveness Summary.

4.11 Discussion of Relative Contaminant Levels

**Comment:** Several commenters questioned the use of cumulative enrichment ratio as a measure of relative contaminant concentration, stating that the location of the contamination with respect to Bellingham Bay should also be taken into account when comparing different site areas.

*(Refer to Commenters #12, 35 & 122)*

Response: The cumulative enrichment ratio is an appropriate method for comparing relative contaminant concentrations. But it is correct that the potential environmental risks associated with contaminated sediments can vary substantially with location and depth of the sediment in question. The cumulative enrichment ratio is not used as the sole factor in assessing risk to human health and the environment. In other words, the measure of relative contaminant concentrations is appropriately used in the RI/FS because it is employed *in conjunction with* other factors to assess contamination risk and cleanup alternatives. These other factors are addressed as part of the comparative evaluation of remedial alternatives in the RI/FS and in Ecology's development of the draft Cleanup Action Plan.

**Comment:** Another commenter criticized the use of general statements regarding average concentrations in discussing site conditions, and argued that only specific measurements of concentration are useful in communicating site conditions to the public.

*(Refer to Commenter #36)*

Response: The RI/FS presents both discrete measurements of sample concentrations (i.e., contaminant measurements made at specific sampling depths and intervals) and average concentrations within specific depth horizons (e.g., sediment quality within the bioactive zone, or sediment quality within shallow subsurface sediments). Both types of measurements are helpful in communicating site conditions, but each must be used in its appropriate context.

4.12 ASB Status and Applicable Cleanup Standards (Upland v. Aquatic)

**Comment:** Two commenters questioned whether the ASB should be considered "upland" and not "aquatic", and questioned which types of cleanup standards would apply to sediments and sludges contained within the ASB.

*(Refer to Commenters #7 & 35)*

Response: As discussed in the RI/FS, the applicability of cleanup standards to the ASB varies depending on the use of the structure. The ASB is an engineered structure that was constructed in Bellingham Bay under an Army Corps of Engineers permit and other state and local permits. It is currently used for industrial wastewater treatment, such that neither "upland" nor "aquatic" cleanup standards apply directly to the contents of the ASB at this time. However, if wastewater uses are terminated, the waters and sediments within the ASB would be regulated under MTCA as a surface water body. MTCA surface water cleanup standards would apply to the waters contained within the ASB, and SMS standards would apply to the bioactive zone of sludges and sediments contained within the ASB. It is therefore appropriate to evaluate sediment quality within the ASB against these "aquatic" criteria. These criteria also apply if the ASB is opened to Bellingham Bay. Application of upland soil cleanup standards to the ASB is only applicable to scenarios that permanently convert the ASB to filled upland. In these scenarios, both groundwater and soil cleanup standards would apply. Thus, both "aquatic" and "upland" cleanup standards can apply to the ASB, depending on future reuse conditions. The issue of whether "aquatic" regulatory cleanup standards apply to the ASB is separate and distinct from questions of regulatory jurisdiction for land use permitting programs. These jurisdictional questions are more complex than simply “upland” or “aquatic”. For example, a structure that is considered “upland” under the Shoreline Management Act, can still be required by MTCA to be cleaned up to “aquatic” standards, because the two regulatory programs have different applicability and criteria.

4.13 Data QA/QC Comments

**Comment:** One commenter requested that Quality Assurance summaries be provided for all data collected during the RI/FS process, including both recently-collected and older data.

*(Refer to Commenter #87)*

Response: Chemical and biological data collected as part of the RI/FS were collected and analyzed consistent with Ecology-approved sampling & analysis plans. Data quality assurance reports were provided as part of original publications of the RI/FS data. Quality Assurance reports produced in previous editions of the RI/FS were not included in the supplemental documents, but are available at Ecology’s NW Regional Office.

4.14 Bioactive Zone Thickness

**Comment:** One commenter stated that the bioactive zone at the site should be set at 24 cm rather than 12 cm based on the maximum mixed-layer thickness measured in a natural recovery core.

*(Refer to Commenter # 122)*

Response: The median thickness of the mixed-layer was used to define a bioactive zone thickness for the site. The site-specific value of 12 cm is thicker than the value typically used throughout Puget Sound under SMS regulations (10 cm) and is appropriate for use.

4.15 Water Circulation

**Comment:** One commenter provided extensive comments supplementing information contained in the RI regarding water circulation patterns in Bellingham Bay. The commenter used revised water circulation estimates in a discussion of potential sediment deposition rates.

*(Refer to Commenter # 129)*

Response: The comments are noted by Ecology. However they do not have a direct bearing on the outcome of the RI/FS. Measurements of surface water quality performed during the RI/FS process have not documented exceedances of surface water criteria. Sediment deposition rates have been measured directly using sediment coring data, avoiding potential uncertainties associated using mass balance approaches. Additional water circulation studies are not required at this time as part of the RI/FS.

4.16 Radioactivity Measurements

**Comment:** Three commenters expressed concerns regarding measurements for radioactivity performed as part of past site investigations. One commenter raised concerns about laboratory reports and quality assurance samples related to the Cornwall Avenue Landfill site. The commenter requested that Ecology conduct radiological testing at the former GP properties based on the laboratory reports. Another commenter referenced the information provided by the first commenter regarding the Cornwall Avenue Landfill quality assurance samples. Additionally the second commenter referenced analyses performed on sediments for Cesium-137. A third commenter referenced general concerns about radioactivity, without citing a specific basis for those concerns.

*(Refer to Commenters # 53, 106, 131)*

Response: There is no evidence of releases of radioactive materials at or near the Whatcom Waterway Site. The Cornwall Avenue Landfill site is not the subject of the current RI/FS, but rather is a separate site. The laboratory reports referenced by the commenter were laboratory control samples and matrix spike/spike duplicate quality assurance samples. The sample results for the water samples in the report were non-detect for measured parameters, indicating that radioactivity levels were not elevated. Spike recovery results were within control limits indicating that the data quality was acceptable. The laboratory control sample results do not represent environmental media (i.e., soils, groundwater) but rather are separate control samples used by the laboratory to check instrument performance. Other samples tested as part of that study, but not cited by the commenter contained gross beta levels consistent with the potassium-40 activity naturally occurring in seawater. During 2004, the state Department of Health inspected the GP properties and found no evidence of radiological contamination. Cesium-137 is known to be present globally in marine sediments due to historic atmospheric nuclear testing performed between the 1950s and the 1970s. As described in Section 6 of the RI Report, cesium-137 profiles are used in natural recovery studies as dating tracers to estimate the time of sediment deposition. This isotope is used for these types of studies specifically because of its global distribution. The data are not indicative of a local release of radioactive materials.

4.17 Other Contaminants

**Comment:** Two commenters discussed past wastewater discharges of chromium, fluoride and ammonia documented in GP's Toxic Release Inventory reports. The commenters questioned whether the cleanup addresses potential impacts associated with historical releases of these compounds.

*(Refer to Commenters #37 & 107)*

Response: The Toxic Release Inventory is a federal database that documents permitted releases of certain chemicals from industrial operations. The information is readily available to the public on the internet. Potential impacts associated with historical releases of these compounds have been evaluated by both the Site RI/FS work and by monitoring performed under GP's NPDES wastewater discharge permit. The Site RI, and NPDES monitoring performed in 1999, included chemical and biological testing. The chemical testing program included measurements for chromium. No exceedances of screening levels were noted for that parameter. Biological testing provided a means of testing for effects from other potential sediment contaminants not included in the chemical testing program (e.g., ammonia, fluoride). The Site RI noted few exceedances of biological criteria, which will be addressed by the cleanup of the Site. The NPDES monitoring noted no exceedances of biological criteria.

4.18 Non-Sediment Mercury Issues

**Comment**: One commenter discussed historical use of mercury by the GP chlor-alkali plant, and speculated that mercury was discharged to the atmosphere during plant operations and/or was added to products manufactured at the plant.

*(Refer to Commenter #75)*

Response: The Site includes mercury contamination from historic releases of wastewater to the Whatcom Waterway. Investigations at this Site as well as neighboring cleanup sites (e.g. Central Waterfront, Chlor-Alkali Plant, Cornwall Avenue Landfill, R.G. Haley), have not indicated the existence of a contaminant air plume that has extended mercury contamination to a wider area. The MTCA cleanup regulation only addresses cleanup of hazardous waste that is released to the environment, and does not govern the manufacture or sale of useful products in commerce, even though they may be manufactured from or contain hazardous substances.

4.19 Specific Figure Comments

**Comment**: One commenter provided comments regarding Figure 5-10 of the RI Report. First the commenter requested that the figure include data from the Log Pond cap monitoring. Second, the commenter identified inconsistencies between Figure 5-10 plotted values and requested that the inconsistencies by rectified.

*(Refer to Commenter #12)*

Response:  The Log Pond monitoring data are included in Appendix I of the RI Report, including results from multiple monitoring events. The results were not plotted on Figure 5-10, 5-11 or 5-13 because sampling intervals were different than those of the early RI/FS sampling work, and the data would not have been comparable due to these differences. The inconsistencies on Figure 5-10 have been corrected, and updates made to the Appendix G Tables, Table 5-3 and Figures 5-10 through 5-13. The updated materials are attached as Appendix C.

# 5. FS Comments and Responses

5.1 Commenter Remedy Preferences

In addition to providing specific technical comments related to the Feasibility Study, many commenters stated general or specific preferences regarding the alternatives or the types of technologies that they'd like to see applied to the cleanup of the Site.

**Summary of Specific Preferences:** Out of 162 commenters, 91 stated a preference for one or more specific remedial alternatives. Table 5-1 summarizes these stated remedy preferences. Of these commenters, 50 stated a preference for one or both of the RI/FS preferred alternatives (Alternatives 5 & 6). Most commenters identifying these alternatives stated a preference for both Alternatives in comparison to the other RI/FS alternatives. For those commenters (18) stating a preference between these two alternatives, all but one stated a preference for Alternative 6.

**Table 5-1. Summary of Commenters with Specific Alternative Preferences**

| Alternative | | No. of Commenters Stating Preference: Subtotals | No. of Commenters Stating Preference: Totals | Commenters Indicating Preference |
|---|---|---|---|---|
| Specific Alternative Preferences | | | | |
| **Alt 1** | | | 0 | NA |
| **Alt 2** | | | 0 | NA |
| **Alt 3** | | | 9 | |
| | *As Presented in RI/FS* | 8 | | 12*, 24, 35, 41*, 50*, 121, 125*, 139 |
| | *Modified Version* | 1 | | 15 |
| **Alt 4** | | | 1 | 156 |
| **Alt 5 or 6** | | | 50 | |
| | *Alternatives 5 and/or 6* | 32 | | 1, 2, 16, 20, 21, 22, 26, 34, 39, 45, 55, 59, 72, 77, 83, 90, 95, 102, 104, 117, 118, 126, 127, 130, 134, 140, 144, 145, 146, 149, 150, 151 |
| | *Alternative 6* | 18 | | 6, 8, 13, 18, 29, 31, 32, 47, 51, 96, 99, 103, 112, 113, 147, 152, 157, 158 |
| **Alt 7** | | | 21 | |
| | *As Presented in RI/FS* | 11 | | 4, 12*, 36, 41*, 49, 50*, 70, 125*, 135, 159, 160 |
| | *Modified Version* | 10 | | 10, 28, 46, 71, 74, 76, 88, 92, 94, 154 |
| **Alt 8** | | | 9 | |
| | *As Presented in RI/FS* | 2 | | 131, 153 |
| | *Modified Version* | 7 | | 56, 73, 110, 116, 122, 124, 142 |
| **Other Remedies** | | | 5 | 3, 19, 54, 75, 78 |
| | **Total All** | | 95 | Includes four commenters expressing preference for more than one alternative (*) |

Alternative 7 was identified as a preference of 21 commenters. Of these 21 commenters, 11 stated a preference for Alternative 7 as described in the RI/FS, and an additional 10 stated a preference for a modified version of Alternative 7. The proposed modifications differed, ranging from addition of thicker caps and sideslopes in the Waterway, to removal of the capped Log Pond sediments. Four commenters favoring Alternative 7 also identified Alternative 3 as a second remedy preference.

Alternatives 3 and 8 each were identified by 9 commenters. Of the 9 commenters identifying Alternative 3 as a preference, only one commenter requested changes to the alternative. Of the 9 commenters stating a preference for Alternative 8, most (7 of 9) indicated a desire for modifications of the alternative. Desired modifications of Alternative 8 ranged from addition of thicker caps and side-slopes in the Waterway, to removal of the capped Log Pond sediments.

No commenters identified Alternatives 1 or 2 as a remedy preference. Only one commenter identified Alternative 4 as a remedy preference.

Five commenters developed their own alternatives that were significantly different than those discussed in the feasibility study. These alternatives included dredging with two different types of confined disposal sites, one proposal for sediment desalination and thermal treatment, one proposal to dredge the waterway (extent not defined) and cap the ASB, and one proposal to use the ASB for sediment dewatering followed by upland disposal of the sediments.

> Response: Taken as a whole, and in conjunction with the general preferences contained in other comments, the specific preferences summarized in Table 5-1 indicate that alternatives 1, 2, 3 and 4 have generally lower levels of community support than alternatives 5-8. The RI/FS preferred alternatives (Alternative 5 and 6) received generally favorable comments from a majority of commenters stating a specific remedy preference. Alternatives 7 and 8 were supported by commenters desiring a greater degree of contaminant removal from Bellingham Bay than conducted under the RI/FS preferred alternatives.
>
> Of the five new alternatives presented by commenters, the two confined disposal alternatives are conceptually similar to Alternatives 2 or 3 which received low overall ranking in the alternatives evaluation and which received relatively few comments of support. The alternative described as dredging of the waterway and capping of the ASB is assumed to be similar to either Alternative 3 or 4, which are already evaluated in the RI/FS. The remaining two alternatives use technologies that are not considered commercially viable at this time based on the technology screening presented in the RI/FS and based on recent sediment cleanup technology evaluations summarized by EPA. Ecology does not consider it necessary to evaluate additional alternatives beyond those already evaluated in the RI/FS. It should be noted, however, that improvements and other technical modifications to the alternative ultimately selected by Ecology will be considered

based upon additional data collected and subsequent alternative refinement during the remedial design phase of the cleanup.

**Summary of General Preferences:** Out of 162 commenters, 24 provided no statement of preference for a remedial alternative or remedial technology (see Table 5-2). In some cases these commenters provided specific technical comments on one or more of the documents. In other cases, the commenters provided only general statements of support or concern for the cleanup, without identifying a preference for a technology or cleanup alternative.

A total of 47 commenters stated general preferences regarding cleanup technologies or remedial alternatives, but these were not described in sufficient detail to link to a specific RI/FS remedial alternative. Table 5-2 summarizes the general preferences stated by these commenters.

**Table 5-2. Summary of Commenters Indicating General Preferences**

| Remedy Preferences | | No. of Commenters Stating Preference | Commenters Indicating Preference |
|---|---|---|---|
| *Preference Not Stated or Not Clear* | | ***24*** | 5, 17, 25, 37, 44, 53, 57, 63, 65, 66, 69, 81, 84, 89, 101, 105, 106, 107, 111, 115, 129, 132, 137, 141 |
| *Statement of General Remedy Preferences* | | *47* | |
| | Favors In-Place Management | 2 | 79, 161 |
| | Opposes Capping | 1 | 38 |
| | Favors Dredging & Upland Disposal | 13 | 9, 30, 40, 52, 60, 61, 62, 82, 108, 119, 120, 133, 155 |
| | Favors Cleanout of ASB | 2 | 86, 87 |
| | Favors "More" Removal | 6 | 7, 11, 14, 42, 43, 58 |
| | Favors "Full" Removal | 23 | 23, 27, 33, 48, 64, 67, 68, 80, 85, 91, 93, 97, 98, 100, 109, 114, 123, 128, 136, 138, 143, 148, 162 |

Of the 47 general preference comments, 2 commenters favored use of in-place sediment management (i.e., capping). In contrast, one commenter specifically objected to the use of capping, without providing further detail. The remaining commenters favored the use of some degree of dredging and upland disposal.

Of the 47 general preference comments, 13 favored the use of dredging and upland disposal, but did not specify locations or volumes for application of this technology. Two commenters favored cleanout of the ASB, without specifying a remedial technology or alternative for application to the balance of the site. Six commenters stated a desire for "more" removal, without any details regarding the extent or locations of this removal. These comments are generally interpreted as a desire for more removal than that performed under Alternatives 5 or 6 as described in the RI/FS. Similarly, 23 commenters stated a preference for “full removal” of contaminated sediments, without providing details of the extent or locations of this removal.

Response: As with the specific remedy preferences, the general preferences indicate support for remedial approaches involving removal of the contaminated sediments from the bay, and reduced support for remedies relying primarily on in-place management of contaminated sediments.

5.2 General Capping Concerns

**Comment:** Several commenters stated general concerns about application of capping technologies for long-term remediation at the Site. Commenters acknowledged that capping has been performed at contaminated sediment sites, and that contractor experience, engineering estimating tools, capping models, and regulatory guidance documents are available. But commenters expressed concern regarding longer-term cap performance and desired a weighting of permanence as part of the evaluation of alternatives. Comments listed under this subsection were general in nature. Specific capping concerns or comments are listed under later subsections.

*(Refer to Commenters #4, 12, 33, 37, 73, 75, 76, 88, 94, 105, 110, 111, 116, 136, 153, 154 & 155)*

Response: Capping has been identified by EPA in its Assessment and Remediation of Contaminated Sediments (ARCS) program as a demonstrated remedial technology suitable for permanent cleanup of contaminated sediment sites, provided that the caps are engineered appropriately and are applied in suitable locations. These conclusions were reaffirmed with the publishing of EPA’s Contaminated Sediment Remediation Guidance for Hazardous Waste Sites in December of 2005 (http://www.epa.gov/superfund/resources/sediment). Application of capping has been proposed in the RI/FS preferred alternatives for certain areas of the Site where caps are appropriate. The thickness and type of capping material would vary with site-specific conditions and the chemical composition of underlying sediments. Monitoring of pore-water in the Log Pond cap has demonstrated that mercury is stable under capping conditions, even in nearshore areas containing capped subsurface sediment mercury. Caps have been used in Puget Sound for successful remediation of contaminated sediment sites since the 1990s. Detailed engineering evaluations will be conducted as part of remedial design and permitting to ensure that caps, if used as part of the cleanup action, are designed in a manner that ensures their long-term stability. Monitoring will be included to document long-term performance, and contingent actions will be implemented if caps do not perform as designed. Cap design, compliance monitoring and potential contingent actions will be subject to public review as part of a draft Engineering Design Report. Ecology believes that sufficient information is available to demonstrate the performance of capping as a viable remedial technology for use in the RI/FS. The MTCA alternatives evaluation process includes preferences for application of the most permanent remedial alternatives and technologies. These MTCA preferences are described in the Feasibility Study and have been considered in Ecology's development of a DCAP for the Site.

**Comment:** Commenters from the Washington Department of Fish and Wildlife and the Whatcom County Health Department expressed support for capping technologies provided that they are applied appropriately at the site and ensure long-term isolation of the contaminants from the biologically active environment and natural resources in Bellingham Bay.

*(Refer to Commenters #152, 158)*

Response: Ecology concurs with these comments. Detailed engineering evaluations will be conducted as part of remedial design and permitting to ensure that caps, if part of the selected cleanup action, are designed in a manner that ensures their long-term stability. Monitoring will be included to document long-term performance, and contingency actions will be taken if the `caps do not perform as designed. Compliance monitoring will directly measure the performance of the cap with respect to bioactive zone sediment quality and food chain mercury levels.

5.3 Wind & Wave Erosion

**Comment:** A number of commenters have expressed concerns that sediment caps applied at the Site may be eroded by wind-driven waves, and requested additional evaluation of wind and wave erosion effects. One commenter expressed concern that wave patterns cannot be predicted and that changes considered for the ASB cannot be evaluated prior to construction. Another commenter expressed concern that sediments at Starr Rock are shallow and vulnerable to wave erosion. Generally these comments about wave erosion were coupled with an argument against the use of capping at the Site as part of the final cleanup action.

*(Refer to Commenters #56, 63, 81, 87, 109, 122, 142 & 162)*

Response: Ecology concurs that additional evaluation of wind and wave erosion is required at the Site. As part of remedial design activities, Ecology will require additional wind and wave stability evaluations to be performed for cap and natural recovery areas. These evaluations will be performed using accepted design standards, detailed evaluation of site-specific conditions in different areas of the site, documented weather patterns and trends, and appropriate factors of safety. Sufficient engineering assessment was performed as part of the RI/FS to demonstrate proof of concept and define conceptual design assumptions for cost analysis at the RI/FS level of detail. Note that in the development of the draft Cleanup Action Plan for the Site, Ecology has incorporated some removal of contaminated sediments in shallow-water areas of sediment site unit 5B ("Shoulder" of the ASB) to achieve a cap surface elevation that minimizes wave energies affecting the cap. The effects of shoreline changes can be assessed using computer wave models, and if necessary physical models. Water depths at Starr Rock are well below the intertidal and shallow subtidal elevations at which wave energy is most significant, but this area will be included in the design-level stability evaluations. Cap design will be subject to public review as part of a draft Engineering Design Report.

**Comment:** Several commenters expressed concern related to storm surges and their potential impact on the sediment cleanup remedy.

*(Refer to Commenters #7, 81, 87, 122)*

Response: Storm surges present as a higher-than-normal tide, caused by offshore storm activity. In Puget Sound, storm surges generally increase (rather than decrease) water depths during storm events. Storm surges are significant in the design of above-water structures such as jetties, breakwaters, and dikes; but pose less of a design limitation for submerged caps. Because erosional forces on sediment caps tend to decrease with increasing water depth, the storm surges tend to reduce effective erosional force on sediment caps (i.e., by increasing the water depth over submerged caps, and by reducing the portions of intertidal caps exposed to breaking waves). Analysis of storm surge effects on sediment stability will be included as part of the additional design evaluations.

### 5.4 Prop Wash & Navigation Disturbances

**Comment:** Several commenters have expressed concern that the performance of capping remedies will be affected by anthropogenic disturbances including prop wash from various types of vessels, anchor drag, potential vessel groundings, vessel wakes and fishing activities including placement and retrieval of crab pots. One commenter specifically questioned the depth of anchor drag effects cited in the RI/FS.

*(Refer to Commenters #28, 51, 56, 63, 87, 109, 122 & 143)*

Response: Ecology concurs that anthropogenic disturbances are a significant factor that must be considered in design of any capping remedy. The RI/FS included a preliminary analysis of these potential considerations. Depth of anchor drag varies depending on the types of vessels involved. The greatest effects are observed for large vessels (e.g., container ships, oil tankers) using general deep-water anchorages, and for large ocean-going barges that may drag anchor chains during waterway maneuvering. For the Site, applicable anchoring disturbances for the Inner Waterway and harbor areas are mainly those associated with small boats typical of mixed-use waterfront uses. These effects are typically greater than those associated with fishing gear deployment and retrieval. Conceptual designs presented in the RI/FS consider the use of cap armoring and the use of increased cap thicknesses in the Inner Waterway to address potential impacts associated with prop wash, vessel groundings and anchor-drag. The use of dredging in deep draft navigation areas near the shipping terminal is considered by Ecology to be a priority to minimize potential impacts where these are anticipated to be greatest. In these deep-draft areas prop wash effects may be greater due to the presence of large deep-draft vessels, the use of bow thrusters on intermediate-sized vessels, and waterway use by larger tug vessels. Additional analysis of potential anthropogenic effects on cap stability will be conducted during remedy design and permitting for any cap areas included as part of the final cleanup action at the Site. These cap areas would also require application of institutional controls (use restrictions) to reduce or eliminate future anthropogenic effects.

## 5.5 Whatcom Creek Flood Effects

**Comment:** Three commenters cited concerns that during high rain events, creek flows at the mouth of Whatcom Creek may affect sediment stability.

*(Refer to Commenters #73, 87 & 143)*

Response: Ecology shares this concern. Monitored natural recovery areas identified in the final cleanup action for the Site, including the head of the Waterway, will be further evaluated during remedial design. Additional evaluation of the head of the Whatcom Waterway will include an assessment of low-tide/ high-flow conditions and assessment of potential storm/flooding effects on sediment stability.

## 5.6 Effects of Climate Change

**Comment:** Several commenters expressed concerns that global warming is considered likely to increase sea levels, and that this rise may impact sediment stability. Additional concerns were expressed that storm severity or frequency may increase due to the effects of climate change.

*(Refer to Commenters #73, 101, & 110)*

Response: Ecology has been an active participant in evaluations of global warming and its potential impacts on people and the environment in the Puget Sound area. Scientific consensus is that some climate changes will occur and that sea levels will rise, though the extent of these changes is subject to scientific debate. As with storm surge (Section 5.3), increases in sea levels would affect primarily the design of above-water structures such as jetties, breakwaters, and dikes; but pose less of a design limitation for submerged caps. Because erosional force on submerged sediment caps tends to decrease with increasing water depth, increasing the sea level would tend to reduce effective erosional force on submerged sediment caps, and would reduce the portion of intertidal caps exposed to breaking waves. Because the extent of sea level rise remains uncertain, Ecology will consider a range of potential sea levels during remedial design and permitting. Current sea levels will likely be the limiting design condition for intertidal and subtidal areas, whereas potential increased sea levels may affect shoreline stability evaluations in high intertidal and adjacent upland shoreline areas. Potential changes in storm severity or frequency will be addressed by including an increased margin of safety in sediment stability analyses.

5.7 Seismic Stability & Tsunamis

**Comment:** Multiple commenters expressed concerns related to potential seismic events and associated shoreline or sediment disturbance. One commenter noted that portions of the RI/FS replicated a seismic analysis performed during the design of the Log Pond Interim Remedial Action.

*(Refer to Commenters #9, 11, 56, 63, 81, 98, 110, 119, 122, 133, 143 & 162)*

Response: As discussed in the RI/FS, the Puget Sound region is an area of known seismic activity. Seismic stability is a factor that Ecology and EPA routinely require be evaluated as part of remedial design and permitting for sediment capping or confined disposal facility construction projects. An example of this is the analysis conducted as part of the Log Pond Interim Remedial Action, which has been summarized as part of the current Supplemental RI/FS. As discussed in the RI/FS, seismic effects relevant to the project include liquefaction and lateral spreading. Liquefaction and lateral spreading occur most frequently in thick sequences of saturated, unconsolidated sandy soils/sediments. The effects on sediment stability are greatest in steep-sloped shoreline areas on or adjacent to these liquefaction-prone areas. As discussed in the RI/FS and DSEIS, the risks of shoreline instability are decreased by reducing the height and steepness of sideslopes. Disruption of the sediment surface within the waterway by sand boils is less likely due to the relatively thin sequence of sandy sediments underlying the Whatcom Waterway (dredging of the waterway removed much of the original loose sandy materials) and the high silt and organic content of the Whatcom Waterway sediments overlying the sandy material. The remedial design process for the Site will include detailed analysis of geotechnical and seismic stability, and appropriate mitigation measures will be included in the final design of any cleanup action implemented at the Site.

**Comment:** A number of commenters specifically cited concerns about tsunamis that may occur in association with a seismic event.

*(Refer to Commenters #11, 110, 122, 143 & 162)*

Response: Due to its geography and history of seismic activity, the Pacific Coast and the Puget Sound region are periodically exposed to tsunamis. Extensive work has been conducted recently by NOAA and other researchers to evaluate likely ranges of tsunami effects, and to identify areas particularly prone to inundation during tsunami events. The Site area is not identified as a high risk area for tsunami inundation, though portions of the bay near the Nooksack river delta are of greater concern. In the Site area, the effects of tsunamis are likely to be similar to high-water events caused by storm surges. As with storm surges (Section 5.3), these potential effects are most significant for design of above-water structures such as jetties or shoreline buildings. The increased water levels occurring during tsunami events tend to increase sediment stability relative to typical conditions. Potential tsunami effects will be included in seismic and sediment stability analyses conducted during remedial design evaluations.

5.8 Specific cap design comments

**Comment:** One commenter provided clarifying information on the AquaBlock product line that can be used to reduce permeability of a sediment cap, and in some situations to function as a reactive cap. The commenter provided references to several recently completed projects using the AquaBlock product.

*(Refer to Commenter #5)*

Response: Ecology appreciates the clarifying comments regarding the applications of the AquaBlock product for sediment capping. Consideration of specialty products for capping enhancement is a remedial design issue which will be addressed after Ecology’s selection of a cleanup action for the Site.

**Comment:** Two commenters indicated that reactive capping methods should be considered for enhancing mercury sequestration by sediment caps.

*(Refer to Commenters #116, 122)*

Response: Reactive capping has not been eliminated from consideration as part of the future design process. However, findings from capping of the Log Pond sediments has indicated that pore-water in sediment caps has been consistent with surface water criteria, and thus natural geochemical processes, combined with the physical sequestration provided by the sediment cap are sufficient to meet remedial action objectives. Avoidance of physical disturbance of the sediment cap will likely represent the design consideration with the greatest impact on cap design.

**Comment:** Two commenters expressed concern over application of capping in areas where pilings are present.

*(Refer to Commenters #28, 122)*

Response: Cap design evaluations will address issues related to the application of capping in areas with pilings. These considerations include both potential effects of the cap on the pilings (e.g., geotechnical down-drag effects) as well as evaluations of the effects of the pilings on the cap (e.g., procedures to be used to avoid recontamination during piling maintenance or removal activities). Under the proposed land uses, the number and types of pilings present within the site will be significantly reduced compared to current conditions, with removal of many of the existing over-water wharves present in areas that may be capped as part of the final cleanup. Further evaluation of this issue will be conducted as a part of design and permitting for the cleanup action.

**Comment:** Two commenters stated general concerns about the application of capping in steeply sloping areas.

*(Refer to Commenters #28, 122)*

Response: It is generally true that capping effectiveness depends in part on the control of sideslope grades. The effective slope limitations vary with the type of capping material and the site-specific conditions. Flatter slopes provide greater stability for a given type and size of sediment. The use of flatter sideslopes provides enhanced stability during seismic events. Remedial design evaluations will include an evaluation of sideslope stability under static and seismically active conditions, with adjustments made to the remedial design as appropriate. Adjustments can include cutting back slopes or adding stabilizing material at the base of the slopes, or modifying the type of material used.

**Comment:** Two commenters discussed the potential for wood waste to affect cap stability due to potential methane production during wood waste degradation, or to reduced sequestration for chemical contaminants compared to other sediments.

*(Refer to Commenters #12, 46)*

Response: The type and extent of wood waste varies throughout the Site. The highest concentrations were observed in portions of the Log Pond. These areas have been capped as part of the Interim Remedial Action, and no negative effects attributable to wood waste have been noted on cap performance. Wood waste abundance in other site areas is less extensive. Potential impacts of wood waste on cap chemical and physical stability will be evaluated as part of remedial design evaluations for specific cap areas included in the final cleanup action.

**Comment:** A number of commenters stressed the benefits of using caps that are thicker than the standard 2-3 feet commonly used in Puget Sound, particularly in areas with higher subsurface mercury concentrations. Multiple commenters stressed that this should be considered even in cases where this might trigger some sediment removal prior to cap placement.

*(Refer to Commenters #7, 12, 122 & 150)*

Response: Ecology concurs that the use of different cap thicknesses in different areas of the site and/or under different cleanup alternatives is appropriate.  Alternatives 4, 5 and 6, already reflect a thick cap of up to 6 feet in areas adjacent to the Log Pond. Based on planned land and navigation uses and existing water depths, the use of thick capping in this area under Alternatives 4, 5 and 6 does not require additional dredging prior to cap placement. The use of a thicker cap in this area is intended to provide an incremental degree of protection against physical cap disruption, and to enhance processes that tend to physically and chemically sequester contaminants. A thinner cap in this area is appropriately included under Alternatives 7 and 8 which leave less residual contamination present beneath the cap. Cap thicknesses in other lesser-contaminated areas are appropriately not as thick, and are based on a nominal cap thickness of 3 feet pending final design evaluations.

**Comment:** Two commenters argued that some sediments that may require dredging for cleanup or navigation uses, particularly from the outer portions of the Whatcom Waterway (i.e., Site Units 1A & B) may be suitable for beneficial reuse or PSDDA disposal and should not be assumed for upland disposal in project cost estimates.

*(Refer to Commenters #35 & 36)*

Response: Ecology concurs that sediments removed from the outer portion of the Whatcom Waterway may be suitable for PSDDA disposal or beneficial reuse. Cost estimates for the RI/FS alternatives 4 through 8 are based on this assumption, consistent with previous sediment testing in these units. Potential beneficial reuse options include use of the material as a capping subgrade in the Whatcom Waterway. Similarly, if clean materials are generated from other areas of the waterway during cleanup and/or navigation dredging, these materials may be managed by PSDDA for disposal or beneficial reuse. Sediments from the Inner Waterway area, however, have been shown to contain contaminant levels that exceed PSDDA disposal and beneficial reuse criteria. Cost estimates for alternatives 4 through 8 appropriately assume the use of upland disposal for sediments dredged from Inner Waterway areas.

**Comment:** One commenter requested that the RI/FS include an extensive summary of capping and dredging case studies. Another commenter recommended consideration of EPA's recent December 2005 guidance document titled Contaminated Sediment Remediation Guidance for Hazardous Waste Sites (http://www.epa.gov/superfund/resources/sediment).

*(Refer to Commenter #122, 59)*

Response: The RI/FS contains sufficient discussion of sediment remedial technologies, including dredging and capping, to screen technologies for Site application and to assemble and comparatively evaluate remedial alternatives. This level of analysis is appropriate for a MTCA RI/FS. Remediation case studies are appropriately summarized in regulatory guidance documents prepared by EPA and the Corps of Engineers including the one referenced by the second commenter. The RI/FS conveys a number of design considerations that will be addressed during remedial design.

**Comment:** Two commenters requested specific clarifications regarding capping design assumptions. One commenter requested that cap design life assumptions be specified, and a second commenter requested clarification of how dredging and capping would be applied in Unit 1C under Alternative 6.

*(Refer to Comments #122, 150)*

Response: The goal of sediment capping under a MTCA final cleanup action is to develop caps that are stable and that become a permanent part of the natural environment. In depositional systems such as Bellingham Bay, this ensures that the potential for cap maintenance and repair problems decreases with time rather than increases. The use of institutional controls (use restrictions) provides for perpetual maintenance of the caps and ensures that anthropogenic activities do not affect the integrity of the cap. Under Alternative 6, all portions of Unit 1C would be dredged. In contrast, under Alternatives 4 and 5, shallow portions of Unit 1C (subareas 1C-1 and 1C-2) would be dredged, whereas deeper portions would be capped without prior dredging (subarea 1C-3).

5.9 Grey Whale Exposures

**Comment:** One commenter cited past observations of grey whales sounding in Bellingham Bay near the Whatcom Waterway site, and expressed concern regarding potential physical disturbance by the whales of the site sediments, and regarding potential toxicity of the sediment contaminants to the grey whales.

*(Refer to Comment # 159)*

Response: The use of Bellingham Bay by migratory grey whales, and the potential for whales to conduct opportunistic feeding within Bellingham Bay and the Site, is well documented. Sections 4 and 6 of the RI Report include an analysis of potential feeding induced sediment disturbance and an evaluation of potential health effects for grey whales exposed to Site sediments. Site conditions are not considered by Ecology to pose a potential health risk to grey whales. Appropriate measures have additionally been incorporated into the RI/FS preferred alternatives (e.g., thick caps in areas adjacent to the Log Pond) to minimize potential physical disturbances in more impacted areas.

5-10. Length & Type of Cap Monitoring

**Comment:** Many commenters desired additional information on the scope, frequency and duration of cap monitoring that will be required as part of remedy construction and monitoring. Some commenters specifically requested that cap monitoring periods be extended to at least 30 years. Other commenters stated that the level of monitoring should not be uniform over all site areas, but should be proportionate to contaminant levels and the disturbance risks in various site areas.

*(Refer to Comments #7, 10, 12, 51, 82, 111, 114, 122 & 150)*

Response: Compliance monitoring is a required element of all cleanup actions. For cleanup actions involving sediment capping, compliance monitoring includes three types of monitoring. First, protection monitoring (e.g., water quality testing) is performed during cap installation to ensure compliance with project permits, and to ensure protection of human health and the environment during cap construction. Second, performance monitoring is conducted to document that the cap installation has met criteria defined in project design and permitting. Finally, confirmational monitoring is used to document that the cap is physically stable and continues to meet chemical and biological performance standards after construction is complete. The draft Cleanup Action Plan developed by Ecology includes a monitoring framework that establishes basic goals and expectations of the monitoring program, including long-term confirmational monitoring. Ecology anticipates requiring a minimum of 30 years of confirmational monitoring (likely years 1, 3, 5, 10, 20 and 30 following construction), with potential additional monitoring or implementation of contingency actions required if the cap has not yet been shown to represent a stable and permanent part of the natural environment. Ecology concurs that the density of sampling locations should not be uniform, but rather should be more dense in areas with higher subsurface contaminant levels, greater levels of anthropogenic activity and/or erosional forces, or other factors that increase the potential for recontamination to occur. Monitoring will at a minimum include physical, chemical and biological monitoring using bathymetric surveys, shoreline inspections, chemical sediment testing, contingent bioassay testing and mercury tissue monitoring for benthic species (i.e., Dungeness crab). A detailed Compliance Monitoring and Contingency Response Plan will be issued for public review as an element of a draft Engineering Design Report expected to be completed in 2009. This plan will include specific testing locations, protocols and interpretive criteria.

5-11. Costs of Cap Monitoring

**Comment:** A number of commenters argued that the costs included in the RI/FS did not accurately reflect the costs of long-term monitoring. In particular, commenters noted that the costs of monitoring were the same for alternatives 1, 4, 5, 6, 7 and 8, even though more sediment removal is conducted under Alternatives 7 and 8 than in the other alternatives. Some commenters argued that the costs of monitoring may have been so severely underestimated as to influence the comparative evaluation of remedial alternatives, and the identification of RI/FS preferred alternatives.

*(Refer to Comments #7, 10, 12, 17, 28, 33, 41, 46, 48, 50, 88, 93, 109, 114, 120, 122, 125, 142, 155 & 159)*

Response: The RI/FS cost estimates for monitoring of cap and natural recovery areas assumed completion of four monitoring events each, with an average per-event cost of $160,000 (expressed in constant $2005). Alternatives 2 and 3 had additional monitoring costs allocated to monitoring of confined disposal facilities constructed under these two alternatives. The $160,000 per-event monitoring cost for cap & natural recovery areas is considered by Ecology to be a reasonable estimate for Alternatives 6 and 7, though final costs will be subject to additional development of the monitoring scope and plan as part of remedial design. However, the costs probably do underestimate (by 10-25%) the monitoring costs for Alternatives 1, 4 and 5 which have a greater capping and natural recovery footprint. Similarly the costs likely overestimate (by 10-25%) the monitoring costs for Alternative 8 which has a smaller cap footprint. Further, Ecology anticipates requiring at least two additional monitoring events (for all alternatives) such that overall monitoring costs will increase for all alternatives. These adjustments to the monitoring costs would not change the analysis of alternatives or the outcome of the analysis. These adjustments will be reflected in Ecology's draft Cleanup Action Plan.

5.12 Contingent Remedies and Repairs

**Comment:** Separate from the costs of cap monitoring, multiple commenters requested that cost estimates be expanded to include defined line items for periodic cap repairs and contingent remedies. A number of commenters argued that the comparative evaluation of alternatives and the identification of a preferred alternative would be affected if remedy repairs and contingencies were included. Some commenters requested that specific contingencies and trigger-levels be specified in the Consent Decree.

*(Refer to Comments #4, 7, 10, 12, 17, 28, 33, 41, 50, 71, 76, 82, 85, 109, 114, 117, 122, 155 & 159)*

Response: Cap designs considered in the RI/FS are intended to provide stable conditions that do not require active scheduled cap maintenance. Therefore, it is not appropriate to include a presumptive, recurring cost for cap maintenance (e.g., annual maintenance). Contingent risks are associated with all remedies. The RI/FS cost estimates currently include a cost contingency of 30%. Potential additional contingent risks could apply to all remedies, but this does not affect the RI/FS cost analysis which must be based on definable and estimable costs. The argument that long-term risks are generally reduced by alternatives that remove more contamination is addressed in the MTCA evaluation criteria for long-term effectiveness and permanence. Specific monitoring requirements, contingencies and trigger levels for different site areas will be developed for public review as part of remedial design.

5.13 Navigation Dredging Costs

**Comment:** One commenter expressed concern that costs associated with future maintenance dredging in the waterway will be substantially increased due to the presence of capped contaminated sediment under the RI/FS alternatives, and that incremental navigation dredging costs should be included in the alternatives evaluation.

*(Refer to Commenter #46)*

Response: Conceptual designs for caps in navigation areas where future maintenance dredging may be required include sufficient design overdepth to allow for maintenance dredging, and cap areas near the Log Pond have been thickened in the RI/FS preferred alternatives in order to provide an additional degree of protection. Based on these provisions, incremental costs of navigation are not expected to be significant. The periodic costs of navigation dredging are appropriately excluded from RI/FS cost estimates since these are not remedial costs and would be incurred whether or not capped sediments are present in the Waterway.

### 5.14 Upgrades to Log Pond Cap

**Comment:** Multiple commenters concurred that the planned improvements to the shoreline edges of the Log Pond cap should be performed promptly, as part of the first phase of remedial action as described in the RI/FS.

*(Refer to Commenters #29, 88 & 157)*

Response: Ecology appreciates this concern. It is anticipated that contingency actions to contain exposed contaminated subsurface sediments and to prevent future cap erosion will be implemented as part of the first phase of the final cleanup action.

**Comment:** Several commenters expressed an opinion that the observed conditions in the Log Pond demonstrate flaws in capping as a technology, and cause concern about any application of capping for long-term remediation at the Site.

*(Refer to Commenters #4, 7, 73, 109, 110, 116, 122, 125, 153, 155)*

Response: As discussed in the RI/FS, the performance of the Log Pond cap has generally been good, with the exception of the observed erosion at two cap edge areas where the cap was the thinnest. The cap has successfully sequestered mercury contaminants and prevented impacts to surface sediment or water quality throughout the main portion of the cap. The cap has also proven an effective enhancement to habitat conditions within the Log Pond, and serves as important habitat for crab, juvenile salmonids and other species. Observed erosion indicates the need to consider a more rigorous cap design throughout other areas of the Site where physical erosional processes may occur at a range of tidal elevations, and to consider how cap edges are seated into shoreline areas. These factors have been considered in the conceptual design of the RI/FS alternatives and will be considered in Ecology's development of the Draft Cleanup Action Plan. Detailed cap designs will be developed for public review as part of remedial design and permitting.

**Comment:** Two commenters specifically requested discussion of concentration trends in samples within the Log Pond, including stations SS-301, SS-40 & SS-76.

*(Refer to Commenters #87, 122)*

Response: Sample SS-301 is located immediately offshore of the area in the southwest corner of the Log Pond where cap erosion and recontamination has been observed. Mercury concentrations in this sample were higher at Year-5 monitoring event than in previous events, but did not exceed the SQS. Completion of contingency actions to cap eroded areas and to install energy-dissipating groins will further protect the cap against increases in mercury concentrations at this station. Sample locations SS-40 and SS-76 are located near the extreme offshore edges of the Log Pond. Concentrations of mercury at these stations remain well below the SQS, despite being located near sediment areas not yet remediated. At station SS-76, mercury concentrations exceeded the numeric SQS, but did not exceed the SQS based on over-riding confirmational bioassays. Increasing concentrations of mercury in this sample are associated with its proximity to unremediated sediments in adjacent areas and equilibrium of concentrations between these locations.

5.15 Effectiveness of natural recovery

**Comment:** Several commenters expressed the belief that historic trends of natural recovery and sediment deposition may terminate in the near future, or at least that there is a significant degree of uncertainty on this point. These commenters generally requested that Ecology avoid selection of any remedy that relies on continued natural recovery to comply with cleanup standards.

*(Refer to Commenters #7, 12, 57, 73, 122 & 129)*

Response: Multiple lines of evidence have demonstrated that Bellingham Bay represents a natural depositional system, and that natural recovery through burial of contaminated sediments has been significant. Some changes to the rate of natural recovery could occur if significant sediment inputs to the bay were substantially altered (e.g., partial or complete modification of the Nooksack River discharge location). Were such a dramatic change to occur, only one of the RI/FS remedial alternatives (Alternative 1) would be substantially affected. That alternative relies significantly on continuation of natural recovery processes to comply with cleanup standards. In all other cases, the remedial alternatives use active remedial measures (dredging or capping) to remediate areas of contaminated surface sediment. Ecology does not intend to select Alternative 1 as the remedial plan for the Site, however. The natural capping that is expected to continue to occur, although not necessary to meet surface sediment standards under other remedial alternatives, will further improve conditions at the Site after completion of the construction phase of remediation. This will result in improvement of surface sediment beyond the requirements of the cleanup action.

5.16 Dredging Disturbance & Residuals

**Comment:** One commenter stated that remedy expectations for removal of “all of the mercury” are not practical, and that some mercury will remain on site under any realistic scenario.

*(Refer to Commenter #1)*

Response: The remedial alternatives presented and evaluated in the RI/FS include varying levels of removal. Alternative 8, which includes the greatest amount of removal, was shown to be impracticable through the FS evaluation. Ecology considers the range of alternatives presented in the RI/FS to be a reasonable representation of potential remedial approaches. All alternatives involve some on-site management of mercury-contaminated sediments.

**Comment:** Multiple commenters discussed the relationship between dredging and short-term risks to water quality, or to sediment quality through recontamination and dredge residuals. One commenter anticipated that mercury levels will “spike” during removal efforts. Commenters differed in their weighting of short-term risks, with some arguing that buried contaminated sediments should be left in place and not disturbed, whereas others argued that short-term risks associated with contaminant removal are more than offset by other gains in environmental protection.

*(Refer to Commenters #12, 17, 34, 55, 79, 114 & 122)*

Response: As presented in Section 7 of the FS Report, the MTCA evaluation of remedial alternatives considers short-term risk management as an element of the disproportionate cost analysis. Risks of water quality or sediment quality impacts, construction safety hazards, and potential impacts to fisheries resources are considered as part of this analysis and are significant factors in evaluation of construction techniques for sediment cleanups. However, the disproportionate cost analysis also considers other factors such as long-term effectiveness, remedy permanence and costs. In naturally recovered areas such as Bellingham Bay, removal of buried contaminated sediments generally produces short-term adverse impacts to water quality and often generates low volumes of dredge residuals. These short-term adverse impacts cannot be entirely eliminated. Where incremental sediment removal is not required to comply with cleanup standards, and does not result in a proportionate gain in environmental benefit, these short-term risks become significant in the disproportionate cost analysis. Ecology has conducted an updated evaluation of Alternatives 5 through 8 as part of its development of the draft Cleanup Action Plan for the Site. The Draft Cleanup Action Plan is currently available for public review and comment.

**Comment:** One commenter requested that the Cleanup Action Plan provide a specific plan for managing dredge residuals in dredging areas.

*(Refer to Commenter #150)*

Response: All dredging methods involve the generation of some dredging residuals. The residuals are minimized, but not eliminated, through the use of best practices during dredging and material handling. In areas that are proposed for capping after dredging (these areas vary with remedial alternative), the capping will ensure compliance with cleanup standards at the time of construction. The RI/FS discussed different options for managing dredge residuals within the ASB (Alternatives 5-8). A management approach for dredge residuals within open-water areas of the site where subsequent capping is not proposed will be defined as part of the remedy design and permitting, and as part of the Compliance Monitoring and Contingency Response Plan. Potential management methods include redredging in cases where residuals are excessive, and application of monitored natural recovery and enhanced natural recovery for most other instances. The Compliance Monitoring and Contingency Response Plan will be subject to public review.

**Comment:** Two commenters argued that the Whatcom Waterway and/or Log Pond areas should be isolated by sheet-piling installation to allow complete dredging in these areas without impacting water quality or creating other short-term risks.

*(Refer to Commenters #28 & 122)*

Response: The use of sheet-piling to isolate the Whatcom Waterway and Log Pond areas of the site and allow removal of all contaminated sediments from these areas of the site is not considered by Ecology to be a feasible approach for site remediation for the following reasons. First, even if these actions could be performed safely, the costs of these actions would be substantially greater than those already evaluated for RI/FS Alternatives 7 and 8. These alternatives were shown in the RI/FS to have costs that were substantial and disproportionate relative to the incremental degree of risk reduction achieved. This conclusion would be even more extreme if additional costs of sheet pile isolation were conducted. Second, the use of sheet-piling alone would not be effective at isolating the Site area. Coffer dams or soil dams with installed barriers would be required to resist hydraulic pressures and maintain isolation of the enclosed area. Third, short-term risks are not eliminated by the sheet-piling approach, as impacts to fisheries resources would be significant during the period of construction, given that the work could not be completed within a single "fish window", and rerouting of the mouth of Whatcom Creek would be required during the extended construction period.

5.17 Sediment Dewatering

**Comment:** Multiple commenters recommended that further evaluation be given to sediment dewatering, with the objective of saving on disposal costs and making the removal of additional sediments from the site more economical. Some reviewers recommended that the ASB be used to temporarily stockpile and dewater dredged sediments.

*(Refer to Commenters #7, 12 & 78)*

Response: The RI/FS evaluations included an evaluation of potential sediment dewatering methods. Different technologies are available for sediment dewatering, with the performance of those methods varying depending on the physical and chemical properties of the dredge materials. Due to the costs, time and logistical requirements (e.g., multiple handling of the same sediments, treatment of separated waters) sediment dewatering is usually not economical (i.e., cost savings are not achieved) except for limited passive dewatering of dredged materials, and mechanical dewatering of very wet materials such as the ASB sludges. Potential use of the ASB for temporary passive dewatering of sediments would be limited to upper portions of the area above the level of surface/groundwater, and would be limited to performance during dry portions of the year which are limited in duration and do not always coincide with construction "fish windows". Passive dewatering of ASB sludges in the ASB area (subject to these other limitations) would be additionally limited by the physical properties (i.e., the hydrophilic nature of the secondary treatment biosolids) and would be even less effective than the mechanically enhanced solids separation evaluated as part of the RI/FS. Based on these factors, the use of the ASB area for sediment dewatering was not evaluated as part of the remedial alternatives. Ecology considers the evaluations of dewatering methods contained in the RI/FS to be sufficient for completion of the RI/FS and remedy selection. Dewatering assumptions may be further refined as part of remedial design and permitting.

### 5.18 Future Sediment Treatment

**Comment:** Multiple commenters requested that the final cleanup of the site be deferred for an unspecified period of time to allow for development of potential future sediment treatment methods. Several of the commenters indicated that the sediments could be stockpiled in the ASB or in specially constructed tanks pending final cleanup at this deferred date.

*(Refer to Commenters #78, 97, 159 & 161)*

Response: The RI/FS technology screening section includes a summary of current technologies that are available or are under development for in situ and/or ex situ treatment of sediments and sludges. With the exception of dewatering for certain materials, no treatment technologies were identified that had the appropriate combination of implementability, effectiveness and cost for incorporation into the RI/FS remedial alternatives. No technologies were identified that are under development and that can be reasonably expected to achieve commercial viability in the near future for treating Site sediments and that are likely to change the outcome of the technology screening. Furthermore, appropriately designed and permitted disposal sites are available for managing dredged materials generated during site cleanup. Given the SMS preference for a Site restoration time-frame of less than 10 years, Ecology does not consider temporary sediment storage to be an appropriate interim cleanup action for the Site.

### 5.19 Dredging Methods

**Comment**:  Three commenters discussed specific dredging methods as part of their comments, in some cases expressing a preference for hydraulic dredging, in another case recommending use of mechanical dredging, and in the third case acknowledging that both types of dredging may be used at the site as part of the final cleanup.

*(Refer to Commenters #12, 14 & 139)*

Response: The RI/FS included extensive discussion of different dredging methods, and developed conceptual designs for remedial alternatives based on specific dredging methods and materials handling assumptions. It is likely that both types of dredging will be used as part of the final remedial action, with each technique applied in appropriate site areas. However, final determinations must await completion of remedial design and permitting. The analysis conducted to date is sufficient for completion of the RI/FS, development of cost estimates and selection of a cleanup action.

## 5.20  ASB Comments

**Comment**:  Three commenters made specific technical comments related to cleanup activities in the ASB portion of the site. Two commenters discussed the potential need to reline the ASB if the liner is damaged during dredging and if the liner is required as part of the remedial action (i.e., as part of RI/FS Alternative 3). The third commenter questioned the need to install sheet piling within the ASB berm as part of cleaning out of the ASB sludges and contaminated sediments under Alternatives 5 and 6.

*(Refer to Commenters #12, 35 & 59)*

Response: The disturbance of the ASB lining during dredging of ASB sludges can reasonably be expected to occur under Alternative 3. The RI/FS discusses several methods of addressing this issue, including adjustment of ASB water levels, driving of sheet-piling within the ASB berm and/or installation of new lining. This is a design detail which does not substantially affect the RI/FS evaluation of alternatives or selection of a cleanup action. With respect to Alternatives 5 and 6, the installation of sheet-piling was considered as part of the scenario involving initial hydraulic dredging of ASB sludges followed by dewatering of the ASB for removal of dredging residuals and transition zone sediments. Installation of the sheet-piling would be required to accomplish this second step without excessive water generation. Ecology concurs that the minimization of water seepage into the berms during wet dredging is a secondary benefit that may not in itself justify installation of the sheet-piling, as seepage may be minimized through water level maintenance or other measures. This issue will be revisited as part of remedial design and permitting.

## 5.21 Unit 3A Remedy Comments

**Comment**: Three commenters requested that additional remedial actions be taken at the head of Whatcom Waterway within Site Unit 3A, rather than using monitored natural recovery as described in the RI/FS preferred remedial alternatives. All three commenters affirmed a desire to provide shallow-water habitat in this area. Two commenters proposed dredging of this area followed by reconstruction of habitat using a thick layer of clean materials. The third commenter requested evaluation of sediment capping in this area.

*(Refer to Commenters #46, 122, 150)*

Response: To date the surface sediments at the head of Whatcom Waterway have been found to comply with Site cleanup levels, such that monitored natural recovery is the remedial technology identified for this area under preferred Alternatives 5 & 6. Ecology intends to require further sediment data collection and additional evaluations of sediment stability in this area during remedial design. Based upon the remedial design evaluations, the cleanup action currently identified for this area could be adjusted as necessary to ensure long-term compliance with Site cleanup levels, minimize erosion and optimize sediment stability. A draft Engineering Design Report reflecting the outcome of remedial design evaluations will be developed and subject to public review.

### 5.22 Additional Habitat Actions

**Comment**: Numerous commenters requested that additional actions be taken under Alternatives 3, 7 or 8 to enhance habitat within the Whatcom Waterway. These three remedial alternatives involve deep dredging of the former 1960s industrial navigation channel, which in turn requires installation of hardened shoreline infrastructure to safely conduct dredging of deeper sediments. The commenters recommended that after deep dredging, the area be backfilled with clean material to restore and enhance nearshore shallow-water habitat along the sides and at the head of the waterway. Commenters speculated that these changes to the alternatives would change the output of the RI/FS alternatives evaluation process.

*(Refer to Commenters #15, 28, 35, 46, 65, 109, 110, 142, 154)*

Response: If deep dredging of the Inner Whatcom Waterway is conducted exclusively for cleanup, and if there is no intent to use the area for deep draft navigation or to maintain the area as part of the federal navigation channel, then backfilling of the area with clean material to restore more gradual sideslopes could be conducted in order to mitigate some of the land use and habitat impacts associated with the deep dredging. Bulkheads would still be required to ensure stability of the shoreline during dredging, and these costs would need to be added to the cleanup cost referenced in the RI/FS (i.e., because the costs of the bulkheads are not carried by a separate navigation or development project as they would be if the area was to be used for deep draft navigation). The temporary bulkheading and sideslope backfill would serve as required mitigation for geologic issues, though addition of the sideslopes may exceed the mitigation measures that could reasonably be required as part of cleanup. The ability to mitigate habitat impacts would potentially be significant to Alternative 8 or to Alternative 3 which have less net gain of habitat than Alternatives 2 and 7. Adding sideslopes as habitat mitigation would likely exceed the mitigation measures that could reasonably be required under Alternatives 2 and 7 due to the net habitat benefits already incorporated in these alternatives. These changes to the remedial alternatives would affect (increase) the costs of the alternatives, but would not provide significant new cleanup benefits that would proportionately offset these costs or change the outcome of the RI/FS analysis.

**Comment**: Several commenters requested the development of remedial alternatives involving the complete cleanup and removal of the ASB structure, followed by construction of shallow-water habitat in that area of the site.

*(Refer to Commenters #28, 80, 87, 109, 122, 123, 124, 159)*

Response: The MTCA cleanup of the Site is based upon ensuring protection of human health and the environment under specific land and navigation uses. The Port of Bellingham, the current owner of the ASB, has informed Ecology that they intend to open the ASB to Bellingham Bay and develop a Clean Ocean Marina including public shoreline access and habitat enhancements. Ecology's regulatory responsibility is to implement a cleanup action that is protective given this use scenario. The full removal of the ASB berm and the construction of nearshore habitat in the footprint of the ASB is a land use decision that would have to be made by the Port.

**Comment**: One commenter requested that a modified Alternative 3 be implemented in which a portion of the ASB was filled with contaminated sediments and sludges, and a portion of the ASB was reopened to Bellingham Bay for development of nearshore aquatic habitat. A second commenter proposed the construction of a new off-site confined nearshore disposal facility, and construction of habitat in the offshore berm sections of this facility.

*(Refer to Commenters #15, 75)*

Response: The alternative described by the first commenter conflict's with the Port's plans for the ASB area of the Site as understood by Ecology (see response above). The alternative described by the second commenter develops a large new enclosed harbor basin, and constructs other in-water features on state-owned aquatic lands. This is a land use decision that would need to be made by the Department of Natural Resources (DNR) as the manager of state-owned lands. Comments regarding land use cannot be addressed by Ecology within the scope of the Site cleanup and should be directed to DNR.

5.23 Cost Accuracy

**Comment**: Multiple commenters expressed concern that the costs of dredging Whatcom Waterway sediments in Alternatives 7 and 8 were inflated over likely costs necessary to remediate these areas. Commenters argued that a significant volume of clean sediment that could be managed by PSDDA disposal or beneficial reuse was being classified as contaminated under these alternatives and assigned costs of upland landfill disposal in cost estimates. Commenters further stated that the depth of dredging under these alternatives was greater than that required for removal of contaminated materials.

*(Refer to Commenters #10, 12, 35, 36, 49, 50, 71, 76, 110 & 120)*

Response: Alternatives 7 and 8 both conduct dredging of the Inner Whatcom Waterway channel sediments to depths necessary to permit use of the 1960s industrial channel. Based on existing core sampling data the depth of contamination in this area generally exceeds that required to permit full channel use and allow for capping of residual contamination below elevations -23 and -35 feet MLLW. This observation is consistent with historical bathymetric surveys that show the dredging depths in these areas to generally exceed the minimum Corps-authorized project dimensions during the 1960s and 1970s when the majority of the sediment contamination occurred. Sediments in this area have been subjected to multiple rounds of subsurface sediment testing, and contaminant concentrations have repeatedly been shown to exceed allowable limits for PSDDA disposal or beneficial reuse. Ecology considers the cost estimates for Alternatives 7 and 8 as presented in the RI/FS to be reasonable and appropriate, and the uncertainties relating to the estimates to be within the contingency range customary to an RI/FS report. Additional sampling to refine sediment volumes in this area is not required to evaluate remedial alternatives in an RI/FS or to select a final cleanup action for the Site.

**Comment**: Two commenters questioned how the costs of shoreline infrastructure that is associated with deepening of the Whatcom Waterway channel in RI/FS Alternatives 2, 3, 7 and 8 are incorporated into the RI/FS cost analysis. The commenters argued that there may be a cost savings for these alternatives if the channel sideslopes are backfilled for shoreline stabilization and the construction of habitat benches after dredging.

*(Refer to Commenters #12 & 50)*

Response: The core cost estimates in the RI/FS for Alternatives 2, 3, 7 and 8 do not include the costs associated with upgrading shoreline infrastructure. A portion of this infrastructure (i.e., bulkheads) is required in order to permit deep dredging in waterway and berth areas, regardless of whether the area is backfilled for habitat, or used for deep draft navigation. The remaining infrastructure (docks and wharves) is required only if the area is used for deep draft navigation. These costs were not included in the core cost estimates of the RI/FS, to avoid artificially inflating the minimum remediation costs of these alternatives. Under a deep draft navigation scenario (not currently viable given planned land uses) these incremental infrastructure costs would have been allocated to industrial redevelopment activities. If on the other hand the area is backfilled for habitat, then the costs for bulkheading necessary to permit deep dredging would need to be added to the core remediation costs for these alternatives, along with the costs to purchase and place the additional backfill materials. These additions would increase the core costs of Alternatives 2, 3, 7 and 8 beyond those currently carried in the RI/FS.

**Comment**: One commenter questioned whether the capping costs in Alternative 7 were inflated unnecessarily by the assumption that some of the capping materials used for capping the Inner Whatcom Waterway after dredging would need to be purchased, rather than assuming reuse of berm materials from the ASB as in Alternatives 5 and 6.

*(Refer to Commenter #12)*

Response: In order for ASB materials to be beneficially reused in dredge areas for subsequent capping, the materials must be available at the time that capping is required. Under Alternative 7 two full dredging seasons are required to complete the first phase of construction and remove contaminated materials from the Inner Waterway, with additional time required to install infrastructure for shoreline stabilization prior to sediment removal. Pending further design evaluation, costs were included for cap material purchase to ensure that cap materials would be available at the time that dredging is completed and capping can be initiated. The inclusion of these incremental costs is reasonable for this alternative. Because the costs are small relative to the total costs of this alternative (approximately $1 million relative to a $74 million remedy cost), changing this cost assumption would not affect the overall RI/FS alternatives evaluation.

5.24 Unit Costs

**Comment**: One commenter questioned why the cost estimates were not developed using uniform unit costs (i.e., X $/cyd for dredging, and X $/cyd for capping) and simpler spreadsheets. Commenters found the format of the cost estimates more difficult to review and compare between alternatives and technologies.

*(Refer to Commenter #7)*

Response: Cost estimates were developed using specific conceptual design scenarios that could be realistically accomplished, and using labor, materials, equipment, transportation and disposal costs applicable to a specific construction sequence. Because the project is somewhat complex and involves multiple inter-related phases of work, this type of estimating provides a greater degree of accuracy than application of gross unit cost assumptions.

5.25 Disproportionate Cost Analysis

**Comment**: Several commenters questioned the analysis of alternatives and the disproportionate cost analysis performed in the RI/FS. Some commenters desired the development of new or modified alternatives (e.g., deep dredging of waterway plus backfill for habitat). One commenter recommended that the disproportionate cost analysis be based on an analysis of mercury mass removal and costs as the best basis for comparison between alternatives. Some commenters argued that land uses were over-emphasized in the analysis of alternatives, whereas others argued that some of the alternatives were inappropriately rejected as they don't fit with planned community land uses. Other commenters expressed dissatisfaction with the characterization of "public concerns" in the RI/FS, given that their individual concerns or alternative preferences were different than those discussed in the RI/FS.

*(Refer to Commenters #7, 12, 35, 48, 50, 109, 110, 122, 129 & 154)*

Response: In part due to these comments, Ecology has conducted a revised evaluation of Alternatives 5 through 8 as part of its development of the draft Cleanup Action Plan for the Site. The disproportionate cost analysis element of the evaluation incorporates weighting factors and a more detailed ranking methodology, better describes the rationale for the analysis, provides quantitative information, and incorporates public concerns expressed during the RI/FS public comment period, as reflected in this Responsiveness Summary. Alternatives 1 through 4 are not evaluated by Ecology as possible cleanup actions for the Site, for two reasons. First, Alternatives 1 through 4 cannot be executed given the Port's aquatic use plans for the ASB portion of the Site. Second, the Port has proposed removal of contaminated sludges and sediments from the ASB portion of the Site, which represents the most permanent cleanup alternative for this site unit. Given that a permanent cleanup alternative has been proposed for this one area of the Site, only those cleanup alternatives that incorporate this approach to the ASB (Alternatives 5-8) are considered in Ecology's evaluation. The basic parameters used in the evaluation of alternatives and in the disproportionate cost analysis are specified under MTCA regulations. These regulations require evaluation of the benefits of an alternative as defined using six specific criteria (permanence, protectiveness, long-term effectiveness, short-term risk management, implementability and public concerns). The relative benefits of alternatives are then compared against those of the most permanent alternative, and the incremental benefits and costs associated with each alternative evaluated.

5.26 Project Funding

**Comment**: Multiple commenters expressed a desire to analyze the costs of the cleanup using "net costs" rather than the total costs of cleanup. Some commenters argued that costs should not be considered if these are covered by the insurance policy procured as part of the Port-GP transaction. Other commenters argued that costs should be excluded from the analysis if the costs are potentially offset by remedial action grants.

*(Refer to Commenters #7, 35, 48, 50)*

Response: The MTCA analysis of remedial alternatives and the disproportionate cost analysis must be performed using total costs of cleanup. The other factors identified by the commenters may have significance with respect to how the Port or other parties pay for the cleanup action selected by Ecology, but these factors do not affect Ecology's alternatives analysis under the MTCA regulations.

**Comment**: A number of commenters expressed a desire to conduct additional cleanup and habitat actions above-and-beyond the MTCA-required cleanup. Some commenters expressed the opinion that Bellingham taxpayers would be in favor of additional property taxes to pay for additional cleanup. Others expressed their personal willingness to pay more in taxes to fund the cleanup. Some commenters wanted to modify the criteria under which MTCA grant funds are allocated under the Local Toxics Account grant program, either to increase funding for the project, or alternately to decrease funding for specific project elements (e.g., ASB cleanout). Other commenters requested that the Port and Ecology pursue additional funding sources to support more cleanup and habitat enhancement work in Bellingham Bay.

*(Refer to Commenters #12, 15, 35, 87, 109, 110, 114, 122, 137, 142, 154, 155)*

Response: The citizens of Bellingham, public interest groups or other parties can work with the Port and other stakeholders to fund cleanup or habitat restoration actions beyond those required as part of Ecology's regulatory cleanup decision. However, Ecology cannot compel such actions under its MTCA authority. The question of property tax use is appropriately left to the voters and their elected representatives. Allocation of the MTCA Local Toxics Account grant funds are based on state regulations. Bellingham Bay is a high priority for Ecology and 11 waterfront cleanup sites are currently in various stages of the cleanup process. In addition, under the Bellingham Bay Demonstration Pilot, Ecology, the Port, and a number of other federal, state, local, and tribal entities, continue to coordinate and further cleanup and habitat restoration efforts in Bellingham Bay. For example: Ecology, DNR, PSAT and Whatcom County Public Works are funding partners in an effort to address wood debris at Cliffside Beach; this year DNR removed abandoned creosoted pilings from Bellingham Bay;Ecology continues to fund an eel grass seeding test project in the GP Log Pond; and, it is Ecology's understanding that the Port intends to construct habitat enhancements as part of their cleanup and redevelopment activities.

**Comment**: Several commenters expressed concern about the costs of cleanup and the potential impact on their property taxes, or supported the selection of alternatives that do not result in additional property taxes. Other commenters emphasized the need to support cleanup actions that have a viable funding plan already defined.

*(Refer to Commenters #37, 52, 55, 106, 113 & 156)*

Response: As described above, Ecology's pending decision about the MTCA cleanup of the Whatcom Waterway site is based on regulatory requirements. The funding of a cleanup action is the responsibility of the potentially liable parties, including the Port of Bellingham. The question of property taxation levels and the use of collected taxes is appropriately left to the voters and their elected representatives.

5.27 Comments on Design & Permitting

**Comment**: One commenter stated the opinion that cleanup permitting should be conducted separately from permitting for waterfront reuse, arguing that the ASB should be cleaned out prior to any consideration of potential future uses for the structure.

*(Refer to Commenter #7)*

Response: The Port is responsible for obtaining all permits required for conducting the cleanup. Final permitting decisions will be made by the agencies responsible for project permits. Federal permitting agencies like the Corps of Engineers may require cleanup and development actions that comprise an integrated project be permitted together as one project, under one permit, so that the agency's ability to evaluate project impacts is not unduly restricted. Ecology does not have authority to alter or amend federal regulations or policy with regard to how federal permits are granted. The MTCA cleanup of the Site is based upon ensuring protection of human health and the environment under specific land and navigation uses. The Port of Bellingham, the current owner of the ASB, has informed Ecology that it plans to open the ASB to Bellingham Bay and develop a Clean Ocean Marina including public shoreline access and habitat enhancements. Ecology's regulatory responsibility under the MTCA is to implement a cleanup action that is protective given this use scenario. Comments regarding land use cannot be addressed by Ecology within the scope of the Site cleanup and should be directed to the City and Port as part of their on-going land use planning initiatives.

**Comment**: Several commenters requested that the design and permitting process for the cleanup action be subject to public and stakeholder review.

*(Refer to Commenters #66, 116 & 150)*

Response: Although public review of the Engineering Design Report is not required under MTCA regulations, due to these comments Ecology intends to include a public comment period as part of the remedial design process for the Site. Additional public notice and opportunities to comment are also included in the Corps of Engineers permitting process.

**Comment**: One commenter expressed the desire that the design and permitting process can move ahead as expeditiously as possible so that the cleanup work can be completed sooner, rather than later.

*(Refer to Commenters #104)*

Response: Ecology shares the desire to move forward expeditiously with the design, permitting and cleanup of the Site.

5.28 Institutional Controls

**Comment**: Several commenters stated their belief that institutional controls would not be required for the filled ASB area if the cleanup action was performed using Alternative 3.

*(Refer to Commenters 7, 35, 109)*

Response: Based on the types and concentrations of contaminants in sediments that are present in or that would be disposed in the ASB under Alternative 3, Ecology concludes that institutional controls would be a required element of this alternative to ensure potential groundwater and vapor exposure pathways are controlled in perpetuity. Institutional controls are an aspect of all of the RI/FS alternatives.

**Comment**: Other commenters expressed concern about the effectiveness of institutional controls for sediments in a navigable waterway, and stated that institutional controls are more effective at confined disposal facilities. Commenters expressed concerns that controls such as speed limits for boaters to minimize wakes may not be realistic and that these risks should be taken into account in the evaluation of remedial alternatives. One commenter was skeptical that information regarding the cleanup could be communicated to future property owners or others proposing waterfront construction.

*(Refer to Commenters 12, 109 & 122)*

Response: Ecology agrees that institutional controls must be used in conjunction with other measures (e.g. appropriate engineering design and potential physical restrictions) to provide for long-term stability of capped sediment areas. Ecology believes that institutional controls can be highly effective at transmitting information on the presence of capped contaminated materials, and in communicating to regulatory agencies responsible for permitting construction projects (e.g., navigation dredging) the need to review construction practices that could disturb capped contaminated materials. Restrictive covenants will be filed with the County and tracked by the State of Washington Department of Natural Resources as part of the final cleanup action and will “run with the land”. However, institutional controls must be combined with engineering controls (e.g., thick caps, appropriate water depths, armor layers) to provide the appropriate level of overall protectiveness that Ecology expects. Ecology is considering these issues as part of its cleanup decision for the Site.

## 5.29 Recontamination Risks

**Comment**: Two commenters expressed the opinion that cleanup should be deferred until after completion of final cleanups at contaminated sites located adjacent to the Whatcom Waterway.

*(Refer to Commenters #7 & 35)*

Response: The RI/FS describes the source control evaluations that have been conducted at the adjacent Chlor-Alkali Plant site and Central Waterfront site. While final cleanup of these upland sites has not been completed, the sites have been studied as part of on-going RI/FS activities. Groundwater evaluations have been performed at both sites indicating that the sites do not present an ongoing recontamination concern for the Whatcom Waterway sediments. Monitoring within the Log Pond has demonstrated that groundwater sources of contamination to the Log Pond are sufficiently controlled to prevent surface water quality impacts or sediment recontamination. Tissue monitoring for crabs within and near the Log Pond has demonstrated that seafood mercury levels are low and are declining. Since there is no evidence that these other sites are adversely impacting the Site there is no reason to delay cleanup. The cleanup of the Central Waterfront site, however, will be coordinated with the cleanup of this Site since contaminated surface sediments comprising part of the Central Waterfront site overlay contaminated subsurface sediments at this Site in one area of the Waterway.

**Comment**: One commenter expressed concern about potential recontamination of the Site due to stormwater discharges or other contamination events, and argued that capping was therefore not an appropriate cleanup remedy for the Whatcom Waterway.

*(Refer to Commenter #7)*

Response: Recontamination through stormwater discharges is a concern for all types of sediment cleanup, including dredging, capping and natural recovery remedies. Information reviewed, collected and compiled during the RI/FS indicates that stormwater is not a significant source of recontamination to Site sediments. Ecology will require monitoring of sediment near significant stormwater discharge locations as part of long-term monitoring. Also see recontamination response above.

5.30 Future Changes in Cleanup Standards

**Comment**: Several commenters expressed concern that cleanup standards may change over time, resulting in additional future requirements for sediment cleanup. Generally these comments were articulated along with a proposal to reduce this risk through additional sediment removal actions.

*(Refer to Comments #46, 73, 74, 88, 105, 125, 133)*

Response: Ecology is required to make its cleanup decisions based on the current regulations and the best available information at the time of its cleanup decision. Cleanup levels applicable to the Site are documented as part of Ecology’s cleanup decision, articulated in the Consent Decree. These cleanup levels will not be affected by minor adjustments to state numeric criteria. However, Ecology retains its authority under the Consent Decree to require additional actions if new information indicates that there is a threat to human health and the environment and that the original cleanup standards are not adequately protective. This type of “reopener” to the Consent Decree could apply to any completed remedy, whether completed by dredging, capping or other techniques. Therefore, the reopener risk is not specific to any one remedial alternative. As a practical matter, the natural recovery processes known to occur at the Site will tend to further reduce contaminant concentrations in sediments over time, improving overall protectiveness over time and reducing the potential for future reopeners to Ecology's cleanup decision due to potential future changes in cleanup standards should such changes occur.

5.31 Polling Data and Petitions

**Comment**: One commenter (the Bellingham Bay Foundation) submitted a copy of an initiative developed by the organization and a resolution and set of principles prepared by the board of directors of the organization. The organization also submitted copies of public opinion polls performed by two different contract polling companies on behalf of the organization and an additional petition completed by the organization.

*(Refer to Comment #12)*

Response: Specific concerns and technical issues raised in the materials and relating to the current RI/FS and EIS documents or the cleanup of the Site are addressed in several areas of this Responsiveness Summary.

# 6. DSEIS Comments and Responses

## 6.1 Scope of the DSEIS

**Comment:** One commenter posed several questions related to the scope of the SEPA DSEIS document. The commenter recommended that the analysis be updated to include analysis against National Environmental Policy Act (NEPA) criteria and federal permitting criteria, in addition to the SEPA criteria. Specifically the letter requested review of tribal treaty rights issues, cumulative effects of historical waterfront development and environmental justice issues.

*(Refer to Commenter #87)*

Response: SEPA is a state law requiring state and local agencies to analyze the environmental impact of projects they permit or perform. As discussed in the DSEIS, the document is supplemental to the previous Bellingham Bay Pilot Comprehensive Strategy EIS. The original EIS addressed the SEPA criteria, consistent with EIS Scoping and the decisions of the Bellingham Bay Pilot Work Group.

NEPA is a federal law that requires federal agencies to analyze the environmental impacts of projects they permit or perform; NEPA does not apply to state or local agencies. Analysis of NEPA or federal permitting agency criteria was beyond the scope of the 2000 EIS, and remains so as part of the current Supplemental EIS. As discussed in the DSEIS, these additional criteria will be addressed as part of the environmental reviews conducted by the federal government as part of the federal permitting required for the project.

**Comment:** One commenter requested that the DSEIS evaluate the project in comparison to Bellingham Bay conditions from 1859 rather than using current conditions at the time the DSEIS was prepared. This commenter provided several related comments requesting that the baseline conditions referenced in the DSEIS be defined as the habitat conditions, Site uses and fisheries resources prevailing historically, as opposed to those observed at the Site at the time the DSEIS was prepared.

*(Refer to Commenter #87)*

Response: The current DSEIS evaluates the cleanup of the Site against current conditions, consistent with the intent of a No Action alternative under SEPA. A historical analysis of patterns of waterfront development over the past 148 years or an analysis of the change in relative abundance of fisheries resources over that time period is beyond the scope of the current project or SEPA requirements.

## 6.2 Identity of SEPA Official

**Comment:** One commenter expressed concern that a Port of Bellingham staff member was designated as the SEPA official for the DSEIS and that this might represent a conflict of interest.

*(Refer to Commenter #35)*

Response: As discussed in the DSEIS and in the Ecology Fact Sheet, the SEPA official for the DSEIS is Steven Alexander of the Department of Ecology, not a Port of Bellingham staff member. The Department of Ecology is the agency responsible for SEPA compliance for the cleanup of the Whatcom Waterway Site. In regards to land use issues, Ecology understands that the Port of Bellingham is the agency responsible for SEPA compliance for the proposed Master Plan for the New Whatcom Special Development Area.

## 6.3 Property Ownership

**Comment:** Three commenters questioned the ownership of the former GP properties, stating that the properties are owned by “the public” rather than the Port of Bellingham.

*(Refer to Commenters #12, 35 & 115)*

Response: As a matter of public record, the former GP properties acquired by the Port are legally owned by the Port of Bellingham, which is a municipal corporation. The statements in the document are intended to be factual regarding legal ownership, and are not intended as a comment on broader issues about the mission of the Port and its projects, or the relationship of the Port to Whatcom County citizens, voters or taxpayers.

## 6.4 Recent Habitat Studies

**Comment:** One commenter requested inclusion of citations to three recent studies, including two related to salmonid use in Bellingham Bay and one additional study related to behavior of salmon in the vicinity of active ferry terminals.

*(Refer to Commenter # 150)*

Response: These additional documents will be referenced in the final SEIS. The documents include *Inner Bellingham Bay Juvenile Chinook Study Lummi Natural Resources Data Report* (2005); NOAA Fisheries *2003 Bellingham Bay Juvenile Chinook Townetting Project Field Sampling and Data Summary* (2004); and *Impacts of Ferry Terminals on Juvenile Salmon Migrating Along Puget Sound Shorelines, Phase 1: Synthesis of State of Knowledge* (1999).

## 6.5 Eel Grass Comments

**Comment:** The Department of Fish and Wildlife requested that an updated inventory of the eelgrass habitats within the Site be completed, given the time that has elapsed since the previous eel grass survey conducted under the Bellingham Bay Demonstration Pilot. The agency also stated that the optimal elevations for eel grass development in Bellingham Bay are typically between 0.0 and -8.0 feet relative to mean lower low water (MLLW), and that eel grass would not be expected to colonize areas shallower or deeper than these elevations.

*(Refer to Commenter # 150)*

Response: An updated eel grass survey will be performed as part of remedial design and permitting activities for the project. The comments about optimal eel grass elevations are noted. Habitat benches constructed in these or other locations of the project area may include a range of elevations, with different vegetation likely in these different zones. For example, salt-marsh vegetation is likely at the upper edge of the intertidal zone, with macro-algae present in rocky areas of the intertidal zone, and eel grass in lower areas with appropriate substrate and wave energy characteristics.

## 6.6 Land Use Changes

**Comment:** Numerous commenters expressed general support for the waterfront revitalization efforts and land use changes being led by the Port and City.

*(Refer to Commenters #18, 29, 31, 32, 47, 59, 99, 103, 112, 113, 127, 151 & 157)*

Response: Ecology's role under the MTCA is to ensure protection of human health and the environment given current and planned land and navigation uses. Comments regarding land use changes cannot be addressed by Ecology within the scope of the Site cleanup and should be directed to the City and Port as part of their on-going land use planning initiatives.

**Comment:** Additional commenters emphasized that the land use changes occurring as part of the change to mixed-use zoning provide economic opportunities to the community. These commenters were generally supportive of the waterfront revitalization efforts.

*(Refer to Commenters #29, 103, 127 & 157)*

Response: See above response.

**Comment:** One commenter stated disagreement with the change in land use from industrial to mixed-use development taking place on Bellingham's waterfront. The commenter stated that the Port and GP properties should instead be developed into a container terminal.

*(Refer to Commenter #14)*

Response: See above response.

6.7 Navigation Channel Changes

**Comment:** Multiple commenters expressed support for the conversion of the historical industrial channel in the Inner Whatcom Waterway to a locally-managed multi-purpose channel. These comments were made by commenters favoring different cleanup alternatives.

*(Refer to Commenters #7, 28, 47, 51, 59, 113, 140, 151, 154 & 157)*

Response: Ecology's role under the MTCA is to ensure protection of human health and the environment given current and planned land and navigation uses. The Port is the local sponsor for the federal channel maintenance program in Bellingham. The Port informed Ecology that it has passed a resolution supporting the deauthorization of the federal channel in the inner portion of the Whatcom Waterway, to provide for multi-purpose uses of this area. The DSEIS evaluates the impacts of the cleanup alternatives, and potential mitigation measures, given this planned use.

**Comment:** Three commenters stated specific support for continuation of deep draft navigation uses at Bellingham Shipping Terminal. These commenters included the Port of Bellingham.

*(Refer to Commenters #51, 113 & 149)*

Response: Most of the alternatives evaluated are protective given this existing and planned deep draft use at the Bellingham Shipping Terminal.

**Comment:** One commenter stated disagreement with the Port's decision to convert the Inner portion of the Whatcom Waterway from a federally-managed industrial channel to a locally-managed multi-purpose channel.

*(Refer to Commenter #14)*

Response: As noted above, Ecology's role under the MTCA is to ensure protection of human health and the environment given current and planned land and navigation uses. The Port is the local sponsor for the federal channel maintenance program in Bellingham. The Port informed Ecology that it has passed a resolution supporting the deauthorization of the federal channel in the inner portion of the Whatcom Waterway, to provide for multi-purpose uses of this area. Comments regarding navigational use changes should be directed to the Port.

### 6.8 Marina Comments

**Comment:** Twenty commenters provided comments supporting the Port's proposal for future use of the ASB as a marina. Some commenters emphasized the economic benefits that a marina may provide to the community. Others emphasized the role of the marina in satisfying community moorage demand. Several commenters emphasized that the conceptual design for the marina will provide significant enhancement of nearshore habitat for juvenile salmonids, and will also provide public shoreline access opportunities for the community.

*(Refer to Commenters #13, 21, 22, 31, 32, 34, 39, 77, 99, 103, 111, 112, 113, 130, 133, 146, 147, 149, 152 & 157)*

Response: Ecology's role under the MTCA is to ensure protection of human health and the environment given current and planned land and navigation uses. The Port, as the owner of the ASB area of the Site, has informed Ecology that they plan to develop a Clean Ocean Marina, with associated public access and habitat enhancements, within the ASB. The DSEIS evaluates the impacts of a range of cleanup alternatives, and potential mitigation measures, given this planned use. Comments regarding this change in use cannot be addressed by Ecology within the scope of the Site cleanup and should be directed to the City and Port as part of their on-going land use planning initiatives.

**Comment:** Eleven commenters voiced opposition to the Port's stated objective of developing a marina within the ASB. Some of the commenters argued that the ASB structure should instead be removed and the area used for habitat development. Others argued that the ASB should be filled (as in RI/FS Alternative 3) and used for park or high-rise residential development. One commenter stated that a new larger marina basin should be built elsewhere (between Boulevard Park and Fairhaven) and the ASB retained for industrial wastewater treatment uses. Another commenter questioned the need for a new marina and argued that dry stack storage could be used to meet boat storage demand.

*(Refer to Commenters #12, 15, 35, 41, 69, 75, 78, 80, 139, 156 & 159)*

Response: See above response.

**Comment:** One commenter who also supported the Port's plan to build a marina stated a desire for storage and launching facilities to be developed in the Whatcom Waterway area for small boats (i.e., less than 18 feet).

*(Refer to Commenter #77)*

Response: See above response.

### 6.9 Alternative ASB Uses

**Comment:** Eight commenters stated a preference for the ASB area to be reused in part or in full for aquatic habitat. One commenter was in favor of a modification of RI/FS Alternative 3 in which a portion of the ASB not filled with dredged material would be opened up as aquatic habitat. The other commenters stated that the ASB should be removed and the area restored for aquatic habitat.

*(Refer to Commenters #15, 28, 80, 87, 122, 123, 124 & 159)*

Response: See above response.

**Comment:** Four commenters stated a preference for upland reuse of the ASB. Three of the commenters desired the development of a large park on the filled ASB. One commenter stated that the filled ASB should be reused for high-rise residential development.

*(Refer to Commenters #12, 15, 35 & 139)*

Response: See above response.

**Comment:** One commenter stated a preference for the ASB to continue in use for treatment of industrial wastewater.

*(Refer to Commenter #75)*

Response: See above response.

6.10 Habitat Backfill in Waterway

**Comment:** Eight commenters stated support for deep dredging of the Inner Whatcom Waterway, followed by backfilling the area with clean sediment to restore shallow-water habitat along the waterway edges.

*(Refer to Commenters #15, 28, 33, 35, 46, 109, 110, 122, 142)*

Response: If deep dredging of the Inner Whatcom Waterway is conducted exclusively for cleanup, and if there is no intent to use the area for deep draft navigation or to maintain the area as part of the federal navigation channel, then backfilling of the area with clean material to restore more gradual sideslopes could be conducted in order to mitigate some of the land use and habitat impacts associated with the deep dredging. Bulkheads would still be required to ensure stability of the shoreline during dredging, and these costs would need to be added to the cleanup cost referenced in the RI/FS (i.e., because the costs of the bulkheads are not carried by a separate navigation or development project as they would be if the area was to be used for deep draft navigation). The temporary bulkheading and sideslope backfill would serve as required mitigation for geologic issues, though addition of the sideslopes may exceed the mitigation measures that could reasonably be required as part of cleanup. The ability to mitigate habitat impacts would potentially be significant to Alternative 8 or to Alternative 3 which have less net gain of habitat than Alternatives 2 and 7. Adding sideslopes as habitat mitigation would likely exceed the mitigation measures that could reasonably be required under Alternatives 2 and 7 due to the net habitat benefits already incorporated in these alternatives.

### 6.11 Comprehensive Strategy Updates

**Comment:** One commenter stated that updating of the Comprehensive Strategy may be appropriate to address new information relating to natural resources and surface water circulation patterns in Bellingham Bay.

*(Refer to Commenter #117)*

Response: Ecology is considering performing an update to the Comprehensive Strategy, after finalization of ongoing local land use planning efforts. Ecology is also continuing in its role as a coordinating agency to make Bellingham Bay Pilot information available to agencies and stakeholders involved with cleanup, source control and habitat restoration efforts around Puget Sound.

### 6.12 Pilot Goals

**Comment:** Several commenters referenced the Pilot Goals statements in their comment letters. Two commenters discussed Goal 6: "Faster Better Cheaper", and argued that the RI/FS preferred alternatives should not have scored as highly against this goal because they were faster and cheaper, but the commenters argued that the alternatives were not necessarily better. A third commenter stated appreciation that the DSEIS included an evaluation against the Pilot Goals, but did not provide specific comments on the evaluation performed in the DSEIS.

*(Refer to Commenters 7, 12, 29)*

Response: The Pilot analysis of alternatives summarized in Section 5 of the DSEIS is not a regulatory requirement and will not be used for regulatory decisions. Consistency with the Pilot Goals is voluntary and the analysis simply provides an additional basis by which the qualitative benefits or short-comings of a remedial alternative can be measured. The differences of opinion stated by the first two commenters are noted.

### 6.13 Specific Edits

**Comment:** Several specific updates to the text in Section 3 of the DSEIS were requested by one commenter. First, the commenter requested that the text be clarified to emphasize that the final decision on whether to remove the Bald Eagle from the federal list of threatened and endangered species has not been made, and that the Bald Eagle is still protected by the ESA regulations. Second, the commenter requested that the text be updated to clarify that the Peregrine falcon has been delisted under the ESA regulations. Third, the commenter requested that the discussion of the Nooksack River watershed be updated to reference the 303(d) listings of the Lower Nooksack River for fecal coliform. The commenter also requested that Lake Whatcom be listed under the Whatcom Creek watershed and not the Nooksack River watershed, presumably because the inflows to Lake Whatcom are induced by the City water supply project (i.e., diversion dam on the Middle Fork of the Nooksack) rather than from natural surface water flow.

*(Refer to Commenter 87)*

Response: Text edits to the DSEIS will be made to address the issues noted.

# RESPONSIVENESS SUMMARY
APPENDIX A

Commenter No. Name / Organization
1 Almskaar, Roger

Commenter Submittals:
A E-mail Dated Dec. 17, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preference | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Dredging residuals & water quality | Inability to remove all mercury | 5.16 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Roger Almskaar [mailto:almskaarr@comcast.net]
**Sent:** Sunday, December 17, 2006 5:29 PM
**To:** McInerney, Lucy (ECY)
**Cc:** Port of Bellingham
**Subject:** Whatcom Waterway Cleanup

Dear Ms McInerney, please enter the following comments in the record. I have reviewed the info in your 11 page summary dated Oct 2006, and have been following the issue in the local media. As a professional in the land use/shoreline management field in NW Washington for over 30 years, it is obvious to me that your agency has done a very thorough and rational analysis of this complex and important issue.

I support your findings as to the preferred alternatives being # 5 and 6. The summary and it's tables # 2, 3 and 4 show that these are the best choices from a reasonable and broad minded community and state point of view. It is essential to look at the costs of expensive publicly funded programs, and not just the benefits, as some would have it. 1

Some well organized and funded local activists have supported a total removal of mercury, at a very high cost to the community. It appears they are still trying to kill the new marina proposal by making it too expensive. Further, as has been said by more knowledgeable people, there can be no warranty that all the mercury will be removed, no matter how it is attempted, or that no significant adverse short or long term impacts won't result. Everyone wants a clean bay, but we must approach the issue and select a solution based on facts and reason, not some of the facts and an appeal to emotions. 2

Sincerely, Roger Almskaar, 233 S State St, Bellingham WA 98225

Commenter No. Name / Organization
2 Ambrose, Peter

Commenter Submittals:
A E-mail dated Dec. 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preference | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Ambrose, Peter M., M.D. [mailto:pmambrose@hinet.org]
**Sent:** Thursday, December 14, 2006 7:40 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/eis Public input

Dear Ms McInerney,

I am a resident of Whatcom County and have use Bellingham bay for 32 years. Having reviewed the Draft RI/Eis documents for the Whatcom Waterway Site,I feel alternatives 5 and 6 are the best choices in their current forms. Thank you for your hard work. Sincerely, Peter Ambrose MD 1

Commenter No. | Name / Organization
---|---
3 | Anderson, Ken

Commenter Submittals:

A Letter dated Dec 11, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preference | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

1

RECEIVED

DEC 11 2006

DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

6605 Lunde Road
Everson, WA 98247
E-mail kandianderson@nas.com
Phone: 360-398-8322
December 11, 2006

To Whom It May Concern:

If your still open to suggestions on ways to unload soil dredged from the Whatcom waterway, I hope you will consider this letter carefully. By doing so you may help save the Port many millions of dollars.

Dredging the fill from the Whatcom Waterway is a problem because there appears no economical way to get rid of the material. Neither barges nor rail offer cheap solutions and there are no large sediment basins nearby to receive the stuff. Dumping at sea is a definite no-no.

As a last resort, the material could be pumped over the dike and into the sludge pond. But that would mean that it would burry and mix with much more contaminated material. That would require the slightly contaminated waterway material to be dried and shipped to distant deposit sites along with the contaminated pond sludge. So that is not a good answer either.

I am proposing that the waterway material be used to provide a base for a large beachfront area west of the sludge pond. The three enclosed sketches will give you some idea of what I have in mind. 2

Drawing 1 shows the plan view. At nine acres the recreation area is probably larger than it will be, but it does show the concept.

Drawing 2 shows the side view of the area from the sludge pond to the end of the project at the sheet pile wall.

Drawing 3 shows a detail of that side view at the sheet pile wall.

Sequence of construction would take place as follows:

1. The sheet piles would be driven on the previously determined line. Since they would be permanently exposed to the sea, they should be treated to keep in good shape.

2. The waterway soil would be dredged and pumped into the area behind the wall. The wall would stop the seaward flow of that material and any harmful properties it might have.

3. After the waterway soil was in place, it would be graded and compacted at low tides.

4. Then the clean sand or gravel would be brought in to cover the waterway fill. It would provide protective cover up to the level of the top of the sheet pile wall at the west end. The addition of this clean material would complete the construction.

On the positive side of this suggestion we have these ideas going for it:

1. We would have found a cheap and convenient place to dispose of the waterway fill.

2. A large area of prime beachfront would become available to the Port. With clever design by others, this would be a huge benefit, worth many millions.

3. We would have developed competition between the railroad and barges for transportation of the sludge from the pond. If the decision is made to export the pond's sludge by barge, the area developed could be used temporally for processing that sludge. Presently, processing areas are very tight. The railroad then would no longer have such a corner on the sludge exporting market. This factor could result in a substantial savings to the Port.

These big negatives come to mind, and others may think of more:

1. The area developed would not come cheap. The cost to buy and drive the sheet piles would be a big consideration. An estimate could be worked up on those figures, as well as other construction costs.

2. The area would not be accessible to boats. That sheet pile wall would be a permanent fixture that tears up their bottoms. So a liberal use of warning buoys would be required. I believe, however, that some good suggestions from others would take care of the worst of this idea.

3. All, not just a part of the waterway fill would have to be taken. Taking a part would leave the same old disposal problem with the remainder. This would mean that the estimated cubic yardage of waterway fill should not be low. If it were low the remainder of the fill required would be much more expensive.

4. Time will be required to develop plans for this proposal and to drive the sheet pile wall. In the meantime the waterway material just sits there tying up any proposed benefit for a couple years or more. This could be a big political negative since we have a public that is already impatient for results. But aren't the benefits worth the wait?

5. It may be difficult for good people who have spent many hours working on solutions to a problem to accept new suggestions from the outside. The natural reaction is to try to put a polish on the original thoughts. I appreciate that. But such a position could neglect the chance to save the Port a great deal of money.

A logical approach would be to consider the positives and negatives closely and carefully estimate their values. Please make your decisions by considering the benefits for the Port from this time forward. I would be pleased to work with you toward that goal.

Thank you for your consideration.

Very truly yours,

3 drawings enclosed

Ken Anderson

Ken Anderson, P.E.

rcvd 10/26/06

# A VERY PRELIMINARY FLOW DIAGRAM FOR ASB SLUDGE REMOVAL 10-26-06

By Ken L. Anderson P.E. - 398 - 8322

6605 Lunde Rd.
Everson 98247

Physical properties of sludge are presented by lab.

Arrangements are made for barges and disposal of sludge.

Piping system's properties and locations are called out.

Material to be removed from ASB is clearly defined in the dredging contract.

A maximum moisture-content level for material to be barged away is determined.

Measurement and payment of dredge material is clearly defined.

Documents are prepared and a contract made for the construction of storage facilities.

Documents are prepared and a contract made for the construction of land-based barge facilities.

Piping system is removed by contract where necessary.

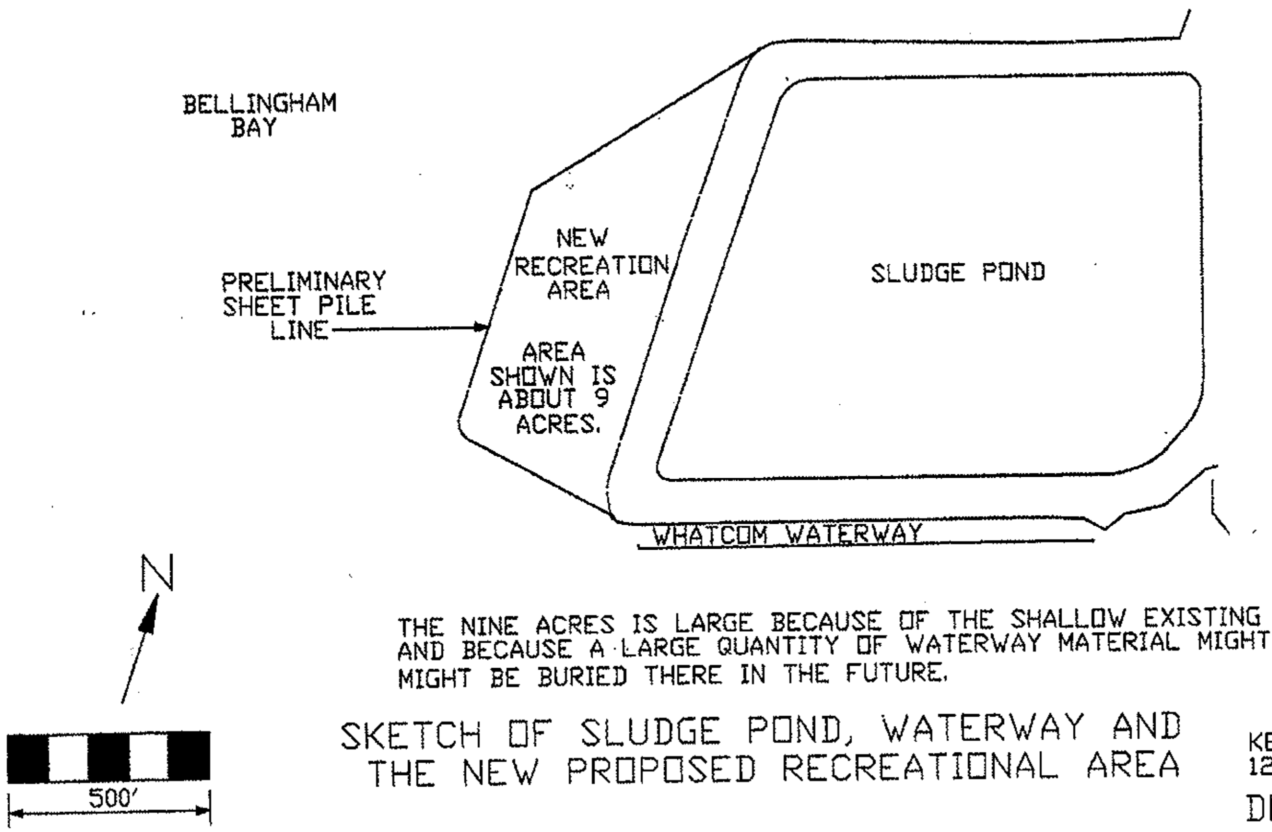
Storage facilities are constructed

Land-based barge facilities are constructed.

A decision is made regarding the breakdown of future contracts covering the material dredging, draining, drying and shipping. Contract documents are prepared accordingly.

Contractors move in, dredge, drain, dry and ship the material to the disposal area

Following removal of sludge material, other contractors modify the area according to drawings prepared for the Port.

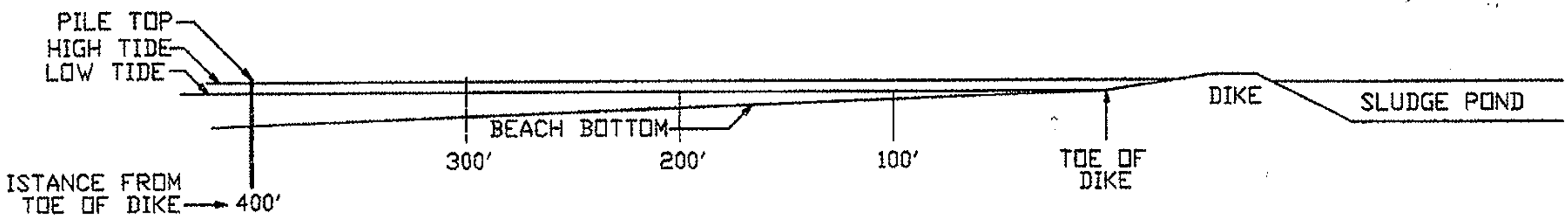



THE NINE ACRES IS LARGE BECAUSE OF THE SHALLOW EXISTING BEACH AND BECAUSE A LARGE QUANTITY OF WATERWAY MATERIAL MIGHT BE MIGHT BE BURIED THERE IN THE FUTURE.

SKETCH OF SLUDGE POND, WATERWAY AND THE NEW PROPOSED RECREATIONAL AREA

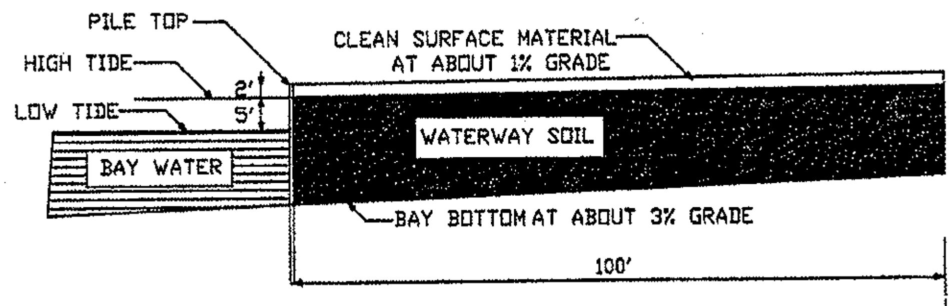
KEN ANDERSON P.E.
12-10-06

DRAWING 1




3EACH AFTER SHEET PILES ARE DRIVEN AT 400' BUT BEFORE FILL BEGINS.

KEN ANDERSON P.E.
12-10-06
DRAWING 2




THE PILE IN THE SECTION SHOWN IS ABOUT 400' FROM THE DIKE'S TOE OF SLOPE.

A 30' SHEET PILE IS SHOWN BUT LENGTHS WILL VARY WITH CONDITIONS.

CONDITIONS SHOWN ARE AT LOW TIDE UPON COMPLETION OF WORK.

# SECTION OF PROPOSED SHEET PILE WALL

KEN ANDERSON, P.E.
12-10-06

DRAWING 3

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT

PRODUCED BY AN AUTO ...K EDUCATIONAL PRODUCT

| Commenter No. | Name / Organization |
|---|---|
| 4 | Anderson, Richard |

Commenter Submittals:

| | |
|---|---|
| A | Letter dated Dec 12, 2006 |
| B | E-mail dated Dec 18, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Log Pond | Concerns about capping | 5.14 |
| 2 | FS | Capping costs | Contingent remedies & repairs | 5.12 |
| 3 | FS | Remedy preference | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | FS | Remedy preference | Specific remedy preferences | 5.1 & Table 5-1 |
| 5 | FS | Capping concerns | General concerns | 5.2 |
| 6 | FS | Remedy preference | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

December 12, 2006 2

To: Lucy McInerney, Washington State Department of Ecology
SUBJECT: Whatcom Waterway Cleanup Alternatives

Dear Ms. McInerney,
I am writing to express my concerns regarding the Department of Ecology's pending decision regarding the cleanup of Whatcom Waterway. I am greatly concerned that it appears likely that a shortsighted approach to save current dollars may be taken. That quite very will result in a much greater public cost in the long term.

Further, I am concerned that your agency is being pressured to make a decision that is for the convenience of the Port of Bellingham's desire to build a marina in the ASB. I am not advocating for or against a marina.....I am advocating for a proper and, most importantly, permanent cleanup be carried out.

I view the capping of the GP log pond to be a significant indication of the fallacy of only capping 1
the contaminated sediment in Whatcom Waterway. If after only 5 years that "experiment" is
already deemed to be failing how can we expect any better success with the capping of the entire
waterway? If the Waterway capping should fail, the cost of future remediation would be 2
major.....to say nothing of the danger to our environment and citizens.

Alternatives 3 and 7 provide for full cleanup of Whatcom Waterway. The Department of
Ecology should require that one of these alternatives be carried out. Anything less bears
unacceptable long term risk. Let the Port of Bellingham decide whether the marina or cost 3
savings is of more importance to them. But do not allow Alternative 6 to proceed as it does not
provide a permanent solution. Indeed, even Alternative 7 will very likely prove to be less costly
in the long term than Alternative 6.

Please insure that the cleanup of Whatcom Waterway is thorough, absolute and complete. FOREVER. To do any less would be a great disservice to the Citizens of Bellingham, Whatcom County and to all future generations. Require the Port of Bellingham to proceed with either Alternative 3 or Alternative 7.

Sincerely,

Richard L. Anderson
4219 Adams Avenue
Bellingham, WA 98229
360-650-1587
rick@gardenarches.com

#4-B

-----Original Message-----
From: Garden Arches [mailto:rick@gardenarches.com]
Sent: Monday, December 18, 2006 5:11 PM
To: McInerney, Lucy (ECY)
Subject: Whatcom Waterway Cleanup

I am not a scientist, but after reading the information posted on your website and watching the public presentations and hearings, the right solution to cleaning up the contaminants in Whatcom Waterway is very clear.

Capping the contamination is not what is right for the citizens......it 4
assumes significant ongoing expense to monitor and provides no real assurance of being a long term solution. Failure of the capping could create ongoing risks to people and the ecosystem. In the long run,
capping will likely prove to be the most costly of the solutions. 5

The Department of Ecology is creating solutions that cater primarily to the Port of Bellingham who, even though they are a public entity, do not represent the best interests of the Citizens of Bellingham and Whatcom County. The only logical cleanup process is to remove all contaminants to
an appropriate disposal site. Whatcom Waterway and the ASB are NOT appropriate disposal sites.

6

To allow capping to proceed would be a tragic mistake. I urge you to require complete cleanup of both Whatcom Waterway and the ASB. Anything short of that would be a great disservice.

Sincerely,
Richard L. Anderson
4219 Adams Ave.
Bellingham, WA 98229

Commenter No. Name / Organization
5 AquaBlock

Commenter Submittals:
A Letter dated Dec 1, 2006 John Collins (General Manager)

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Capping details | AquaBlock product uses | 5.8 |
| 2 | FS | Capping details | AquaBlock product uses | 5.8 |
| 3 | FS | Capping details | AquaBlock product uses | 5.8 |
| 4 | FS | Capping details | AquaBlock case study | 5.8 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

AquaBlok
Composite Particle System

#5-A

**AquaBlok, Ltd.**

3401 Glendale Avenue
Suite 300
Toledo Ohio 43614

Phone: (800) 688-2649
Fax (419) 385-2990

E-mail Address:
services@aquablokinfo com

Website Address:
www aquablokinfo com

December 1, 2006

Mark Larsen, Senior Project Engineer
Jamie Stevens, Environmental Engineer
Grant Hainsworth, P.E.
RETEC Group, Inc.
1011 SW Klickitat Way, Suite 207
Seattle, Washington 98134-1162

Lucille T. McInerney, P.E.
Site Manager Department of Ecology
3190 160th Avenue
Bellevue, Washington 98008-5452

RE: Whatcom Waterway Site Draft RI/FS – RETEC Project PORTB-18876; AQB105 100 0032.DOC

Dear Madam and Sirs:

Based on our review of the subject document, we feel compelled to comment on two specific sections dealing with issues associated with the capping alternative in general and more specifically with the use of AquaBlok as a potential capping material 1

By way of introduction, AquaBlok represents a "thin" capping alternative or compliment to sand or other granular products which offers a number of important benefits over conventional (2-5' thick) sand alone capping approaches. It is important to note that the EPA's December 2005 guidance document for sediments (Contaminated Sediment Remediation Guidance for Hazardous Wastes – EPA-540-R-05-012) recognized AquaBlok specifically as follows:

> *"Specialized materials may be used to enhance the chemical isolation capacity or otherwise decrease the thickness of caps compared to sand caps. Examples include engineered clay aggregate materials (e.g , AquaBlok®)."*



In your report, section 5.31. Sediment Capping, the discussion of In Situ Capping does not consider such specialized materials. Specifically, the report states: "In Situ caps are generally constructed using granular material, such as clean sediment, sand, or gravel. Composite caps can include different types of multiple layers of granular material, along with geotextile or geomembrane liners." Reactive caps are defined in the report as "can include the addition of contaminant-sorbing or blocking materials." It is important to point out that AquaBlok can be utilized as simply an inert, low permeability barrier/cap without the addition of treatment materials that provide the ability of AquaBlok to function as a "Reactive Cap". 2

In addition, as a clay-aggregate composite, a freshwater AquaBlok based cap can be very stable and generally will utilize its internal aggregate as an armoring system to provide improved resistance erosive forces, compared with sand or gravel alone.

In addition to the above, you should be aware that AquaBlok is available in a formulation that
may provide the same low permeability capping capacity in a saline environment. Although we
have worked with RETEC, Inc on the installation of AquaBlok materials in the past, these have
been in freshwater environments. As a result, your specific reference to AquaBlok as a product 3
in the report in section 5.7.2 Reactive Caps on page 5-37 is not correct. For your information, I
have attached a test report that provides information regarding performance of saline
formulations of AquaBlok. It would be greatly appreciated if the reference to AquaBlok's inability
to function in a saline environment is deleted from the final version of this report, or appropriate
qualifiers noted.

As a side note to the discussion in section 5.7.2. on Reactive Caps, we would also like to make
you aware of the successful conclusion of testing at the Anacostia River demonstration project. 4
Although a final report will not be made available for some time, positive results will published in
a paper to be presented at the January International Conference on Remediation of
Contaminated Sediments to be held in Savannah, Georgia.

We appreciate the time and effort that went into this document and we would be very happy to discuss further the potential consideration of AquaBlok as a capping alternative in the Whatcom Waterway Site We believe there may be several potential applications where AquaBlok may provide advantages over removal of material or thick sand capping in areas subject to erosive conditions.

You consideration of the above points is greatly appreciated.

Sincerely,

John A. Collins
General Manager

Encl

| Commenter No. | Name / Organization |
|---|---|
| 6 | Associated General Contractors |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Nov 29, 2006 | Liz Evans |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

1

AGC Associated General Contractors of Washington

November 29, 2006

Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
3190 160$^{th}$ Avenue
Bellevue, WA 98008

Via Email: iped461@ecy.wa.gov

Re: Whatcom Waterway Site Cleanup, Bellingham, WA

Dear Ms. McInerney,

On behalf of the Associated General Contractors of Washington, we urge you to
support Alternative #6 as the preferred option for cleaning the Whatcom 2
Waterway Site in Bellingham Washington and preparing it for redevelopment.

This option takes into account public safety, redevelopment potential and cost. Alternative #6 has received a high overall MTCA ranking, meets all MTCA threshold criteria, and its restorative time frame is among the lowest of the eight alternatives under review. MTCA finds Alternative #6 to be cost effective with favorable long term benefits.

The members of the Associated General Contractors are hopeful and excited about this critical redevelopment project. We recognize the impact this will have on our community's future and look forward to progressing to the cleanup phase of the project.

Sincerely,

Liz Evans
AGC of Washington

Commenter No. Name / Organization
7 Badgett, Frances

Commenter Submittals:

A Letter dated Dec 15, 2006
B Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Natural recovery | Concerns about performance | 5.15 |
| 2 | RI | Depth of contamination | Vertical distribution in Whatcom Waterway | 4.5 |
| 3 | FS | Capping details | Preference for thick capping | 5.8 |
| 4 | EIS | Navigation channel | Support for multi-purpose channel | 6.7 |
| 5 | FS | Sediment dewatering | Temporary use of ASB for dewatering | 5.17 |
| 6 | FS | Design & permitting | Separation of cleanup & reuse permitting | 5.27 |
| 7 | RI | BSL Basis | Fish consumption rates | 4.3 |
| 8 | FS | Log Pond | Concerns about cap effectiveness | 5.14 |
| 9 | FS | Capping costs | Monitoring costs | 5.11 |
| 10 | FS | Capping costs | Contingent remedies & repairs | 5.12 |
| 11 | FS | Cap monitoring | Duration of cap monitoring | 5.10 |
| 12 | FS | Institutional controls | Applicability to filled ASB | 5.8 |
| 13 | RI | ASB Status | Applicable cleanup levels | 4.12 |
| 14 | FS | Capping costs | Contingent remedies & repairs | 5.12 |
| 15 | FS | Project funding | Insurance and grant funding | 5.26 |
| 16 | FS | Unit costs | Form of cost estimates | 5.24 |
| 17 | RI | Contaminant distribution | Vertical distribution in Whatcom Waterway | 4.5 |
| 18 | FS | Sediment dewatering | Temporary use of ASB for dewatering | 5.15 |
| 19 | RI/FS | Source control | Source control at chlor-alkali plant site | 4.9 & 5.29 |
| 20 | RI/FS | Source control | Stormwater & recontamination | 4.9 & 5.29 |
| 21 | FS | Source control | Timing of cleanup relative to source control | 5.29 |
| 22 | RI | BSL Basis | Toxicity assumptions | 4.3 |
| 23 | RI | BSL Basis | Uncertainty analysis | 4.3 |
| 24 | EIS | Pilot goals | Interpretation of "faster, better, cheaper" | 6.12 |
| 25 | FS | Remedy preferences | General preferences | 5.1 & Table 5-2 |
| 26 | FS | Wind & wave erosion | Storm surge | 5.3 |
| 27 | FS | Natural recovery | Concerns over effectiveness | 5.15 |
| 28 | FS | Source control | Source control at chlor-alkali plant site | 4.9 & 5.29 |
| 29 | FS | Source control | Source control at chlor-alkali plant site | 4.9 & 5.29 |
| 30 | FS | Source control | Source control at chlor-alkali plant site | 4.9 & 5.29 |
| 31 | RI | BSL Basis | Need for risk assessment | 4.3 |
| 32 | FS | Unit costs | Form of cost estimates | 5.24 |
| 33 | FS | Disproportionate cost analysis | Inappropriate rejection of alternatives | 5.25 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

1

Frances Badgett | 2514 West Street | Bellingham, WA 98225

Dear Ms. McInerney,

I understand fully that Ecology's role in the RI/FS evaluation process is to provide regulatory review for the Port of Bellingham's preferred alternatives for cleanup of the waterfront, and that the landowner's voluntary and motivated cleanup precludes having to enforce environmental violations after the cleanup has taken place. But I do hope you are willing to contribute more than just a rubber stamp to Preferred Remedial Alternatives 5 and 6. I would like to see permanently protective remedies for our beautiful waterfront, rather than the marina-driven cleanup plan offered by the Port.

In several places in the RI/FS there is an assertion that the current conditions in
the Whatcom Waterway (particularly regarding natural recovery) will continue
in perpetuity. But there is no scientific analysis of the current conditions.
Bellingham Bay is alleged to be inherently protective, a place where benthos and
shellfish and other organisms do not uptake mercury. This argument is used by
Retec and the Port as a reason to cap rather than dredge sediments as the
preferred method of remediation. However, this naturally protective system is 2
not well understood. At a question-and-answer session during one of the
meetings hosted by Ecology and the Port, a representative from Retec said that
Retec had created a "one-dimensional box-study" of the data, and core samples
showed that this process has been operating for the past 100 years. The problem
is, these conditions that we don't understand can change without our notice,
particularly as global warming continues to alter the marine environment. If we
knew how Bellingham Bay healed itself, we would know how to anticipate
changes. We don't, and we can't. So I urge you not to hinge the health of our
waterway on a system that is unpredictable.

**Recommendations and Suggestions:**

6400 residents of Whatcom County signed the Healthy Bay Initiative. 500 people signed the Bellingham Bay Foundation's "Cleanup not Cover Up" petition requesting more removal than capping. 32 people spoke at a public hearing in favor of removal of mercury rather over capping. The public hearing competed with two other important meetings—one of which set legislative priorities for Governor Gregoire's Puget Sound Partnership, the other a City Council meeting—and yet approximately 75 people showed up. The residents of Whatcom County have clearly indicated a preference for a cleanup that goes beyond the two Preferred Remedial Alternatives, 5 and 6. Defining the Port as the landowner and ignoring the fact that this is publicly owned land drains this community of confidence in your remedy. I remain hopeful that you can create a cleanup plan that emphasizes the removal of mercury from areas outside the ASB.

1. Study and revise alternative 7 to reflect dredging depth for remediation,
   not just dredging depth for the federal channel. In your shaky response to 3
   this recommendation at the public hearing, Ecology said that mercury
   existed at depth in the shipping channel, so one would have to dredge
   that far anyway. However, it has been stated several times (in the RI/FS as
   well as in public) that dredging the inner Whatcom Waterway dredges
   clean sediments as well as contaminated sediments. Create a map (as
   described under "missing documents") that would show the depth of the
   federal channel vs. the depth of sediments. This would give the
   community a clear indication of where the mercury-contaminated
   sediments are located. Dredging could occur down to the levels of
   potential disturbance, but not as far as the federal channel depth. Please #4-B
   study dredging the potentially disturbed areas, capping very thickly on
   top of those dredged areas, and creating nearshore habitat with those
   caps. This permanently removes mercury from the Whatcom Waterway,
   maintains the multipurpose channel, and creates a net gain for habitat, 4
   consistent with the goals of the Bellingham Bay Demonstration Pilot and
   planned land use changes from industrial to residential.

2. Seriously study and consider dredging wherever it is technically
   practicable to permanently remove mercury from the aquatic ecosystem.
   Hydraulically dredging mitigates resuspension of sediments. In order to
   hydraulically dredge, a nearby disposal facility has to be available. How 4
   lucky, then, that we have the ASB. I recommend using it for the temporary
   dewatering of sediments, then sending them to a Subtitle D landfill. Cap
   over dredged areas with thick, protective caps. These caps can be used to
   safely create habitat.

3. Should you insist on cleaning out the ASB, leave the breakwater intact.
   The Port has a permitting process to complete before they can construct a
   marina. I recommend leaving the ASB whole and intact while that process
   takes place. Creating nearshore habitat in the inner Whatcom Waterway
   would mitigate the loss of interior ASB habitat. The ASB could be left as a 5
   question mark, a blank slate, rather than a conclusion of the RI/FS and
   Ecology's cleanup. Instead of spending MTCA money on resculpting the
   ASB for water circulation and flushing, terracing the ASB's basin edges
   and reshaping the dikes into breakwaters, the ASB could be cleaned out,
   the liner removed, and the construction of a marina left as a separate
   development process.

4. Make the BSL more protective. The BSL of 1.2 ppm is site-specific and based on the "Bay mystery" that benthos and other organisms do not uptake as much mercury as they should, given the prevalence of mercury in Bellingham Bay. This number is not based on consumption of fish by children, nor by sensitive groups such as nursing babies and outpatients at hospitals. These groups are typically part of EPA human health risk assessments, but are not reflected in this RI/FS. In fact, in defending the BSL, the RI/FS states that tribal members aren't likely to fish in the Whatcom Waterway regularly enough to require more protective standards: "Actual fishing activity is likely to be more varied, with fish and shellfish obtained from a variety of locations within the greater Bellingham Bay and Rosario Strait areas…" We currently have active, regular fishing at the head of Whatcom Waterway, which is slated for "natural recovery." Please recalculate this number to be more protective of sensitive populations. 6

5. Consider the Log Pond with care. Though you state publicly the Log Pond cap is successful and mercury levels are not rising in that site, the five-year monitoring tables in the RI/FS tell a different story: #5-A

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

As this graph demonstrates, surface levels of mercury are rising in four out of the six samples. This unexplained rise in mercury levels, coupled with the anticipated erosion suggests that any additional capping will have to be protectively engineered, carefully monitored, and quickly repaired. I would like to see these costs reflected as part of the RI/FS, not in a separate document. The RI/FS only sets one cost across all 3 4

8 alternatives for monitoring. It would make more sense to monitor the
areas with the highest mercury (153ppm under an eroding corner of the 2
Log Pond Cap, for example) more closely than those with less, and use
this proportionate monitoring program as a basis for the entire Whatcom
Waterway, wherever capping is used. Caps should also be monitored
for longer than 10 years. The Environmental Protection Agency
recommends monitoring for a minimum of 30 years. Take into
consideration the difficulty of the continuity of monitoring, the potential
for seismic events, storm surge, biomagnification of mercury through
bioactivity, and other changes to the Log Pond, in addition to the costs of
monitoring and repair. After careful consideration, should you choose to 1
cap the Log Pond, do so thickly—6-10 feet, or proportionate to the
amount of mercury underneath.

6. Be honest about the ASB. The levels of contamination in the ASB are not "significant" or even "elevated." The ASB has a high of 22 ppm of mercury, averaging 6 ppm. With upland designation, it is so clean, the sludges may not even need Subtitle D disposal. The phenolic compounds in the ASB break down over time, and are not persistent bioaccumulative toxins as is mercury. In contrast, the Log Pond has a capped area of 153 13 ppm. I am not recommending a particular outcome or remedy here, just requesting that the public be given accurate information about the levels of contamination throughout the site. Dispelling the myth that the ASB is the "most contaminated part of the Whatcom Waterway"—rather than fueling this myth by insisting that its level of toxicity demands that it be included as part of the cleanup site—would be a public service. The 2002 RI/FS describes the ASB:

> Under MTCA, in those situations where hazardous substances remain on-site at concentrations above applicable cleanup levels, institutional controls such as deed restrictions or restrictive covenants may be required to protect the integrity of the remedial action and prevent exposure to contaminants remaining at the site. However, based on data collected during the RI/FS (Anchor and Hart Crowser 2000), sediment concentrations within WW Area Alternative J dredge prism (Figure 12) are below prospective Method B MTCA soil cleanup levels for unrestricted land uses, particularly if water quality is already addressed (see above). For example, the MTCA Method B 14 (unrestricted land use) cleanup level for mercury in soil to protect from potential soil contact exposures is 18 mg/kg (Ecology 2001), while the maximum sediment mercury concentration within the Alternative J dredge prism is 12 mg/kg. Thus, MTCA restrictive covenants (WAC 170-340-440(4)(a)) may not be applicable to the ASB CDF.

I would also like to see engineering reports that explore different options for the ASB, other than just cleaning it out. A clear step-by-step outline of the remediation process for the ASB, as defined in the Preferred Remedial Alternatives, would also be helpful. The ASB's unexplained reduction in protective status from an engineered Confined Disposal Facility to Confined Nearshore Disposal needs detailed explanation.

7. Leave less mercury behind. Favor the removal of mercury and capping on top of dredging over capping over mercury alone. Cleaning up the Whatcom Waterway will never be easier or cheaper than it is right now, before residents move in along its banks and pedestrians, children, college students, and office workers are circulating along bike paths and boardwalks. Removing mercury ensures that the residents of Whatcom County can be confident in a safe and healthy waterfront.

8. Provide an honest cost analysis and breakdown of costs. The RI/FS does
   not include the coverage of insurance and the aid from grants in the 8 15
   Alternatives. This analysis is misleading. The previous RI/FS from 2002
   gave a full financial analysis associated with cleanup, including how
   many dollars per cubic yard it would cost to cap, and how many dollars
   per cubic yard it would cost to dredge, disposal of dredged material, and
   other costs. There is no such breakdown of costs in this RI/FS, nor an 16
   honest analysis of the costs within the existing RI/FS.

**Missing Documents:**
Several documents are either referenced or mentioned in the RI/FS, and some are completely missing.

1. Engineering reports on dredging the Whatcom Waterway for remediation
   rather than for federal channel depth. 17

2. A map that shows the bathymetry of contaminated sediments, the dredge depth for remediation, and the dredge depth for the federal channel in the Whatcom Waterway.

3. Engineering reports about the ASB that include temporary settling and
   dewatering of hydraulically dredged sediments, filling the ASB without 18
   the bentonite liner, and other options that are not explored in the current
   RI/FS.

4. The RI/FS declares that with the closing of most of G-P's operations,
   including the chlor-alklai facility, the sources for contamination have been
   controlled. But closing G-P does not necessarily mean that all the mercury
   around the site has been controlled. I would like to see solid
   documentation that the seriously contaminated upland area of the former 19
   G-P site (12,500 ppm of mercury in the caustic plume area alone) is not
   going to recontaminate the Whatcom Waterway. It isn't enough to be
   flatly told this in a few sentences—the public needs to feel confident that

after all this time and money is spent, the remedy you choose will be permanent. I know this is not the case in Tacoma, where the stormwater runoff has already recontaminated the Foss Waterway 20
(http://www.thenewstribune.com/news/environment/story/5557873p-5002243c.html). It concerns me that Ecology has allowed the Port to push for cleanup of the water before the uplands, again to speed and ease the development of a marina. Whatcom County has suffered enough abuse from agency-approved contamination. It's time for that cycle to end.

5. I would also recommend attaching to the RI/FS the City of Bellingham's comprehensive stormwater plan, which identifies the plan outlined by the city for the treatment of stormwater runoff. Runoff caused the recontamination at the Foss Waterway in Tacoma. 21

6. No Human Health Risk Assessment was performed for the waterfront. Below is the EPA's Policy on Evaluating Health Risks to Children:

**POLICY**
It is the policy of the U.S. Environmental Protection Agency (EPA) to consider the risks to infants and children consistently and explicitly as a part of risk assessments generated during its decision making process, including the setting of standards to protect public health and the environment. To the degree permitted by available data in each case, the Agency will develop a separate assessment of risks to infants and children or state clearly why this is not done—for example, a demonstration that infants and children are not expected to be exposed to the stressor under examination. 22

**BACKGROUND**
When it comes to their health and development, children are not little adults. This maxim has long been understood in the medical community. Documentation of the similarities and differences between children and adults is an integral part of assessing the effects and efficacy of drugs, for example. The National Academy of Sciences has pointed out on more than one occasion that the maxim should hold true with respect to exposure to environmental pollutants, as well. Children may be more or less sensitive than adults when confronted with an equivalent level of exposure to an environmental pollutant. In many cases, their responses are substantially different—qualitatively and quantitatively—from those exhibited by adults. These age-related variations in susceptibility are due to many factors, including differences in pharmacokinetics, pharmacodynamics, body composition, and maturity of biochemical and physiological functions (for example, metabolic rates and pathways). In addition, there are often age-related differences in types and levels of exposure. For example, it is known that infants and children differ from adults both qualitatively and quantitatively in their exposures to pesticides in foods. Children eat more food and drink more water per unit of body weight, and the variety of the food they consume is more limited than adults. Children also breathe more rapidly than adults and can inhale more of an air pollutant per pound of body weight than adults. Children's skin and other body tissues may absorb some harmful substances more easily. Children's bodies are not yet fully developed, so exposure to toxic substances may affect their growth and development. Infants' immune systems are not as strong as those of healthy adults, so they are less able to fight off emerging microbial threats such as Cryptosporidium in drinking water. The Agency is particularly concerned about safeguarding the health of infants and children, who are among the nation's most fragile and vulnerable populations. Therefore, it is important that there be a clear articulation of policy in this regard.

Part of this Human Health Risk Assessment should be an Uncertainty Assessment. The following is a description from the EPA (emphasis mine). A document of this kind would lend transparency to the Whatcom Waterway RI/FS: 23

> **Uncertainty Assessment**
> Professional judgment is needed to determine the uncertainty associated with information from the literature and any extrapolations used in developing a parameter to estimate exposures. All assumptions used to estimate exposures should be stated, **including some description of the degree of bias possible in each.** Where literature values are used, an indication of the range of values that could be considered appropriate also should be indicated.

**Conclusion:**

I'd like to thank you for taking the time to go through these comments. Ecology is in the unenviable position of having to balance the wishes of the community with those of the Port of Bellingham. I know that the Bellingham Bay 24
Demonstration Pilot recommended a "faster, better, cheaper" cleanup of the waterfront. "Faster" and "cheaper" are represented in alternatives 5 and 6, your preferred remedial alternatives. Please do not sacrifice "better" in the service of faster and cheaper. Without the important component of a better, more protective and permanent remedy, faster and cheaper are rendered meaningless. Keep all three in lockstep, even if it means creating a new RI/FS, generating new reports and studies of the Whatcom Waterway, and dealing with static from the Port of Bellingham. Cleaning the Whatcom Waterway is a one-time opportunity, and we'd all like to see it done well. The City of Bellingham signed interlocal agreements with the Port of Bellingham to prevent them from advocating for anything other than the Port's preferred cleanup alternatives. G-P and the Port are bound by Item 11 of the Purchase and Sale Agreement:

"Georgia-Pacific and the Port shall cooperate and jointly seek the agreement of Ecology to accept and issue for public review and comment Alternative "K" [5 and 6] proposed by the Port for the remediation of the Whatcom Waterway Site. Neither Georgia-Pacific nor the Port shall publicly or privately, directly or indirectly, advance, promote or attempt to influence any other remediation plan for the Whatcom Waterway Site."

But you are not bound by these constraints. Please remember this as you consider these comments, and the comments of others in this community who 25
want more cleanup than reflected in Alternatives 5 and 6, who want less mercury left behind.

Thank you,

Frances Badgett

#7-B

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Frances Badgett**
Frances Badgett, 2514 West St. I want to play off something Elizabeth Kilanowski said. That
storms surge is called rare. This is a problem I found throughout this document. I think one of the 26
challenges Ecology has right now is to get this community confident in whatever you choose.
Whatever plan you chose, we're all going to be on board, and we're going to feel protected.

One way of doing that is to make the language of the RIFS more certain. There is a lot of stuff in there about "is likely to" "is expected to" is sort of "going to." I know part of the reason for capping is that benthic organisms don't seem to be uptaking the mercury as much as they should given that there is so much out there. But this particular kind of sliding around of language and using a lot of adverbs gets really dangerous when you start talking about increases in toxicity at the Log Pond cap for example, the increases in mercury there. And how well we understand the processes of the Bay and how much these benthic organisms uptake or don't should determine the protectiveness?

So when we're talking about, we're kind of hinging our future on natural recovery which is 27
expected to continue and the sedimentation of the Nooksack which is likely to continue.

We don't really understand it and we're basing this kind of hopeful future on this scenario that we don't understand. We don't know why natural recovery happens and we don't know why the Bay is inherently protective

For that reason we should be favoring removal because what is causing that protectiveness could
change, it might have something to do with the salinity of the ocean, it might have temperature, it
might be something that could change because of global warming, we don't know. So for that
reason we have this risk out there. As for there is another problem I think the community keeps 28
harping on. Which is that we're remediating the water first and the land second and I know that
you've said that – with the closing of the Chlor-Alkali plant, with the closing of GP that the land
is not likely to recontaminate the waterway. But other than saying that in this document we don't
get a report, we don't get a sense of how that is happening or not happening. We don't see the
city stormwater report, but it's mentioned. So we don't have any confidence that that's really 29
true. Given that in other areas of Puget Sound where millions of dollars have been spent on
cleaning up the caps that did recontaminate from stormwater. We should probably look into that.

30

Also, I have a question about the fact that there was no document that is a human health risk
assessment. A separate document performed for the Whatcom Waterway. That seems to be
problematic. I was reading about EPA human health risk assessments and they typically evaluate
potential risk from facilities over long periods of times, greater than 30 years. Which is far longer 31
than the ten years slated for the Log Pond for example.

Alternative J had very specific cost estimates and break downs in the old RIFS. There were 32
actual costs per cubic yard for dredging, costs per cubic yard for capping. I have not seen that

here. I have not seen a breakdown spreadsheet of the costs for different actions and I think that would be a good thing to add.

In closing, I think it's odd and I don't know why this is true that there are 4 alternatives in RIFS that will not be seriously considered because they conflict with land use because they do not include a marina and I'm not sure why we didn't get eight full alternatives that would have included all the possibilities with a marina If you're going to knock anything off that didn't include a marina automatically. That's all I'm going to say, Thank you. 33

Commenter No. Name / Organization
8 Baker, Gary

Commenter Submittals:
A E-mail dated Dec. 18, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

30

**From:** GBAKER385@cs.com [mailto:GBAKER385@cs.com]
**Sent:** Monday, December 18, 2006 12:25 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham Waterfront

Dear Lucy,

I am in support of the Port of Bellingham's current plan to clean-up and develop the Bellingham waterfront. I'm a resident and have been sailing out of Bellinham harbor for over 30 years. 31

Sincerely,

Gary Baker

Commenter No. Name / Organization
9 Beall, Roni

Commenter Submittals:
A E-mail dated Dec. 10, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Seismic stability | Capping stability in earthquakes | 5.7 |
| 2 | FS | Remedy preferences | General preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

25

**From:** Roni Beall [mailto:roni.beall@gmail.com]
**Sent:** Sunday, December 10, 2006 4:45 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham Bay Clean-up

Capping rather than clean-up seems penny-wise and pound foolish to say the least. The economic health of our community and our children are greatly at risk if we simply cap and the near inevitable earthquake hits. Thanks for listening. I am strongly in favor of removing mercury and other contaminants from our waterways to the extent that is reasonably possible given the state of our current technology. Capping is folly! #7-B 26

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Roni Beall

| Commenter No. | Name / Organization |
|---|---|
| 10 | Bean, Patty |

Commenter Submittals:

A Letter dated Dec 11, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Cost accuracy | Costs of Alternative 7 | 5.23 |
| 2 | RI | Contaminant distribution | Vertical distribution in Whatcom Waterway | 4.5 |
| 3 | FS | Remedy preference | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | FS | Capping costs | Monitoring costs | 5.11 |
| 5 | FS | Cap monitoring | Duration of cap monitoring | 5.10 |
| 6 | FS | Capping costs | Contingent remedies & repairs | 5.12 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
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| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

12/11/06

#7-B

December 11, 2006

Lucille McInerney, Site Manager
Washington State Department of Ecology
3190 160th Ave
Bellevue, WA 98008

RE: Whatcom Waterway Site RI/FS Cleanup Plans

Dear Ms. McInerney,
I appreciate the continued efforts of Ecology to put forth a plan for the best possible cleanup of Bellingham's highly contaminated Whatcom Waterway Site. I realize that there have been several changes since the original RI/FS documents were released and these have been addressed in the 2006 version. However, I believe the current preferred alternatives (5 & 6) do not go far enough in developing a permanent cleanup that the public can have confidence in.

Cleanup plans use the waterway status as the driver for the alternatives instead of
citing removal of mercury as the overarching goal. We're left with a choice of either a
Federally designated channel or simply a navigable channel for smaller boats. The
preferred alternatives both consider the waterway as de-regulated, will cap the
mercury in place and will maintain the waterway only as a navigable channel. This
plan removes the mercury from the contained ASB and leaves the waterway mercury
in place with the premise that the 3 to 6 foot cap will sequester the contaminated
sediments for the indefinite future. The alternative #7 plan is to dredge the inner
waterway to achieve a designated navigation channel and remove the contaminated
ASB sediments. However, the Port is seeking to remove the channel from this status.
If the driver of the alternative 7 inner watery cleanup plan was to remove the 26
contaminants from the waterway, the projected cost of alternative 7 would come
down, since dredging for a navigation channel includes removing clean sediment.
There should be an alternative which removes the majority of mercury present in the
waterway, maintains small boat navigation and cleans the ASB as well. The cost 27
would range somewhere between alternative 6 and 7, and it would rate high on the
MTCA rankings. Why isn't there this option? Why are we to choose from only
alternatives where future land use has such a high impact on the alternative? Isn't a 28
cleanup plan to be just that – a plan to cleanup contaminated marine sediments?

If we look at the time frame for alternative 6, which must be considered under
MTCA, the time frame to cap the inner waterway may be less than to remove the
mercury from the waterway and capping what remains, however, to be fair, one must
look at the future to get a true sense of the time frame. The cost and time for
indefinite long-term monitoring should be included in any alternative where the main
remediation is capping. There is a standard amount of $640,000 for monitoring costs 29
for most of the alternatives. This does not differentiate among the mainly capping or
mainly dredging alternatives. This is clearly not an accurate reflection of cost or time.
Mercury left behind in the waterway will remain indefinitely. Therefore, monitoring

will be indefinite and any unforeseen event which releases the buried mercury will 30
need to be remediated. An alternative which I described above would cost less in the long run since the need for indefinite long-term monitoring and future fixes would not
be required. 31

I urge Ecology to consider removing the maximum amount of mercury from the Whatcom Waterway site, not just in areas already contained like the ASB, but more importantly, in areas open to the bay, where people, land and sea life interact with the environment and in an area which could become a very vital part of downtown Bellingham if the cleanup was to be done well. I urge you to create an alternative where the safe removal of mercury from the environment is the goal, instead of a navigation channel or a clean marina. Leaving the GP legacy of highly toxic mercury and other contaminants in our waterfront under a cap of clean sediments does not provide for the highest confidence in public health and safety now or in the future.

Sincerely,

Patty Bean

Patty Bean
3185 Black Jack Trail
Glenhaven, WA 98284

<u>Commenter No.</u> <u>Name / Organization</u>
11 Beddill, Marian

<u>Commenter Submittals:</u>
A Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Seismic stability | Cap stability in earthquakes & tsunamis | 5.7 |
| 2 | FS | Remedy preferences | General preferences | 5.1 & Table 5-2 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

26

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Marian Beddill**
Good evening and thank you. Marian Beddill, citizen and resident of Bellingham and environmental activist. I'm going to ask you a rhetorical question, which you can't answer now but I'll try to answer for you. Would the appropriate agencies, Department of Ecology or whoever grant a permit to an industry to discharge into these waterways in compliance with the Washington State Model Toxics Control Act and any other laws and regulations and rules the level of contamination which you observe in the bay today? Would that be permitted with a new industrial permit?

My rhetorical, presumptive answer is no, you would not. Thus it seems to me illogical and contrary to the spirit and the intent and the purpose of that act and other related documents. I can not condone the approval of leaving the mercury and the other contaminants in the bay as is currently being considered.

A major concern for me with my experience in hydrology and engineering is the movement of
the soils and the response to hydrologic circumstances, in particular an earthquake, a tsunami. If 27
they are given adequate consideration in your report, I didn't see it. I think there is a passing reference to it.

The fact of what would happen to the capping if it were built that way makes a mockery of your allegations that covering stuff is adequate.

On the financial side what I see is your trying to pinch pennies now and sets it up in a circumstance that does not avoid human health and other biological health impacts later and is likely to lead to higher expenses later in an additional recovery after something bad happens.

So my recommendation, please remove the maximum possible contaminants, mercury and other
things. Dispose of it upland in the proper manner that you, the state, does know how to do. And a 28
final recommendation is, run these meetings on time.

| Commenter No. | Name / Organization |
|---|---|
| 12 | Bellingham Bay Foundation |

Commenter Submittals:

| | | |
|---|---|---|
| A | E-mail dated Oct 27, 2006 | Anna Hall Evans (BBF Acting Director) |
| B | E-mail dated Dec 18, 2006 | Anna Hall Evans (BBF Acting Director) |
| C | Letter dated Dec 14, 2006 | Anna Hall Evans (BBF Acting Director) |
| D | Elway Poll Report dated April 2006 | Elway Research |
| E | Voter Poll dated June 2006 | Applied Research Northwest, LLC |
| F | Healthy Bay Initiative Text | |
| G | E-mail dated Dec 18, 2006 | Anna Hall Evans (BBF Acting Director) |
| H | Letter dated Dec 18, 2006 | Anna Hall Evans (BBF Acting Director) |
| I | Healthy Bay Resolution | BBF Board of Directors |
| J | Healthy Bay Principles | Bellingham Bay Foundation |
| K | Letter dated Dec 18, 2006 & Petition | John D'Onofrio (BBF Director) |
| L | Letter dated Dec 18, 2006 | Gregorgy Glass (BBF Consultant) |
| M | Attachment to Dec 18th Letter | Gregorgy Glass (BBF Consultant) |
| N | Attachment to Dec 18th Letter | Gregorgy Glass (BBF Consultant) |
| O | Public Hearing Transcript Excerpts | Anna Evans (BBF Acting Director) |

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | EIS | Marina comments | Opposes development of new marina | 6.8 |
| 2 | EIS | Alternative ASB Uses | Favors upland ASB reuse | 6.9 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | FS | Disproportionate cost analysis | Presentation of public concerns in DCA | 5.25 |
| 5 | FS | Polling & petitions | Petition regarding site cleanup | 5.31 |
| 6 | FS | Polling & petitions | Polling data | 5.31 |
| 7 | EIS | Alternative ASB Uses | Favors upland ASB reuse | 6.9 |
| 8 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 9 | EIS | Property ownership | Ownership of former GP properties | 6.3 |
| 10 | FS | Polling & petitions | Polling data | 5.31 |
| 11 | FS | Polling & petitions | Polling data | 5.31 |
| 12 | FS | Polling & petitions | Healthy Bay initiative text | 5.31 |
| 13 | FS | Disproportionate cost analysis | Concerns about alternatives analysis results | 5.25 |
| 14 | FS | Polling & petitions | Polling data | 5.31 |
| 15 | FS | Polling & petitions | Healthy Bay principles | 5.31 |
| 16 | FS | Disproportionate cost analysis | Concerns about alternatives analysis results | 5.25 |
| 17 | FS | Dredging methods | Ability to perform hydraulic dredging | 5.19 |
| 18 | FS | Cap monitoring | Type & duration of monitoring | 5.10 |
| 19 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 20 | FS | Capping costs | Costs of maintenance & repairs | 5.12 |
| 21 | FS | Cap design | Preference for thick capping | 5.8 |
| 22 | FS | Project funding | Favors limitation on MTCA grant funding uses | 5.26 |
| 23 | FS | Cap design | Preference for thick capping | 5.8 |
| 24 | EIS | Pilot goals | Support for Pilot goals 1, 2 & 3 | 6.12 |
| 25 | FS | Dredging methods | Suitability of hydraulic & mechanical methods | 5.19 |
| 26 | FS | Sediment dewatering | Potential use of ASB for sediment dewatering | 5.17 |
| 27 | FS | ASB comments | Damage to ASB liner during dredging | 5.20 |
| 28 | FS | Cost accuracy | Dredging volumes for cleanup in channel | 5.23 |
| 29 | FS | Cap design | Preference for thick capping | 5.8 |
| 30 | FS | Cap monitoring | Scope & duration of long-term cap monitoring | 5.10 |
| 31 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 32 | FS | Capping costs | Costs of maintenance & repairs for caps | 5.12 |
| 33 | FS | Scope of cap monitoring | Type & duration of monitoring | 5.12 |
| 34 | RI | Source control | Concerns about upland source control status | 4.9 |
| 35 | FS | Capping costs | Costs of maintenance & repairs for caps | 5.12 |
| 36 | FS | Project funding | Favors limitation on MTCA grant funding uses | 5.26 |

Commenter No. 12 — Name / Organization: Bellingham Bay Foundation

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| *(Continued from First Page)* | | | | |
| 37 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 38 | FS | Polling & petitions | Polling data | 5.31 |
| 39 | FS | Polling & petitions | Healthy Bay Initiative | 5.31 |
| 40 | RI | Additional investigations | Discussion of data gaps | 4.10 |
| 41 | RI | Methylmercury concerns | Favors evaluation of methylmercury processes | 4.8 |
| 42 | RI | Additional investigations | Data are adequate for alterantives evaluation | 4.10 |
| 43 | RI | General mercury concerns | Discussion of mercury toxicity & PBT status | 4.1 |
| 44 | FS | Capping design | Favors use of thick capping | 5.8 |
| 45 | FS | Capping effectiveness | Concerns over long-term cap performance | 5.2 |
| 46 | FS | Disproportionate cost analysis | Discussion of alternatives evaluation | 5.25 |
| 47 | FS | Capping design | Favors use of thick capping | 5.8 |
| 48 | FS | Disproportionate cost analysis | Mercury removal in alternatives evaluation | 5.25 |
| 49 | FS | Capping design | Favors use of thick capping | 5.8 |
| 50 | FS | Dredging disturbance | Resuspension & water quality during dredging | 5.16 |
| 51 | FS | Disproportionate cost analysis | Land use & habitat in alternatives evaluation | 5.25 |
| 52 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 53 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 54 | RI | Contaminant distribution | Vertical distribution of contamination in channel | 4.5 |
| 55 | FS | Cost accuracy | Costs & volumes of contaminated sediment | 5.23 |
| 56 | FS | Cost accuracy | Capping material purchase/reuse costs | 5.23 |
| 57 | FS | Capping design | Favors use of thick capping | 5.8 |
| 58 | FS | Cost accuracy | Shoreline infrastructure costs for deep dredge | 5.23 |
| 59 | EIS | Pilot goals | Evaluation of "Faster, Better, Cheaper" | 6.12 |
| 60 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 61 | FS | Disproportionate cost analysis | Responding to RI/FS public comments | 5.25 |
| 62 | RI | BSL basis | Methylmercury fraction in seafood | 4.3 |
| 63 | RI | BSL basis | Seafood consumption rates for children | 4.3 |
| 64 | FS | Capping design | Wood waste effects on cap stability | 5.8 |
| 65 | FS | Cap design | Favors use of thick capping | 5.8 |
| 66 | RI | BSL basis | Seafood consumption rates | 4.3 |
| 67 | RI | Seafood quality | Difficulty in reviewing seafood sampling data | 4.4 |
| 68 | RI | Source control | Mercury leaching from adjacent upland sites | 4.9 |
| 69 | RI | Mercury methylation | Uncertainties of methylation processes | 4.8 |
| 70 | RI | Natural recovery | Sufficiency of natural recovery data for waterway | 4.6 |
| 71 | FS | Natural recovery | Predictability of natural recovery | 5.15 |
| 72 | FS | Institutional controls | Effectiveness of different institutional controls | 5.28 |
| 73 | RI | Relative contaminant levels | Concerns with cumulative enrichment ratio | 4.11 |
| 74 | RI | Specific data comments | Comments regarding Figure 5-10 | 4.19 |
| 75 | FS | Disproportionate cost analysis | Graph of mercury removal against costs | 5.25 |
| 76 | FS | Capping design | Preference for thick capping | 5.8 |
| 77 | FS | Disproportionate cost analysis | Presentation of public concerns in DCA | 5.25 |
| 78 | FS | Project funding | Favors additional taxes for more cleanup | 5.26 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

#1-A

**From:** Anna Evans [aevans@bbayf.org]
**Sent:** Friday, October 27, 2006 12:31 PM
**To:** McInerney, Lucy (ECY)

**Attachments:** Bellingham Bay Full Report 0406[1].pdf; BBF 2006 Frequency Report, FINAL.rtf
Hi Lucy,

It was nice to finally get a chance to meet you last night. Thanks again for all your work in making the presentation a success. I do have a couple of preliminary comments I'd like to offer for the record.

First, I noticed that last night's presenters repeatedly referred to proposed land-use changes in the
Whatcom Waterway as what "the community" wants. While it's certainly true that there's a great deal
of excitement within our local community about possibilities for the downtown waterfront, there is 1
likewise significant disagreement about the best uses for large portions of the area, especially with
regard to the ultimate fate of the ASB lagoon. In fact, independent polling conducted last spring by
Elway and Associates showed that 56% of local citizens preferred the ASB be redeveloped as "a large 2
central park," as opposed to 30% who agreed it should be a marina. A more detailed poll conducted by
Applied Research Northwest found similar results. I've attached summaries of both these polls for your
review (the park/marina question is #16 in the ARNW poll). The Port of Bellingham appears to have
convinced our city officials that a downtown marina is the best use for the ASB, but as these polls
demonstrate, this does not necessarily reflect the opinion of public at large. In fact, if the opinion of "the 1
community" were taken into account, a cleanup alternative such as #3 in the current RI/FS might well
score higher according to the land-use criteria. At the very least, in the interests of accuracy, I would 2
hope that your representatives clarify that it is the Port of Bellingham, not "the community," that wants a
marina in the ASB.

Secondly, I'd like to comment on the issue of a possible public hearing on the RI/FS. I've already signed a petition requesting a hearing, so this comment shouldn't count as an additional "vote." But as I discussed with Shannon Sullivan last night, there is a already a great deal of public skepticism about the authenticity of this process. Of course your agency has nothing to do with the Port's handling of the redevelopment proposals thus far, but for better or worse, the RI/FS comment process runs the risk of being widely perceived as part of a larger pattern of institutional obfuscation and arrogance that pays heed to public process in name only. A formal hearing would surely help assuage doubt about the credibility of Ecology's commitment to public participation. Our understanding is that MTCA regulations require DOE to schedule a hearing if fifty people request one. Is this correct?

Thanks for your attention, Lucy.

Yours,

Anna Hall Evans
Bellingham Bay Foundation
1208 Bay Street, Suite 101
Bellingham, WA 98225
360-527-2733

To find out how you can help make Bellingham's waterfront clean and healthy for all of us, visit our websites at www.bbayf.org or www.ahealthybay.org

**From:** Anna Evans [mailto:aevans@bbayf.org]
**Sent:** Monday, December 18, 2006 4:11 PM
**To:** McInerney, Lucy (ECY)
**Cc:** 'Patty'; 'Greg Glass'; 'Alice Clark'; 'Anne-Marie Faiola'; 'Bob Kelly'; 'Darrell Hillaire'; 'David Syre'; 'Elisabeth Britt'; 'Frances Badgett'; 'George Dyson'; 'John D'Onofrio'; 'Lenny Dixon'; 'Lisa McShane'; 'Mitch Friedman'; 'Murphy Evans'
**Subject:**

Hello Lucy,

Attached are electronic copies of the documents I mailed to your office on Friday. In addition to these voter surveys, several of our board members have recently undertaken a petition drive as part of the public comment on the RI/FS. Since Thanksgiving, more than 700 local citizens have signed a petition calling for the Department of Ecology to require removing mercury from the Whatcom Waterway. I'll forward those petitions to you this afternoon via USPS. #4-B

Thank you for your consideration of all these materials.

Anna Hall Evans
Bellingham Bay Foundation
1208 Bay Street, Suite 101
Bellingham, WA 98225
360-527-2733

4

# Bellingham Bay Foundation

1208 Bay Street, Suite 101 • Bellingham, WA 98225
(360) 527-2733 • fax (360) 527-2871
website: www.bbayf.org • email: info@bbayf.org

December 14, 2006

Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
Northwest Regional Office
3190 160th Avenue
Bellevue, WA 98008-5452

Dear Ms. McInerney,

Enclosed please find complete results of the two public opinion polls I referenced in oral testimony at Monday's hearing. On behalf of the Bellingham Bay Foundation, I'd like to submit these results for the record as part of our comments on the Whatcom Waterway RI/FS. Both surveys were commissioned by the Bay Foundation in an effort to more fully understand local citizens' desires and concerns about issues surrounding Bellingham's historic waterfront redevelopment project. The first poll was conducted in April 2006 by Elway & Associates; the second, more detailed survey was conducted in June by a local company, Applied Research Northwest. Methodology and data quality information for both surveys is attached.

With regard to cleanup, I would call your attention to Question 2 of the Elway poll, which asked respondents to select the most important issue in waterfront redevelopment. "Making sure contaminants are safely disposed of" was far and away the top choice, with a ratio of nearly 3:1 over other options. This finding is echoed in Question 7 of the ARNW report. The ARNW survey also amplified this basic finding by formulating the issue with a series of different questions. Question 3 of that report shows 4
that 81% of respondents said that "cleanup of mercury and other contaminants at the former Georgia-Pacific site" was either "extremely" (45%) or "very" (36%) important. Question 9 addresses support for a potential voter initiative "that would require the city to use all reasonable means to support the maximum amount of cleanup of contaminated sediments, including mercury, in the Whatcom Waterway . . ." 63% of respondents said they would have supported such a measure (42% "Strongly approve" and 21% "Somewhat approve.") Question 13 addresses the possible economic implications of passing a measure calling for a more thorough cleanup; 75% of respondents said their opinion would not change regardless of the fact that "the port would have to spend a good deal more money to do the maximum cleanup."

Incidentally, I would add that more than 6400 local citizens subsequently signed a petition to qualify the above-referenced initiative for November's ballot in Bellingham. The "Healthy Bay Initiative" called for "a cleanup plan that permanently removes the maximum amount of contaminated sediments, including mercury, from the Whatcom Waterway . . . unless technically impracticable." Copies of the signed petitions were delivered to Ecology by Mitch Friedman, our board president, in a meeting with Jay Manning last week. You are no doubt aware that the City of Bellingham sued to block the Healthy Bay Initiative in September, ultimately succeeding on technical grounds. Had the measure come to a vote, both the attached survey results and the relative ease with which the 6400 signatures were gathered last summer indicate it would have passed by a strong margin.

In addition to the public's clear desire for a thorough cleanup, the polls touch on another important point. I realize that Ecology's official position is not to take a stand on land-use decisions. In the case of the ASB lagoon, however, it is clear that potential land use is a key factor in determining sediment disposal options and overall cleanup costs. Given this unavoidable fact, together with the equally salient fact that the "land owner" in the present case is a tax-supported public agency, it would seem that the public's opinion about how our downtown waterfront property is to be used should be entirely relevant to Ecology's analysis of the alternatives under MTCA regulations. On the question of how 5
"the old Georgia-Pacific wastewater lagoon would be used," the Elway poll found that 56% of respondents preferred a plan that would "use the area for a large central park" as opposed to 30% who would "use the area for a marina." ARNW repeated this query in Question 16: 48% of those respondents preferred a park; 28% a marina; and 13% a combination of the two. I need hardly point out that, regardless of what our elected representatives have requested, both surveys confirm significant public support for the 6
ASB to be used in a way that is compatible with Alternative 3, or with some variation that likewise would use the lagoon as a sediment disposal site.

In sum, the enclosed surveys indicate a high degree of public concern about the cleanup and clear support for plan that removes the maximum amount of contaminated sediments from the Whatcom Waterway, regardless of the higher cost of such a plan. Moreover, both surveys suggest that there is reason to question the degree to which officially sanctioned land use proposals actually reflect the desires of the local citizenry, who, after all, are the legitimate owners of the property. I urge you to re-evaluate the #5-A
MTCA rankings of each of the alternatives, taking this important information into account.

Sincerely,

Anna Hall Evans
Acting Director
Bellingham Bay Foundation

The Elway Poll

# PROPRIETARY REPORT

## Bellingham Bay Foundation

**APRIL 2006**



The information contained herein are the results of proprietary questions included in "The Elway Poll" survey at the request of the sponsor. Elway Research does not encourage publication of these results. However, in accordance with the standards of the American Association for Public Opinion Research, any release of this material must clearly state the following:

1. The findings are not those of "The Elway Poll" but are results of questions that were written and paid for by the sponsor and inserted as a proprietary question in "The Elway Poll";
2. The name of the organization that paid for the questions;
3. The size and composition of the sample (provided on "Sample Profile" page);
4. The margin of sampling error; and
5. The dates of the interviewing.

Elway Research, Inc. reserves the right to correct any misinformation or misimpression resulting from a public release of findings which does not include this information.

7107 Greenwood Ave N. Seattle, WA 98103 (206) 264-1500 Fax 264-0301

The Elway Poll

## METHODOLOGY

| | |
|---|---|
| **SAMPLE:** | 250 Registered voters in Whatcom County |
| **TECHNIQUE:** | Telephone Survey |
| **FIELD DATES:** | April 20-24, 2006 |
| **MARGIN OF ERROR:** | The overall margin of sampling error is ±6.2% at the 95% confidence interval. That is, in theory, had this same survey been conducted 100 times, in 95 of those times the results would be within ±6.2% of the results reported here. |
| **DATA COLLECTION:** | Calls were made during weekday evenings and weekend days. All interviews were conducted from a central location by trained, professional interviewers under supervision. Questionnaires were edited for completeness, and a percentage of each interviewer's call was re-called for verification. |

It must be kept in mind that survey research cannot predict the future. Although great care and the most rigorous methods available were employed in the design, execution and analysis of this survey, these results can be interpreted only as representing the answers given by these respondents to these questions at the time they completed the survey.

The Elway Poll

## SAMPLE PROFILE

In interpreting these findings, it is important to keep in mind the characteristics of the people actually interviewed. This table presents a profile of the 250 respondents in the survey.

Note: Here and throughout this report, percentages may not add to 100%, because of rounding.

| | | |
|---|---|---|
| GENDER | Male | 50% |
| | Female | 50% |
| AGE | 18-35 | 8% |
| | 36-50 | 26% |
| | 51-64 | 28% |
| | 65+ | 35% |
| EMPLOYMENT STATUS | | |
| | Self Employed | 13% |
| | Public Sector | 18% |
| | Private Sector | 20% |
| | Not Currently Employed | 7% |
| | Student | 2% |
| | Retired | 39% |
| INCOME | $25,000 or less | 14% |
| | $25 to $50,000 | 23% |
| | $50 to 75,000 | 19% |
| | Over $75,000 | 20% |
| | NO ANSWER | 23% |

The Elway Poll

**QUESTION WORDING**
**With Response Data**

# BELLINGHAM BAY FOUNDATION
# TOPLINE REPORT

| | |
|---|---|
| **SAMPLE:** | 250 registered voters in Whatcom County |
| **MARGIN of ERROR:** | ±6.2% |
| **FIELD DATES:** | April 20-24, 2006 |

**VOTEHIST:** 0: **16** 1: **14** 2: **20** 3: **20** 4: **30**

**GENDER:** MALE...**50** FEMALE...**50**

1. And do you live inside the city limits of Bellingham?

YES...**48**
NO...**52**
[DK/NA]...**1**

2. The Port of Bellingham and the City of Bellingham are working together to redevelop the Georgia Pacific site. The community is being asked to weigh in on a master plan for the site. Which of the following issues is most important to you, personally, as the Georgia Pacific mill site is redeveloped?

ROTATE

Making sure that contaminants are safely disposed of...**49**
Meeting the needs of boaters...**8**
Creating large open space for recreation and stormwater treatment...**16**
Creating the best possible access to the water from downtown...**17**
DK/NA...**10**

3. The biggest difference between various proposals for the old Georgia Pacific is in how the wastewater lagoon would be used. Do you prefer a plan that would...

ROTATE

Use this area as a large central park...**56**
Use the area for a new marina...**30**
DK/NA...**14**

4. Whom do you trust more to represent your interests as the Georgia Pacific property is redeveloped?

ROTATE
The Bellingham City Government...**13**
The Port Commissioners...**18**
Local Citizen's Groups, like the Bay Foundation...**53**
DK/NA...**16**

---

5. I have just a few last questions for our statistical analysis. How old are you?

18-35...**8**
36-50...**26**
51-64...**28**
65+...**35**
NA...**3**

6. Which of these the following best describes you at this time? Are you. . .

Self-employed or business owner...**13**
employed in the **public sector**, like a governmental agency or educational institution...**18**
employed in **private business**...**20**
Not Working Right Now...**7**
Student...**2**
Retired...**39**
DK/NA...**2**

7. Finally, I am going to list four broad categories. Just stop me when I get to the category that best describes your approximate household income - before taxes - for this year.

ROTATE TOP/BOTTOM
$25,000 or less...**14**
$25 to 50,000...**23**
$50 to 75,000...**19**
Over $75,000...**20**
**[DO NOT READ**: NO ANSWER]...**23**

The Elway Poll

# CROSSTABULATION TABLES

## READING THE CROSSTABULATION TABLES

The crosstabulations are presented in a "banner table" format. Categories of respondents (e.g., "Age," "Gender") are listed across the top of each page (the "banner"). There are several "banners".

The questions asked in the survey are listed down the left margin. They are presented in questionnaire order. The key in the upper left corner of the table indicates which questions are found on each page.

The figures in each cell are raw numbers and percentages based on the number of respondents in the category at the head of the column.

By reading across the rows, one can compare answers to a question given by the different categories of respondents.

| | TOTAL | GENDER | | AGE | | | VOTEHIST | | |
|---|---|---|---|---|---|---|---|---|---|
| | (N=) | Male | Female | 18-50 | 51-64 | 65+ | 0-1 | 2-3 | 4 |
| TOTAL (N=) | 250 100 | 125 100 | 125 100 | 85 100 | 70 100 | 87 100 | 74 100 | 100 100 | 76 100 |
| [1] BHAM CITY LIMITS | | | | | | | | | |
| Yes | 119 48% | 69 55% | 50 40% | 42 49% | 30 43% | 43 49% | 37 50% | 36 36% | 46 61% |
| No | 129 52% | 54 43% | 75 60% | 43 51% | 39 56% | 43 49% | 36 49% | 64 64% | 29 38% |
| DKNA | 2 1% | 2 2% | 0 0% | 0 0% | 1 1% | 1 1% | 1 1% | 0 0% | 1 1% |
| [2] IMPORTANT ISSUES | | | | | | | | | |
| Contaminants Disposed | 122 49% | 55 44% | 67 54% | 50 59% | 34 49% | 34 39% | 44 59% | 41 41% | 37 49% |
| Needs of Boaters | 20 8% | 12 10% | 8 6% | 6 7% | 8 11% | 6 7% | 3 4% | 8 8% | 9 12% |
| Open Space | 40 16% | 20 16% | 20 16% | 12 14% | 12 17% | 15 17% | 11 15% | 20 20% | 9 12% |
| Access from Downtown | 42 17% | 24 19% | 18 14% | 13 15% | 12 17% | 16 18% | 11 15% | 17 17% | 14 18% |
| DKNA | 26 10% | 14 11% | 12 10% | 4 5% | 4 6% | 16 18% | 5 7% | 14 14% | 7 9% |
| [3] PREFERRED PLAN | | | | | | | | | |
| Large Central Park | 139 56% | 67 54% | 72 58% | 52 61% | 39 56% | 43 49% | 47 64% | 61 61% | 31 41% |
| New Marina | 76 30% | 44 35% | 32 26% | 26 31% | 24 34% | 26 30% | 20 27% | 27 27% | 29 38% |
| DKNA | 35 14% | 14 11% | 21 17% | 7 8% | 7 10% | 18 21% | 7 9% | 12 12% | 16 21% |
| [4] WHOM TRUST MORE | | | | | | | | | |
| Bham City Govt | 34 14% | 22 18% | 12 10% | 22 26% | 7 10% | 5 6% | 11 15% | 12 12% | 11 14% |
| Port Commissioners | 45 18% | 26 21% | 19 15% | 15 18% | 16 23% | 14 16% | 14 19% | 18 18% | 13 17% |
| Citizen Grps/Bay Foundation | 132 53% | 62 50% | 70 56% | 40 47% | 38 54% | 49 56% | 40 54% | 50 50% | 42 55% |
| DKNA | 39 16% | 15 12% | 24 19% | 8 9% | 9 13% | 19 22% | 9 12% | 20 20% | 10 13% |

| | TOTAL | EMPLOYMENT | | | | | INCOME | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (N=) | Self | Private | Public | Not Empl | Retired | <=$25K | $25-50K | $50-75K | >$75K |
| TOTAL (N=) | 250 100 | 32 100 | 44 100 | 49 100 | 22 100 | 98 100 | 36 100 | 58 100 | 47 100 | 51 100 |
| [1] BHAM CITY LIMITS | | | | | | | | | | |
| Yes | 119 48% | 15 47% | 24 55% | 23 47% | 11 50% | 44 45% | 23 64% | 20 34% | 24 51% | 29 57% |
| No | 129 52% | 17 53% | 19 43% | 26 53% | 11 50% | 53 54% | 13 36% | 38 66% | 23 49% | 22 43% |
| DKNA | 2 1% | 0 0% | 1 2% | 0 0% | 0 0% | 1 1% | 0 0% | 0 0% | 0 0% | 0 0% |
| [2] IMPORTANT ISSUES | | | | | | | | | | |
| Contaminants Disposed | 122 49% | 15 47% | 23 52% | 28 57% | 11 50% | 41 42% | 16 44% | 34 59% | 25 53% | 19 37% |
| Needs of Boaters | 20 8% | 4 13% | 3 7% | 4 8% | 2 9% | 7 7% | 2 6% | 2 3% | 3 6% | 7 14% |
| Open Space | 40 16% | 4 13% | 6 14% | 6 12% | 4 18% | 19 19% | 10 28% | 6 10% | 5 11% | 11 22% |
| Access from Downtown | 42 17% | 6 19% | 8 18% | 8 16% | 4 18% | 16 16% | 6 17% | 11 19% | 8 17% | 11 22% |
| DKNA | 26 10% | 3 9% | 4 9% | 3 6% | 1 5% | 15 15% | 2 6% | 5 9% | 6 13% | 3 6% |
| [3] PREFERRED PLAN | | | | | | | | | | |
| Large Central Park | 139 56% | 17 53% | 29 66% | 29 59% | 14 64% | 47 48% | 24 67% | 31 53% | 25 53% | 28 55% |
| New Marina | 76 30% | 14 44% | 11 25% | 13 27% | 4 18% | 33 34% | 6 17% | 17 29% | 18 38% | 18 35% |
| DKNA | 35 14% | 1 3% | 4 9% | 7 14% | 4 18% | 18 18% | 6 17% | 10 17% | 4 9% | 5 10% |
| [4] WHOM TRUST MORE | | | | | | | | | | |
| Bham City Govt | 34 14% | 6 19% | 8 18% | 9 18% | 4 18% | 6 6% | 5 14% | 2 3% | 15 32% | 8 16% |
| Port Commissioners | 45 18% | 8 25% | 9 20% | 10 20% | 2 9% | 16 16% | 4 11% | 14 24% | 7 15% | 10 20% |
| Citizen Grps/Bay Foundation | 132 53% | 14 44% | 19 43% | 25 51% | 14 64% | 57 58% | 22 61% | 35 60% | 22 47% | 26 51% |
| DKNA | 39 16% | 4 13% | 8 18% | 5 10% | 2 9% | 19 19% | 5 14% | 7 12% | 3 6% | 7 14% |

| | TOTAL | | BHAM CITY LIMITS | | | | PREFERRED PLAN | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (N=) | | IN CITY | | NOT | | Large Central Park | | New Marina | |
| TOTAL (N=) | 250 | 100% | 119 | 100% | 129 | 100% | 139 | 100% | 76 | 100% |
| [1] BHAM CITY LIMITS | | | | | | | | | | |
| Yes | 119 | 48% | 119 | 100% | 0 | 0% | 68 | 49% | 34 | 45% |
| No | 129 | 52% | 0 | 0% | 129 | 100% | 69 | 50% | 42 | 55% |
| DKNA | 2 | 1% | 0 | 0% | 0 | 0% | 2 | 1% | 0 | 0% |
| [2] IMPORTANT ISSUES | | | | | | | | | | |
| Contaminants Disposed | 122 | 49% | 49 | 41% | 72 | 56% | 78 | 56% | 29 | 38% |
| Needs of Boaters | 20 | 8% | 13 | 11% | 7 | 5% | 2 | 1% | 15 | 20% |
| Open Space | 40 | 16% | 25 | 21% | 15 | 12% | 30 | 22% | 7 | 9% |
| Access from Downtown | 42 | 17% | 23 | 19% | 19 | 15% | 19 | 14% | 16 | 21% |
| DKNA | 26 | 10% | 9 | 8% | 16 | 12% | 10 | 7% | 9 | 12% |
| [3] PREFERRED PLAN | | | | | | | | | | |
| Large Central Park | 139 | 56% | 68 | 57% | 69 | 53% | 139 | 100% | 0 | 0% |
| New Marina | 76 | 30% | 34 | 29% | 42 | 33% | 0 | 0% | 76 | 100% |
| DKNA | 35 | 14% | 17 | 14% | 18 | 14% | 0 | 0% | 0 | 0% |
| [4] WHOM TRUST MORE | | | | | | | | | | |
| Bham City Govt | 34 | 14% | 16 | 13% | 18 | 14% | 16 | 12% | 14 | 18% |
| Port Commissioners | 45 | 18% | 21 | 18% | 24 | 19% | 11 | 8% | 32 | 42% |
| Citizen Grps/Bay Foundation | 132 | 53% | 67 | 56% | 64 | 50% | 93 | 67% | 23 | 30% |
| DKNA | 39 | 16% | 15 | 13% | 23 | 18% | 19 | 14% | 7 | 9% |

REPORT

# Bellingham Voter Poll

**June, 2006** 1

**Pamela M. M. Jull, PhD**
**Aaron Ignac, MS**
**Lucas Snider**

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# INTRODUCTION

In June, 2006 Applied Research Northwest conducted interviews with 400 randomly selected registered voters in Bellingham, Washington. The survey questions centered around citizens' perceptions of and preferences for development planning at the former Georgia Pacific waterfront site. The purpose of the survey was to estimate voter opinions regarding several of the proposed aspects of clean up and uses of the site and to determine the verbiage for a potential voter initiative. Dr. Jull at ARN constructed the survey questions with input from key informants of the Bellingham Bay Foundation, a non-profit group focused on environmental issues. This report contains the results of the survey.

## METHODOLOGY & DATA QUALITY

Four hundred surveys were completed from randomly selected active voters living in the Bellingham City limits. The response rate for the study was 39%, meaning that of the 1027 valid contacts that were made, 39% responded to the survey. Interviewers attempted to reach voters three times, at different times of day and different days of the week. After three attempts, the case was counted as an invalid contact. The average survey lasted under 10 minutes.

The sampled respondents very closely resemble the characteristics of the population in terms of age and sex distributions, though the youngest age group (18-44) is under represented in the findings.

**Comparison of Sample and Demographic Characteristics.**

| | Age 18-44 | age 45-59 | age 60+ | males | females |
|---|---|---|---|---|---|
| Number | 72 | 160 | 168 | 189 | 211 |
| % of Sample | 18% | 40% | 42% | 47% | 53% |
| % of population | 33% | 33% | 33% | 47% | 53% |

| Call Results Summary | total |
|---|---|
| Completes | 400 |
| Partial Completes | 3 |
| Soft Refusal * | 206 |
| Refused | 113 |
| No Answer/Machine/Busy | 221 |
| Callback | 84 |
| Total Valid Contact | 1027 |
| Bad number | 398 |
| Does Not Recall Visit | 8 |
| Unable - Language | 5 |
| Unable - Physical/Mental | 70 |
| Deceased | 2 |
| Not Qualified | 15 |
| Already Responded | 1 |
| Max Attempts (3x) | 849 |
| Total Invalid Contacts | 1348 |
| Total | 2375 |
| Response Rate (completes/valid) | 39% |
| Average Length of Survey | 08:47 |

*Soft refusal means that the responded hung up before hearing why we were calling.

## ABOUT ARN

Applied Research Northwest is a social research organization founded by two PhD-level Sociologists. ARN was started in order to provide social survey research using the standards employed by the most prestigious research institutions.

The company has maintained a record of steady service, providing polling, program evaluation and planning research for a variety of companies, non-profits, city, county and state agencies, as well as academic researchers and health care organizations.

# RESULTS

This section presents the exact wording of the items and responses from the voter poll without commentary.

## INTRO:

Hello, my name is $I. May I speak with <FIRST> <LAST>? The Bellingham Bay Foundation is conducting a community poll to learn people's priorities and concerns regarding the clean up of mercury and toxins at the Georgia Pacific waterfront site. Your responses are completely confidential, and you can stop the interview at any time. First, are you a registered voter living within the Bellingham city limits? Do you have a few minutes to provide your input?

FAQs: [How long is the survey?] The survey will take less than ten minutes. [How much will this all cost / Who will pay for it?] Right now, there are no good estimates for how much some of the clean up will cost. The Port has many options for funding the clean up, but nothing has been decided yet. [How did you get my name/number?] We got a random list of potential voters from a national company called Voter Contact Services. [Who is sponsoring / paying for the survey?] It is being sponsored by the Bellingham Bay Foundation, a non-partisan, non-profit community group. [Who are you? Where are you calling from?] Applied Research Northwest is a privately owned social research firm here in Bellingham. [Will the results be made public?] The findings from the survey will be made publicly available in the media and on the Bay Foundation website. The information will be given to the City to aid their decision making on the project. [What is the purpose of this study?] The purpose of the survey is to provide the City with good data about what residents of Bellingham want for the redevelopment.

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Able to Continue | 01 | 400 | 100% |
| Unable to Continue | 02 | 0 | 0% |
| New Telephone Number | 03 | 0 | 0% |
| Not a registered voter within city limits | 16 | 0 | 0% |

## INFO1:

Before I begin, let me explain that there are three areas at the site - the land where the GP mill site is, a waste water treatment lagoon, and the Whatcom Waterway that runs between the land and the treatment lagoon. When I refer to the site, I'm talking about all three.

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| [Hit 'enter' to continue] | Y | 400 | 100% |

## Q1:

How much have you heard or read about the future development plans for the former site of Georgia Pacific? Some people are calling it the Bellingham Bay Waterfront Redevelopment Site. Would you say you've heard...

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| A great deal | 4 | 115 | 29% |
| Some | 3 | 173 | 43% |
| A little | 2 | 85 | 21% |
| Nothing at all | 1 | 24 | 6% |
| Don't know (do not read) | 7 | 2 | 1% |
| Refused (do not read) | 9 | 1 | 0% |

## Q2:

How much have you heard or read about mercury and other toxic contaminants left at the former Georgia Pacific site? Would you say...

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| A great deal | 4 | 91 | 23% |
| Some | 3 | 168 | 42% |
| A little | 2 | 86 | 22% |
| Nothing at all | 1 | 49 | 12% |
| Don't know (do not read) | 7 | 1 | 0% |
| Refused (do not read) | 9 | 5 | 1% |

## Q3:

In your opinion, how important is the cleanup of mercury and other contaminants at the former Georgia Pacific site? Would you say...

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Extremely | 5 | 178 | 45% |
| Very | 4 | 142 | 36% |
| Somewhat | 3 | 44 | 11% |
| A little | 2 | 12 | 3% |
| Not at all important | 1 | 5 | 1% |
| Don't know (do not read) | 7 | 13 | 3% |
| Refused (do not read) | 9 | 6 | 2% |

## Q4:

How would you rate the amount of open public process there has been in deciding what will happen at that site? Would you say it's been...

| | | | |
|---|---|---|---|
| N = | | 376 | 100% |
| Excellent | 5 | 43 | 11% |
| Good | 4 | 117 | 31% |
| Fair | 3 | 115 | 31% |
| Poor | 2 | 39 | 10% |
| Very poor | 1 | 8 | 2% |
| Don't know (do not read) | 7 | 49 | 13% |
| Refused (do not read) | 9 | 5 | 1% |

## Q5:

Whom do you think best represents your interests and values regarding the redevelopment of the former Georgia Pacific site? Would you say...

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| the Bellingham City Council | 1 | 44 | 11% |
| the Mayor of Bellingham | 2 | 9 | 2% |
| the Port Commissioners | 3 | 69 | 17% |
| local Citizen's groups, like the Bellingham Bay Foundation | 4 | 209 | 52% |
| None of the above (do not read) | 6 | 19 | 5% |
| Don't know (do not read) | 7 | 44 | 11% |
| Refused (do not read) | 9 | 6 | 2% |

## Q6:

And who do you think is NEXT best at representing your interests and values? [regarding the redevelopment of the former Georgia Pacific site?]

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| the Bellingham City Council | 1 | 133 | 33% |
| the Mayor of Bellingham | 2 | 27 | 7% |
| the Port Commissioners | 3 | 54 | 14% |
| local Citizen's groups, like the Bellingham Bay Foundation | 4 | 57 | 14% |
| None of the above (do not read) | 6 | 53 | 13% |
| Don't know (do not read) | 7 | 61 | 15% |
| Refused (do not read) | 9 | 15 | 4% |

## Q7:

The Port of Bellingham and the City of Bellingham are working together to redevelop the Georgia Pacific site. The community is being asked to weigh in on a master plan for the site. Which of the following issues is most important to you, personally, as the Georgia Pacific mill site is redeveloped?

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Making sure that contaminants are safely disposed of | 1 | 213 | 53% |
| Meeting the strong demand for more marinas | 2 | 34 | 9% |
| Creating a large open space for recreation | 3 | 78 | 20% |
| Effectively treating storm water runoff | 4 | 29 | 7% |
| None of the above (do not read) | 6 | 18 | 5% |
| Don't know (do not read) | 7 | 13 | 3% |
| Refused (do not read) | 9 | 15 | 4% |

## INFO2:

Currently the Port is planning to clean up the former mill site to exceed industrial standards, but it would not meet residential standards for clean up. The City is planning to permit residences, schools, shops, restaurants and businesses at the site. State documents say that clean up to industrial standards means that people don't normally live on the site and the public is generally not allowed.

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| [Hit 'enter' to continue] | Y | 400 | 100% |

## Q8:

Given all this, do you think there should be a higher level of cleanup required than what is currently planned, such as to residential standards?

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Yes | 2 | 289 | 72% |
| No | 1 | 71 | 18% |
| Don't know (do not read) | 7 | 28 | 7% |
| Refused (do not read) | 9 | 12 | 3% |

## Q9:

A voter initiative is being proposed that would require the city to use all reasonable means to support the maximum amount of cleanup of contaminated sediments, including mercury, in the Whatcom Waterway and to clean up the former mill site to residential standards. Would you approve or reject an initiative like that if it were on the November ballot?

## Q10:

Would you say that you strongly <Q9> it or somewhat <Q9> it?

| | | |
|---|---|---|
| N = | 400 | 100% |
| Strongly Approve | 169 | 42% |
| Somewhat Approve | 85 | 21% |
| Somewhat Reject | 25 | 6% |
| Strongly Reject | 31 | 8% |
| Don't know (do not read) | 70 | 18% |
| Refused (do not read) | 20 | 5% |

## Q11:

Can you tell me more about that?

| | | | |
|---|---|---|---|
| N = | | 195 | 100% |
| [Hit 'enter' to continue] | Y | 191 | 98% |
| Refused (do not read) | 1 | 4 | 2% |

## Q13:

Passing the initiative would mean that the Port will have to spend a good deal more money to do the maximum clean up. Would that change your mind about the initiative?

| | | | |
|---|---|---|---|
| N = | | 285 | 100% |
| Yes | 2 | 35 | 12% |
| No | 1 | 213 | 75% |
| Don't know (do not read) | 7 | 29 | 10% |
| Refused (do not read) | 9 | 8 | 3% |

## Q13A:

Would you be more supportive or less supportive?

| | | | |
|---|---|---|---|
| N = | | 35 | 100% |
| More supportive | 2 | 8 | 23% |
| Less supportive | 1 | 22 | 63% |
| Don't know (do not read) | 7 | 3 | 9% |
| Not applicable (do not read) | 8 | 0 | 0% |
| Refused (do not read) | 9 | 2 | 6% |

## Q14:

With maximum clean up of the site, the land value would be substantially higher, helping to offset the clean up costs. Would that change your mind about the initiative?

| | | | |
|---|---|---|---|
| N = | | 285 | 100% |
| Yes | 2 | 27 | 9% |
| No | 1 | 214 | 75% |
| Don't know (do not read) | 7 | 33 | 12% |
| Refused (do not read) | 9 | 11 | 4% |

## Q14A:

Would you be more supportive or less supportive?

| | | | |
|---|---|---|---|
| N = | | 27 | 100% |
| More supportive | 2 | 15 | 56% |
| Less supportive | 1 | 7 | 26% |
| Don't know (do not read) | 7 | 4 | 15% |
| Not applicable (do not read) | 8 | 1 | 4% |
| Refused (do not read) | 9 | 0 | 0% |

## Q15:

Some people think that when it comes to the site, clean up comes first. Would you...

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Strongly agree | 5 | 236 | 59% |
| Somewhat agree | 4 | 97 | 24% |
| Neither agree or disagree | 3 | 27 | 7% |
| Somewhat disagree | 2 | 20 | 5% |
| or Strongly disagree that clean up comes first | 1 | 8 | 2% |
| Don't know (do not read) | 7 | 3 | 1% |
| Refused (do not read) | 9 | 9 | 2% |

## Q16:

Whether the contaminants are removed or not, would your preference for the wastewater treatment lagoon be to have a Marina or a Park?

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Park | 1 | 192 | 48% |
| Marina | 2 | 111 | 28% |
| Combination of both (do not read) | 3 | 51 | 13% |
| Depends (do not read) | 4 | 9 | 2% |
| No preference (do not read) | 5 | 10 | 3% |
| Neither (do not read) | 6 | 6 | 2% |
| Don't know (do not read) | 7 | 19 | 5% |
| Refused (do not read) | 9 | 2 | 1% |

## Q17:

Finally, the current Port Commission consists of three officials elected by Whatcom County Voters in three districts. If the Port Commission had five elected officials, there would be stronger representation of different interests on the commission. Would you approve or reject a proposal to increase the Port Commission from three to five commissioners at a cost of no more than $13,500 per year total?

## Q18:

Would you say that you strongly <Q17> it or somewhat <Q17> it?

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Strongly Approve | 2 | 142 | 36% |
| Somewhat Approve | 2 | 93 | 23% |
| Somewhat Reject | 1 | 42 | 11% |
| Strongly Reject | 1 | 70 | 18% |
| Refused (do not read) | 9 | 53 | 13% |

## Q19:

The Bellingham Bay Foundation may be hosting some discussion groups about the clean up and redesign for the former Georgia Pacific site. Would you like to be contacted about those groups when they are scheduled? Your responses to this survey will still be confidential.

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Yes | 2 | 156 | 39% |
| No | 1 | 204 | 51% |
| Don't know (do not read) | 7 | 2 | 1% |
| Refused (do not read) | 9 | 38 | 10% |

## Q20:

How would you prefer to be contacted: by phone, mail or email?

| | | | |
|---|---|---|---|
| N = | | 156 | 100% |
| Phone | 1 | 44 | 28% |
| Mail -- get address and verify | 2 | 64 | 41% |
| Email -- get address and verify | 3 | 48 | 31% |
| Don't know (do not read) | 7 | 0 | 0% |
| Refused (do not read) | 9 | 0 | 0% |

## Q21:

The Bellingham Bay Foundation will be gathering signatures to put their initiative on the November ballot. Would you be interested in helping with the signature gathering?

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Yes | 2 | 25 | 6% |
| No | 1 | 285 | 71% |
| Don't know (do not read) | 7 | 7 | 2% |
| Refused (do not read) | 9 | 83 | 21% |

## Q22:

May I have your permission to give the foundation your name and phone number for that purpose? Your survey responses will still be confidential.

| | | | |
|---|---|---|---|
| N = | | 32 | 100% |
| Yes | 2 | 31 | 97% |
| No | 1 | 1 | 3% |
| Don't know (do not read) | 7 | 0 | 0% |
| Refused (do not read) | 9 | 0 | 0% |

## QCMT:

[Comment Box: Do NOT Prompt]

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Hit Enter to Continue | Y | 400 | 100% |

## INT98:

I'm sorry, but this survey is only for registered voters that live within the Bellingham city limits. Have a good day/evening.

| | | | |
|---|---|---|---|
| N = | | 0 | 100% |
| Not Qualified | 16 | 0 | 0% |

## INT99:

That's the end of the survey, <FIRST>. Thank you very much for your time. Have a good day/evening.

| | | | |
|---|---|---|---|
| N = | | 400 | 100% |
| Complete | 08 | 400 | 100% |

# Cleanup Comes First: A Healthy Bay Initiative

WHEREAS, the beneficial stewardship of the land, air, and water is a solemn obligation of the present generation for the benefit of future generations;

WHEREAS, the marine waters, sediments and shorelines in Bellingham Bay have been polluted with hazardous chemicals and the opportunity now exists to perform a substantial cleanup of those waters, sediments and shorelines;

WHEREAS, public health is a priority and today's citizens hold the responsibility for removing persistent contaminants rather than leaving them behind for our children and grandchildren to address;

WHEREAS, the community expects a mix of uses at the former mill site, including residential, commercial, industrial, educational and park, all of which contribute to the prosperity of our downtown;

WHEREAS, performing a thorough cleanup is essential to providing a secure investment climate for waterfront redevelopment and restoration;

WHEREAS, public funds for cleanup should be spent where the maximum public and environmental health benefits will occur;

NOW, THEREFORE,

The Citizens of the City of Bellingham do hereby resolve and enact the following legislation by their exercise of the initiative process:

**Section 1.**

It is hereby established as the policy of the City of Bellingham that the paramount concern for the Bellingham Bay waterfront is permanent cleanup of mercury and other persistent toxic contaminants. The City shall use all reasonable means available to persuade the Department of Ecology and other stakeholders to approve a cleanup plan that permanently removes the maximum amount of contaminated sediments, including mercury, from the Whatcom Waterway and establishes that the former mill site south of the Whatcom Waterway shall be cleaned to unrestricted cleanup standards, unless technically impracticable. The City shall not in any way advocate for or support a cleanup plan that leaves behind significant concentrations of mercury or other contaminants in the Whatcom Waterway or that cleans the former Georgia-Pacific mill site south of the Whatcom Waterway only to an industrial standard.

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**From:** Anna Evans [mailto:aevans@bbayf.org]
**Sent:** Monday, December 18, 2006 4:40 PM
**To:** McInerney, Lucy (ECY)
**Cc:** 'Patty'; 'Greg Glass'; 'Alice Clark'; 'Anne-Marie Faiola'; 'Bob Kelly'; 'Darrell Hillaire'; 'David Syre'; 'Elisabeth Britt'; 'Frances Badgett'; 'George Dyson'; 'John D'Onofrio'; 'Lenny Dixon'; 'Lisa McShane'; 'Mitch Friedman'; 'Murphy Evans'
**Subject:** Waterway RI/FS

Dear Ms. McInerney,

In addition to the myriad detailed analyses regarding the Whatcom Waterway RI/FS, I'd like to observe that the "range" of cleanup alternatives seems hardly a range at all. Alternatives 1 and 8 are universally regarded as place holders representing two impractical extremes (ie: "do almost nothing" and "do almost everything"). Alternatives 2, 3, 4 and 7 have been automatically downgraded under MTCA regulations because of land-use and habitat considerations (Alternatives 2, 3, and 4 fail to accommodate the port's planned marina and Alternative 7 proposes to dredge and retrofit the inner waterway to according to specifications for a deep-draft shipping channel). This leaves only Alternatives 5 & 6, both of which meet land-use and habitat restoration proposals and both of which are "preferred." It is also notable that both are in line with so-called "Alternative K," which I'm sure you're aware the Port of Bellingham and Georgia-Pacific jointly agreed to promote when they signed the Purchase and Sale Agreement for the property.

I would hope that in the interests of preserving the integrity, authenticity and credibility of the public process, your agency will insist that more alternatives are developed. Surely 15
it is both possible and wise for us to consider a true "range" of alternatives that satisfy land-use and habitat concerns as well as the public's expressed desire for a more thorough removal of mercury-contaminated sediments from the site as a whole.

Thank you for your hard work on this project, and for your consideration of the public's concerns.

Sincerely,

Anna Hall Evans
Bellingham Bay Foundation
1208 Bay Street, Suite 101
Bellingham, WA 98225

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# BELLINGHAM BAY FOUNDATION

1208 Bay Street, Suite 101 • Bellingham, WA 98225
(360) 527-2733 • fax (360) 527-2871
website: www.bbayf.org • email: info@bbayf.org

Lucille T. McInerney, P E
Department of Ecology
Northwest Regional Office
3190 160th Avenue
Bellevue, WA 98008-5452

December 18, 2006



Dear Ms. McInerney,

Enclosed please find two documents we'd like to submit as part of the Bay Foundation's response to the Whatcom Waterway RI/FS.

The "Healthy Bay Resolution" has been formally adopted by a unanimous vote of
our board of directors as a means of voicing the Bay Foundation's strong support for a 17
cleanup that is both more protective and more permanent than that represented by the current preferred alternatives Based on the results of polls conducted by our organization (submitted in a separate mailing) as well as our extensive community outreach, we believe the spirit of this resolution reflects a general consensus among local citizens It is clear that the people of Bellingham want confidence that the Whatcom Waterway cleanup will be highly protective of human and environmental health for many generations to come

The resolution is supported by our "Healthy Bay Principles," a set of goals for the
cleanup which elaborates on themes introduced in the resolution, identifies objectives and 18
details specific options for implementation The Healthy Bay Principles were developed in consultation with Greg Glass, whose insight and expertise were critical to our analysis.

We urge a reevaluation of the alternatives and in light of our community's clear 19
call for a cleanup that we all can agree is more permanent and more protective than those currently proposed Thank you for your thoughtful consideration of our request

Sincerely,

Anna Hall Evans
Acting Director
Bellingham Bay Foundation

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DEC 18 2006
DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

# HEALTHY BAY RESOLUTION

BELLINGHAM BAY FOUNDATION

WHEREAS, mercury left in the aquatic environment will persist indefinitely and present serious risks to human and ecological health;

WHEREAS, the standards for mercury may become more stringent as toxicological research on mercury is refined;

WHEREAS, the City of Bellingham's waterfront has been industrial for a century, leading to the contamination of the Whatcom Waterway and uplands with mercury, a persistent bioaccumulative toxin;

WHEREAS, prior to the construction of the Aerated Stabilization Basin, Georgia-Pacific released several pounds of mercury a day into the Whatcom Waterway;

WHEREAS, the RI/FS for the Whatcom Waterway is generated by the Port of Bellingham, with Ecology's approval;

WHEREAS, the citizens of Whatcom County support the permanent removal of the maximum amount of mercury from the Waterway and the former GP site, as evidenced by the 6400 signatures for the Healthy Bay Initiative—legislation that requested advocacy from the City of Bellingham for a better cleanup of the Whatcom Waterway and uplands of the former G-P site—and by polling data performed by the Bellingham Bay Foundation;

WHEREAS, participants in the Bellingham Bay Demonstration Pilot, including the Nooksack Tribe and Lummi Nation, recommended more dredging than currently advocated for by the Port of Bellingham and approved by Ecology, as well as the restoration of intertidal aquatic habitat;

WHEREAS, the Bellingham Bay Foundation, ReSources, People for Puget Sound, Washington Toxics Coalition, Conservation Northwest, Whatcom County Rainbow Coalition, Mt. Baker Sierra Club, Washington Conservation Voters, Olympic Environmental Council, and the Institute of Neurotoxicology and Neurological Disorders have signed a Statement of Principles calling for removal of mercury from our waterfront;

WE THEREFORE RESOLVE that we find the cleanup represented in the preferred remedial
alternatives of the Whatcom Waterway RI/FS do not offer enough permanent protection from
mercury nor adequate restoration of habitat within the Whatcom Waterway; that the permanent 21
removal of mercury from the Whatcom Waterway should be more widely considered than currently
represented in the preferred remedial alternatives, either by hydraulic or mechanical dredging; that a 22
local facility be available for hydraulic dredging; that given capping is part of the remediation of the
Whatcom Waterway, longer term and more frequent monitoring should be part of the scheduled
cleanup, and the costs of the caps' additional monitoring, repair, and maintenance should be part of 23
the RI/FS; that thicker capping than currently proposed should be considered, especially in concert
with the creation of intertidal habitat, as is consistent with future land use planning. We strongly 24
advocate that all Model Toxics Control Act funds be spent strictly for the remediation of
contamination to protect human and ecological health.

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*Bellingham Bay Foundation Board of Directors*

| | |
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| Mitch Friedman, President | 12-14-06 Date |
| Lisa McShane, Vice-President, Secretary | 12-11-06 Date |
| Anne-Marie Faiola, Treasurer | 12.14.06 Date |
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| George Dyson, Director | 12.15.06 Date |
| Murphy Evans, Director | 12-13-06 Date |
| Bob Kelly, Director | Date |
| David Syre, Director | 12-15-06 Date |

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# Healthy Bay Principles

## Principle 1

A more permanent, protective cleanup plan is required instead of the preferred remedial
alternatives More dredging and removal of contaminated sediments is needed, plus
conservatively designed in situ capping for any areas of remaining contamination.
Minimizing the amount of residual mercury contamination left in the waterway and
using thicker caps will reduce uncertainties in the long-term performance of the cleanup 27
actions. Thicker caps are consistent with a navigation channel, habitat improvements
and land use consistency.

### Objectives:

- To permanently remove the toxic legacy of mercury from the aquatic environment, as
  is indicated by the first three goals of the Bellingham Bay Demonstration Pilot: Goal
  1—Human Health and Safety: *Implement actions that will enhance the protection of human* 28
  *health.* Goal 2—Ecological Health: *Implement actions that will protect and improve the
  ecological health of the bay.* Goal 3—Protect and Restore Ecosystems: *Implement actions
  that will protect, restore, or enhance habitat components making up the bay's ecosystem*

- To increase confidence that mercury exposure from remaining contaminated sediments, resulting from both anticipated or unforeseen events and processes, will be effectively controlled for the long term.

- To increase the availability of healthy habitat without the risks associated with biomagnification. The goal is to develop a cleanup approach that will lead to a sustained healthy environment for the future, not just a temporary control of pollution.

- To ensure that marine life and people eating fish and shellfish are safe from mercury, a persistent and bioaccumulative contaminant

### Options for remedy and disposal:

The objective of removing more mercury from the waterway can be accomplished in several ways. Technical factors should be evaluated to select the most appropriate and beneficial approach.

Hydraulic dredging involves less resuspension of sediments than mechanical dredging
and is therefore preferred where it can be used effectively Debris, logs, and shoreline
features can interfere with hydraulic dredging. It also requires a contained space for
dewatering the dredged sediments. Either hydraulic or mechanical dredging can be 29
used to remove contaminated sediments. Possible approaches include:

a. Mechanically dredge areas of contaminated sediments, especially the inner Whatcom Waterway where mercury concentrations are comparatively elevated, and send the dredged material to an approved Subtitle D landfill. Dredge the ASB sludges, dewater them as required, and send them to an approved Subtitle D landfill, or cap them in place within the ASB

b Hydraulically or mechanically dredge areas of contaminated sediments, route them to 30
the ASB, and cap both the dredged materials and the ASB sludges in place.

c. Dredge the ASB sludges, dewater them as required, and send them to an approved Subtitle D landfill Hydraulically dredge areas of contaminated sediments and route
them to the ASB for dewatering, followed by removal and transport to an approved 31
Subtitle D landfill. Initial removal of the ASB sludges is likely to damage or remove the existing bentonite liner If technical evaluations determine that a liner is needed to use the ASB for temporary dewatering of hydraulically dredged sediments, reinstall a liner

d Determine dredging depths and areas based on the principle of minimizing residual 32
mercury contamination in sediments rather than primarily on navigation channel requirements. Incorporate significantly thicker caps (6 feet or more) in areas of
remaining sediment contamination to increase protectiveness. Thicker caps can also be 33
integrated into habitat improvements and consistent waterway/nearshore development options, while reducing the amount of mercury left in the waterway.

## Principle 2

An effective, long-term monitoring plan must be part of the cleanup actions, consistent 30
with the persistence of mercury in the marine environment Long-term monitoring should continue as long as necessary to detect mercury releases or impacts in the marine environment and to evaluate the continued effectiveness of containment measures (capping) Realistic costs for extended monitoring programs and required cap
maintenance and repair actions, or other future cleanup actions, need to be included in 31
the evaluation of alternatives. Monitoring costs should be proportionate to the
contamination left behind (i e areas that are more contaminated need more monitoring). 32

**Objectives:**

- To confirm continued protection of human and ecological health from potential adverse impacts from residually contaminated sediments

- To identify trends in environmental measures that could indicate ongoing releases and exposures, thereby providing an early warning system for potential future adverse impacts.

- To identify degradation in containment systems (caps) early enough to plan and carry out maintenance or remedial actions, or additional cleanup measures, to prevent releases of contaminants to the marine environment

- To properly account for long-term monitoring costs as well as future maintenance and repair costs and avoid bias in the comparisons among alternatives.

**Options for remedy:**

a. Recognize that the scope and duration of monitoring activities should reflect the conditions after cleanup actions are completed. Leaving more mercury in the waterway, and relying on thinner caps, increases future uncertainties and risks and should be accompanied by an enhanced monitoring program

b. Long term means long term. Given the persistence of mercury in the environment, the monitoring program must address a timeframe of at least decades.

c. An effective monitoring program should address multiple components of the
environment Among other things, it should monitor potential sources of
contaminants to the waterway (for example, uplands ground water and surface water 33
runoff), the mobility and flux of mercury from contaminated sediments into and
through engineered or natural caps, bioaccumulation of mercury through the food 34
web to indicator and consumed species, ecological communities in areas of residual
contamination, and the physical condition and continued effectiveness of caps

d. The number of locations monitored and the frequency of monitoring must be sufficient to provide representative information and to meet the objective of timely identification of trends or changes in conditions

e. Criteria should be established within the monitoring plans that identify trigger levels 35
for contingent actions. When evaluations of collected monitoring data show that such
trigger levels have been exceeded, modifications to the monitoring program or the
cleanup actions should be initiated Trigger levels could be set, for example, based on
upward trends in surface sediment mercury concentrations, trends in fish or shellfish
tissue levels, or cap erosion and thinning

f. Event-based triggers should also be incorporated into the monitoring plans. For example, modifications of the monitoring program may be justified after record storms or large earthquakes, especially if they approach or exceed assumptions used in design studies

g. Monitoring isn't something that can just be considered after a cleanup approach is selected. It is an important factor for the comparison of alternatives within the Feasibility Study Differences among the alternatives in monitoring costs—and equally critical, differences in the life-cycle costs for maintaining the effectiveness and protectiveness of caps—must be appropriately considered in comparing alternatives. Removing more mercury and using thicker caps reduces the likelihood of future deferred costs to maintain protectiveness, a cost benefit in comparison to other alternatives.

# Principle 3

All Model Toxics Control Act funds should be prioritized for remediation of 36 contamination to protect human and ecological health. With cost disproportionality a criterion for comparisons among alternatives, it is vital that funds go toward providing long-term protectiveness above all else

#12-K

**Northwest Computer**
1419 Cornwall Avenue Bellingham, WA 98225
(360) 734-3400 (800) 735-3410 Fax (360) 734-4882

December 18, 2006

RECEIVED
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DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

Dear Ms. McInemey,

Please accept these signatures as part of the public comment regarding the remediation of the Whatcom waterway.

We believe that they are representative of a compelling desire amongst the citizens of Bellingham and Whatcom County to clean the waterway to the highest standard possible (i.e. alternatives 3 or 7 where the mercury is *removed* rather than alternative 6 wherein it is capped). 37

There have been numerous opportunities to gauge this public sentiment. In an Elway poll taken in March, respondents indicated by a 3 to 1 margin that optimal disposal of contaminants was the most important aspect of waterfront redevelopment. In June, an Applied Research Northwest poll revealed that 81% of residents consider maximum cleanup of mercury to be either "extremely important" or "very important". In this poll, 73% indicated that they would support a "maximum" clean-up *regardless of cost.* 38

Of course, as you are undoubtedly aware, more than 6400 city residents also signed on to the Healthy Bay Initiative, which called for best possible clean up strategies. 39

As someone who has closely followed this process for the last several years, it seems obvious that the people of Whatcom county do not share the port's enthusiasm for what is seen as a compromised clean up strategy driven by economic gain for that agency. Those of us who live in Whatcom County take uncommon pride in our home and have earned a well-deserved reputation as people who place a very high premium on environmental stewardship. Thus, it is easy to see that alternative 6 does not satisfy the need or meet our clearly voiced standards.

I sincerely hope that the stated desire of DOE to honor the wishes of the community is sincere and sacrosanct.

Most Sincerely,

John D'Onofrio

President, Northwest Computer
Board of Directors, Bellingham Bay Foundation

# Cleanup, Not Cover up!

The current preferred alternatives for the Whatcom Waterway cleanup leave too much mercury in the waterway. This is not acceptable. We want the Department of Ecology to require the *removal* of mercury from the waterway as opposed to capping in place.

| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| NAOMI SUNDBERG | Naomi Sundberg | 303 Highland Dr. Bham 98225 | | | |
| Tim Smith | [illegible] | 1232 Roland B'ham 98229 | | | |
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| Mica Hartley | Mica Hartley | 1600 McKenzie Ave B'ham 98225 | " | " | |
| Roxanna Hubert | RJ Hubert | 1696 Sudden Valley Bham 98229 | | | |
| STEVE FARRO | [illegible] | 1306 23RD ST BELLINGHAM WA 9225 | | | |
| Kate Sovell | Kate Sovell | 2517 Peabody St B-ham 98225 | " | 98225 | |
| MONICA CASSIDY | [illegible] | 1437 IRIS LN BHAM - 98229 | | | |
| Alex Westcott | [illegible] | 303 Highland Dr | " | " | |
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| Printed Name | Signature | Address | City | Zip | email |
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| MARYSE ARNOLD | [illegible] | BOX 530 | SHAWNIGAN LAKE, BC CANADA | V0R 2W0 | N/A |
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| Heather Cowley | Heather [illegible] | 835 High St | B'ham | 98225 | |
| Nancy Knapp | Nancy Knapp | 237 N Forest | B'ham | 98225 | |
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| Susan Hass | S. Hass | 2628 Donovan Ave | Bell. | 98225 | none |
| Charlie Maliszewski | C. Maliszewski | 760 Old Samish | B'ham | 98229 | |
| CHERYL THOMPSON | [illegible] | 105 43RD St | B'ham | 29 | |
| MARIAN VOLKE | [illegible] | | B'ham | 98225 | marian_anakeisev@hotmail.com |
| Hugh Anthony | [illegible] | ~~[illegible]~~ 2200 Iron St. | B'ham | 98225 | |
| Dean Evenson | Dean [illegible] | Box 4472 | " | 98227 | |

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| rinted Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| David W. Fint | [illegible] | 5289 Breckenridge | Everson WA | 98247 | |
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| Arielle Stein | Arielle [illegible] | 3165 Barrell Spgs Rd | Bow | 98232 | |

Bellingham Bay Foundation | 1208 Bay Street | 527-2733 | www.bbayf.org

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| Printed Name | Signature | Address | City | Zip | email |
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Bellingham Bay Foundation | 1208 Bay Street | 527-2733 | www.bbayf.org | info@bbayf.org

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| Printed Name | Signature | Address | City | Zip | email |
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| Printed Name | Signature | Address | City | Zip | email |
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| FRANK M. MORENO | [illegible] | 5595 Guide Meridian | Bellingham | 98226 | |
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| Martin Tennant | Martin Tennant | 417 E. 74th St. | Kansas City MO | 64131 | |
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| Kyle Martin | [illegible] | 3400 Broad St | B'ham, WA | 98229 | |
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| [illegible]en LeSchander | [illegible] | 2211 A St #3 | Blin, WA | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
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| Elsa King | Elsa King | 1407 Iris LN | B'ham | 98229 | |
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| Johnny Grames | John Grames | 1506 E. Maplewood | " | " | Leikos@openaccess.org |

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| Patricia B. Small | Patricia B. Small | 4135 Agate Rd | B'ham | 98226 | |
| ANNE BOTWIN | Anne Botwin | 379 COVE RD. | B'HAM | 98229 | |
| TOM LaPlante | Tom LaPlante | 2400 Ellis | B'ham | 98225 | |
| Jo A. Kimm | Josie Kimm | PO B 3022 | B'ham | 98227 | |
| Joseph Auer | J Auer | 117 Sea Pines Ln | " | " | |
| Eric Robison | Eric Robison | 3954 Byron Ave. #201 Bellingham, WA 98229 | | | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Robert Sloan | Robert Sloan | 4424 Alice St. | Bellingham | 98226 | rasloan@comcast.net |
| Jenna Amberg-Johnson | [illegible] | 1503 J St. | " | 98225 | jennaamberg johnson@gmail.com |
| Sheila Davis | Sheila Davis | 2803 Cowgill | Bham | 98225 | |
| Hill Hudson | Hill Hudson | 1617 Douglas Ave | Bellingham | 98225 | BeatBoxer84@yahoo.com |
| John Primrose | John Primrose | 3485 Redwood Av #6 | Bellingham | 98225 | myfactotum1@yahoo.com |
| Emily Duncanson | Emily Duncanson | 602 Buchanan Towers | Bellingham | 98225 | eduncanson16@hotmail.com |
| Sonja Wingard | Sonja Wingard | 721 Van Wyck Rd | Bellingham | 98226 | wingardle@comcast.net |
| Dale Rothermel | Dale Rothermel | New St. | Bellingham | 98225 | Rotheed@ccwu.edu |
| Dave Patrick | [illegible] | 2507 elm St. B'ham wa 98225 | Bellinghm | 98225 | P_Dave@Lycos.com |
| Sara Dahlstrom | [illegible] | 2851 N. Nugent Rd. Lummi Is, WA 98262 | Lummi Is | 98262 | bulletsandlipstick@hotmail |
| Kayleen Hooley | Kayleen Hooley | 1107 Liberty St | Bellingham | 98225 | hooleyk@cc.wwu.edu |
| Lauren MacMillan | Lauren MacMillan | 1107 Liberty St | Bellingham | 98225 | macmillz@cc.wwu.edu |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Cam Oliver | [illegible] | 521 Whatcom St | B'ham | 98225 | |
| Veronica Gilliam | [illegible] | 1408 Key St | B'ham | 98225 | |
| James Pidgeon | Jim Pidgeon | 1405 E Illinois St. Apt A | B'ham | 98226 | |
| Neil Cook | Neil Cook | 517 32nd St. Apt. 54 | " | 98225 | |
| [illegible] | Jim Lindquist | 3165 E Kelly Rd. | Bellingham | 98226 | drjimmy@tf4.com |
| Beth Williams | Beth Williams | 1915 Roeder Ave #16 | Bellingham | 98225 | |
| Christine Evans | Christine Evans | 1604 Larrabee Ave | " | 98225 | |
| Michael [illegible] | MICHAEL WHITTLEY | 1604 LARRABEE AVE | B'HAM | 98225 | |
| Rebecca Colver | Rebecca Colver | 2144 Birch Cir. | Bham | 98225 | bekahbfree@hotmail.com |
| JOHN Blatter | John Blatter | 1123 RailRoad Ave | Bellingham | 98225 | |
| Karen McMains | Karen McMains | 2400 Donovan Ave #76 | Bham | 98225 | |
| Kathleen Harris | Kathleen Harris | 2619 Huntington Pl. B'ham | B'ham | 98225 | wateressence@earthlink.net |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| GARY PORTER | Gary Porter | 2400 DONOVAN AVE #76 | B'HAM | 98225 | |
| Ben MANN | [illegible] | 1227 NEWTON ST | | 98227 | |
| Chris Walton | [illegible] | 1227 Newton St | | 98229 | |
| Cheryl Coats | [illegible] | 405 Ridgeway Dr | Bellingham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Michael A Hinkel | Michael A Hinkel | 3838 IDAHO ST | Bellingham | 98229 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Kelley Thompson | Kelley Thompson | 1114 21st St | Bellingham | 98225 | thomps52@cc.wwu.edu |
| Karen Sheldon | Karen Sheldon | 2674 Donovan Ave | Bellingham | 98225 | |
| Steve Hansen | Steve Hansen | 2674 Donovan | Bellingham | 98225 | |
| Mary Penttinen King | Mary Penttinen King | 174 14 St | Bham | 98225 | |
| P. Rose | [illegible] | 2815 Kulshan St | " | 98225 | |
| Lance Ekhart | Lance Ekhart | 1659 Birchwood Ave #208 | Bellingham | 98225 | lance[illegible]@hotmail.com |
| Max Timmerman | [illegible] | [illegible] Fairview Ct | Lynden | 98264 | |
| Deborah Westergreen | [illegible] | 8448 N Telegraph | Everson | 98247 | |
| Carl Rosevear | [illegible] | 1015 N. Garden St Bham WA 98225 | B'ham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| DAVID SYRE | David Syre | 4350 Cordata Pkwy | Bellhm | 98226 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Mark Bonsteri | [illegible] | 1601 Broadway | Ble | 98225 | |
| Carrie Potter | Carrie Potter | 1699 Sudden Valley | Bham | 98229 | |
| Michael Potter | Michael Potter | 3006 Vallette St | B'ham | 98225 | |
| Sebastian Scholss | [illegible] | 3006 Vallette St | B'ham | 98228 | |
| Riley Heron | [illegible] | 860 Coho Way #11 | B'HAM | 98225 | |
| MARILYN KRATT | Marilyn Kratt | 2670 Donovan | B'Ham | 98225 | |
| Jeff Kraus | [illegible] | 901 22nd St | B ham | 98225 | |
| Rick Dubrow | Ricky Dubrow | 516 Ridgeway Dr. | B'ham | 98225 | |
| Bob Paltrow | [illegible] | 2501 College St. | Bham | 98225 | |
| Alma Machalski | [illegible] | 1700 S. Nugent Rd | Lummi Is | 98262 | |
| Halley Manion | Halley Manion | 3018 Pinewood Ave. | | 98225 | |
| Hannah Manion | Hannah J. Manion | 3018 Pinewood Ave | B'ham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Dan David | | 516 16 ~~th~~ st. | Bell | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Dudley Evenson | Dudley Evenson | PO Box 4472 | Bellingham | 98227 | |
| David Cowan | David Cowan | 2603 Dakin St. | Bellingham | 98226 | |
| Candace David | Candace David | 516-16th St #2 | Bell. | 98225 | |
| Charles M. Eberdt | [illegible] | 2737 Franklin St. | Bellingham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Cheryl Harrison | Cheryl Harrison | PO BOX 337 | Clear Lake | 98235 | — |
| Larry Williams | Larry Williams | 2719 Donovan | Bellingham | 98225 | |
| Rita Ivey | [illegible] | 901 22 St | Bham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Karin Charrier | [illegible] | 4138 Agate rd | Bellingham | 98226 | KarinJ[illegible]@msn.com |
| Matia Divitt | [illegible] | 4311 Alice st | B'ham | 98226 | Matiad@[illegible] |
| Amanda Thiel-Setterberg | Amanda Thiel-Sett | 901 22nd st | B'ham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Andy Bunn | [signature] | 509 Linden Rd | Bellingham | WA | andy.bunn@gmail.com |
| Kristi Lemm | [signature] | 1305 W. Clearbrook Dr. | B'ham | WA | kristi.Lemm@wwu.edu |
| Kevin Ryan | [signature] | 1065 Chuckanut Dr. | B'ham | WA | |
| Grace Wang | Grace Wang | 237 S. 42nd St. | B'ham | WA | |
| JAMES HELFIELD | [signature] | 2123 H St. | B'ham | WA | |
| Alan Kearney | Alan Kearney | 1541 James St. | B-ham | WA | |
| Ethan Remmel | [signature] | 1309 Easton Ave | B'ham | WA | |
| Shawne Sandes | [signature] | 237 S. 42nd ST | B'ham | WA | |
| Frances Badgett | Frances Badgett | 2514 Wcot St. | Bellingham | WA | frances@[illegible].com |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| June Garnero | June Garnero | 719 Freeston | B-ham | 98225 | |
| Brooke Larrabee | Brooke Larrabee | PO Box 16 | Maple Falls | 98267 | |
| Denise Kittle | Denise Kittle | 4361 Nordum Rd. | Everson WA | 98247 | |
| Ronald L Peterson | Ronald L Peterson | 720 Tanager | B'ham | 98229 | |
| [illegible] | [illegible] | 300 [illegible] | B'ham | 225 | |
| Susan D'Onofrio | Susan D'Onofrio | 4677 Lost Creek Ln | B'ham | 98229 | |
| Cheryl Picolet | Cheryl Picolet | 471 Sudden Valley | B'ham | 98229 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Susan McDermott | Susan McDermott | 3037 W Alpine | B'ham | 98226 | |
| Diana Harrison | Diana J. Harrison | 6063 Medcalf Rd | Bham | 98226 | |
| Kristin McCullough | [illegible] | 829 S. Hills Dr B'ham 98229 | | | |
| Kristen Barber | Kristen Barber | 2306 Henry St | B'ham | 98225 | |
| Anna Keene Winsor | [illegible] | 2320 Park | B'ham | 98225 | |
| Brenda Lowney | [illegible] | PO Box 4217 | B'ham | 98227 | |
| Marija Pagratis | Marija J Pagratis | PMB 135 2950 Newmarket | B'ham | 98226 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Joshua Clements | [signature] | 409 1/2 14th | B'ham | 98225 | JClem_17@yahoo.com |
| Leah Reppart | [signature] | 409 1/2 14th St | B-ham | 98225 | leah5683r@yahoo.com |
| Laura Curtis | [signature] | 2186 E Birch St. | B'ham | 98229 | lauca@fidalgo.net |
| Carol Fuglestad | [signature] | 4613 Willis | B'ham | 98229 | |
| Judy Urquhart | [signature] | 4672 Birch Bay Lynden Rd #47 | Blaine | 98230 | luv2kayak@juno.com |
| Thomas Foster | [signature] | 1546 Sudden Valley | BHAM | 98229 | — |
| Ellen Yang | [signature] | 134 S. 42nd St | B'ham | 98229 | — |
| Robyn Albro | [signature] | 2708 McKenzie Ave | B'ham | 98225 | |
| Roberta Jorgensen | [signature] | 2524 Peabody St. | B'ham | 98225 | dmuga99@yahoo.com |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Michael Larrabee | [illegible] | PO Box 16 | Marblemount | 98267 | |
| Mike Kittleson | Mike [illegible] | 4361 Nordum Rd | Everson | 98247 | |
| Jen Peterson | [illegible] | 1414 E. Maple St. | Bellingham | 98225 | |
| Michael Prolett | Michael [illegible] | 471 Sudden Valley | Bellingham | 98229 | |
| Craig Mayberry | [illegible] | 8744 Northwood Rd | Lynden | 98264 | |
| DAVID Dow | [illegible] | 2932 Seaview Circle | Bellingham | 98225 | |
| Luke W. | Luke [illegible] | 2320 Park St. | B-ham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| D.L Billings | [illegible] | Box 22 | Lynden | 264 | — |
| Jessica Salem | [illegible] | 1716 19th Ave. S. | Seattle | 98144 | jessica8@gmail.com |
| Helen Salem | Helen Salem | PO Box 288 | Sumas | 98295 | |
| Tip Johnson | [illegible] | 2719 Donovan | B'ham | 98225 | |
| Reis Sonthmoth | [illegible] | 2719 Donovan Ave | B ham | 98225 | reishmmi@kurcken.com |
| Kate N Willy | [illegible] | 2902 Cowgill Ave | B'ham | 98225 | |
| Andrew Dessert | [illegible] | 808 21st #360 | B-ham | 98225 | |
| PAT WHEAT | [illegible] | 3421 Noahs Way | B'ham | 98226 | |
| KEITH BOSCH | [illegible] | 1204 NOOKSACK AVE | EVERSON | 98247 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Aimee McDonald | Aimee McDonald | P.O. Box 3 | Custer Wa | 98240 | |
| Ali FOULADI | [illegible] | P.O. Box 667 | HERRIN IL | 62948 | |
| Shirley Ostahos | Shirley Ostahos | 2215 Franklin | B'ham | 98225 | |
| Jeanne Armstrong | Jeanne Armstrong | PO BOX 3112 | B'ham | 98227 | |
| Ivy Wheat | [illegible] | 3421 noahs way | Bham | 98226 | Poisionivy6222@aol.com |
| Lynn Allen | Lyn Allen | 3514 Northwest Ave #5 | Bham | 98225 | lynallen.peace@yahoo.com |
| Karla Rae Ramsey | Karla Rae Ramsey | 1204 Nooksack Ave. | Everson | 98247 | — |
| Denise Vega | Denise Vega | 337 S. Forest St | Bham | 98225 | |
| Jim Kane | Jim Kane | 337 S Forest | Bham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Kellie Lindquist | [illegible] | 1515 Woburn | Bellingham | 98229 | |
| MARGARET MURRAY | Margaret A. Murray | 1421 E VICTOR ST | B'HAM | 98225 | |
| Dean D'Agostino | [illegible] | 1371 [illegible] Rd. | B'ham | 98229 | |
| Lee Potzler | [illegible] | 2017 N Shore Dr | B'ham | 98226 | |
| Kasey Potzler | Kasey Potzler | 2017 Northshore Dr | B'ham | 98226 | |
| Rosemary Noble | Rosemary Noble | 2523 Elm St. | B'ham | 98225 | |
| TINA White | [illegible] | 2308 FRANKLIN St. | B'ham | 98225 | |
| Glen Anderson | [illegible] | 365 Sudden Valley Dr | B'ham | 98229 | |
| LYN SPANGLER | Lyn Spangler | 3215 Vallette St | B'ham | 98225 | |
| LARRY RICHMOND | [illegible] | 3100 ALABAMA | B'HAM | 98229 | |
| Mike Riber | Michael Riber | 2635 Hampton Pl. | B'ham | 98225 | |
| Jennifer Linkhart | Jen Linkhart | 2836 Cottonwood Ave | B'ham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Jake Sullivan | [illegible] | 1505 Humboldt | Bellingham | 98225 | Sulliv25@gmail.com |
| William Sorgen | Will Sor[illegible] | 1209 Roland St | Bellingham | 98229 | |
| Emily Smith | [illegible] | 4014 Byron Ave | Bellingham | 98229 | |
| Mary Goit | Mary Goit | 5010 Samish Wy | B'ham | 98229 | Mrsgoit@comcast.net |
| Mike Thimgan | [illegible] | 2715 Grant st | " | 98225 | |
| Peter Hosm[illegible] | [illegible] | 1309 Postal Dr. | " | " | |
| Jordan Rain | Jordan Rain | [redacted] | Bellingham | 98225 | |
| Matthew Beek | [illegible] | 2102 Dayton Ct Renton → | | 98055 | [illegible] |
| Austin "gay" | Bird "Homo" | 2020 Cherry st No5 | [illegible] | 98260 | [illegible] |
| Brian Hakim | [illegible] | 2306 Douglas Rd #302 | Ferndale | 98248 | gigadrack60@yahoo.com - myspace.com ~~[illegible]@yahoo.com~~ |
| John Pitsch | John Pitsch | 4571 Decatur Dr. | Ferndale | 98248 | |
| Chris Hammond | [illegible] | 2306 Douglas Rd #302 | Ferndale | 98248 | Southparkeyoopunks@yahoo.com |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Alex McK-7 | [illegible] | 2623 James St | Bham | 98225 | |
| Barbara Gilday | Barbara Gilday | 2300 I St. | B.ham | 98225 | |
| Jenna Moog | Jenna Moog | 939 20th St. | B'ham | 98225 | |
| Clover Martin | [illegible] | 6992 Goodwin Rd | Everson | 98247 | cmartin331@hotmail.com |
| Keena Mullen | Keena Mullen | 3265 Camp 2 Rd | Sedro Woolley | 98284 | kmullen@wsu.edu |
| Allison Sayre | Allison Sayre | 2901 Bill McDonald Pkwy #613 | B-ham | 98225 | |
| Fred Brighton | Fred Brighton | 108 Crestline Dr. | B'ham | 98229 | |
| Laura Lamositele | Laura Lamositele | 1824 B 16th St. | Bham | 98225 | saygoodbyetosunshine@hotmail.com |
| Deirdre Kettlestrings | [illegible] | 3813 Hatley Rd | EVERSON | 98247 | |
| Jason Kettlestrings | [illegible] | 3813 HATLEY RD | EVERSON | 98247 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Maureen Saunders | Maureen Saunders | 1455 Iron St. | Bellingham | 98225 | |
| Cheri Johnson | Cheri R Johnson | 1212 E Maplewood Ave | Bham | 98225 | |
| Sheila Morgan | Sheila Morgan | 1701 Cowgill Ave #A | Bellingham | 98225 | |
| Brian Montana | [illegible] | 905 N.E 7th St Coupeville | Coupeville | 98239 | |
| Andrew S. McBride | ASMcBride | 3615 Orange Blossom Ct | Bellingham | 98226 | |
| Julia Milburn | [illegible] | 114 Bayside Place | Bellingham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Sibyl Sanford | Sibyl Sanford | 341 S. Garden | B'ham | 98225 | ssanford10@comcast.net |
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| rinted Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Rex Weyler | [illegible] | 4293 W 10th Ave | Vancouver | | weyler@telus.net |
| [illegible] | [illegible] | 147 [illegible] LN | BELLINGHAM | | [illegible] |
| John [illegible] | [illegible] | 2320 - I St #6 Bellingham WA | Bellingham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| John Servais | [signature] | 1609 Mill Ave | Bellingham | 98225 | john@nwcitizen.com |
| Jim Allaway | [signature] | 2813 Summer St. | B'ham | 98225 | |
| Ann Yow-Dyson | [signature] | 700 13th St. | Bellingham | 98225 | aeeyow@earthlink.net |
| Thomas Gotchy | [signature] | 2911 Ellis St. | Bellingham | 98225 | tellytom@msn.com |
| Laura Jimerson | [signature] | 1526 Lowe Ave | Bellingham | 98229 | laurajimerson@yahoo.com |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Cecilia Stevens | Cecilia Stevens | 1908 18th St. C-101 | B'ham | 98225 | |
| G Dawn Hanson | [illegible] | 930 Indian St #2 | B'ham | 98225 | |
| [illegible] | Colleen MacGilchrist | 414 Boulevard #201 | B'ham | 98225 | |
| Bob McGilchrist | [illegible] | 414 Blvd #201 | " | " | |
| Kirby White | [illegible] | 2308 Franklin St | " | 98225 | |
| Harry Powell | [illegible] | 1660 E Bakerview Rd | B'ham | 98226 | |
| Kathy Powell | K Powell | 2516 Kulshan St | Bham | 98225 | |
| Shelly Stark | Shelly Stark | 1105 Raymond St | Bham WA | 98229 | |
| JANICE OSOSKE | Janice Ososke | P.O. BOX 1177 | Ferndale | 98248 | |
| Christine Theresa | [illegible] | 3302 37th Pl S. Seattle WA | Seattle | 98144 | |
| John Titherness | [illegible] | 2014 E. Aloha St. Seattle WA 98112 | Seattle | 98112 | |
| Sierra Morgan | [illegible] | 9933 Navarth St SW Seattle Wa | Seattle | 98162 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Joshua Hill | [illegible] | 1420 St Paul St. | Bellingham WA 98225. | 98225 | yoshi420247@ |
| Greg Miller | [illegible] | 2227 Valencia | Bellingham WA | 98225 | gmiller@nwcomputers |
| Vic Zurbano | [illegible] | — | Bellingham | 98225 | — |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| PATRICK BEEBE | [illegible] | 7 WINTERCRESS WAY | BELLINGHAM | 98229 | patrickbeebe@gmail.com |
| Joanne Praetzel | [illegible] | 3117 Sunset Way | B'ham | 98226 | - |
| Mary Rawlins | [illegible] | 2356 Ellen Rd | Bham | 98226 | |
| Sean Quinn | [illegible] | 2013 texas St | Bellingham | 98229 | — |
| Ben Rupert | [illegible] | 2807 James St | B ham | 98225 | |
| Linda Moore | [illegible] | 720 Van Dyk | Lynden | 98264 | |
| PRENTISS COLE | [illegible] | 10231 15th St | | | |
| Ken Wilcox | [illegible] | 5900 Fraser St | B'ham | 98229 | |
| Christy Osthimer | [illegible] | 2512 King St | Bham | 98225 | |
| Debby Meyers | [illegible] | 1616 Knox Ave | B'ham | 982[illegible] | |
| Emma Watson | [illegible] | 2183 Maureen Dr | Ferndale | 98248 | writemydreams@hotmail |
| Chuck Schell | [illegible] | 1601 Calloway Dr. | Bham | 98229 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Chyrn Gruber | [illegible] | 630 High st #202 | B-ham | 98225 | |
| Jerry Braunfeld | [illegible] | 3820 Fielding | Bham | 98225 | |
| Casey Pape | [illegible] | 133 S 41st | Bellingham | 98229 | |
| Meredith Murray | Meredith Murray | 858 E. Douglas | Bell. | 98229 | |
| M.C. Chadwell | M.C. Chadwell | | Seattle | 98121 | |
| Deborah Kithouse | [illegible] | 2028 Huron St. | B'HAM | 98229 | |
| Kyle Teeter | [illegible] | 2700 Orleans | Bellingham | 98226 | |
| Alex Garcia | Alex Garcia | 1613 Brookview Pl | B'ham | 98226 | |
| Chris Jacobs | [illegible] | 610 Clark Rd | B'ham | 98225 | |
| Kathleen Ing | Kathleen ING | 3100 St. Clair St. | B'ham | 98226 | |
| ~~Kathleen Ing~~ Gabe Fanber | [illegible] | same | | | |
| Constance LaBine | Constance LaBine | 713 Vine | Lynden | 98264 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Derrick Michelson | Derrick Michelson | 504 Tremont Ave Apt 105 ~~Bellingham~~ | Bellingham | 98226 | |
| Jennifer Monson | Jennifer Monson | 5349 Bellaire Drive | Bham | 98226 | |
| ALAN BRIGGS | Alan Briggs | 2916 ALVARADO DR | Bellingham | 98229 | |
| PETE SAUDEY | [illegible] | 4295 ALDRICH RD. | Bellingham | 98226 | |
| Jordan Lawson | John Jones | PO BOX 103 | CUSTER | 98240 | |
| David M Lawson | David M Lawson | PO B103 | Custer | 98240 | |
| Kimber Langston | K Langston | 716 Cedar Creek Ln | B'ham | 98229 | |
| Brad Reynolds | [illegible] | 1129 Lenora Ct | B'ham | 98225 | |
| Ernie Loreen | Ernie Loreen | 260 Tyee Dr | Pt Roberts | 98281 | |
| Paul George | [illegible] | PO BOX 5439 | B'HAM | 227 | |
| Marshall Petry | [illegible] | 405 Ridgeway Dr. | B'ham | 98225 | |
| Anita C. Hannon | Anita C. Hannon | 2807 James St. | B'ham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Nancy Haley | NHaley | 1828 Seacrest Dr | Lummi Is | 98262 | |
| Christina Tawes | Christina Tawes | 3009 Tulip Rd | B'ham | 98225 | |
| Harbeen Gill | [illegible] | 1015 Lone Tree Ct | B'ham | 98229 | |
| Catherine Dayhoff | C Dayhoff | 2466 McKenzie Ave | Bham | 98225 | |
| ISAAC STAVAS | Isaac Stav | 211 MAPLE PARK DR SE | OLYMPIA | 98501 | |
| DAVID A. CZUB | David A. Czub | 2726 Vallette St. B'ham Wa 98225 | B'ham | 98225 | |
| Betty Nelson | Betty Nelson | 3911 Northridge Way Bham 98226 | Bham | 98226 | |
| Terri Blake | T. Blake | 2684 Aldergrove Rd Ter | Ferndale | 98248 | |
| Monique Arsenault | MArsenault | 1707 F street | B'ham | 98225 | |
| BURKE HOUDE | Burke Houde | 1318 BONANZA WAY | BHAM | 98229 | |
| Linda Johnson | Linda J | 25592 Loonie Pl Mt Vernon, | Mt Vernon | 98274 | |
| Alison Herbrandson | AliHerbrandson | 1410 E. Illinois St, | B'ham | 98226 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Vanessa Laurky | [illegible] | 830 Hight St #202 | B'ham | 98225 | vloucky@yahoo.com |
| Beth Brownfield | Beth Brinfield | 3820 Fielding Ave | Bh | 98229 | |
| Andrea Fisker | [illegible] | 9737 Vista Terrace | Blaine | 98230 | |
| Emily Copper | [illegible] | 2533 Victor St | B'ham | 98225 | |
| Lorena Wiserman | [illegible] | PO Box 4369 | B'ham | 98227 | |
| Mandee Manes | Mandee Manes | 1103 15th E | Bham | 98222 | |
| Rachel Garcia | [illegible] | 1613 Brookview Pl | Bham | 98226 | |
| [illegible] | [illegible] | 1706 I ST | B'ham | 98225 | |
| Margaret Kim | Margaret Kim | 2148 Oat St | Lynden | 98264 | |
| Joe Grennno | [illegible] | 719 Fielding | Bham | 98225 | |
| Coleman Fog | | | | | |
| Curt Verstegen | C. Verstegen | 2212 C St B-Ham | | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Elizabeth Standen | Elizabeth Standen | 7112 Rainier Way | Glacier | 98244 | |
| JEROMY STANDEN | Jeromy Standen | 7112 RAINIER WY | GLACIER | 98244 | |
| Natasha Green | Natasha Green | 3211 Meridian | Bellingham | 98225 | |
| Nicole Curry | Nicole Curry | 2523 Jaeger St | Bellingham | 98225 | |
| Karen Cornelius | Karen Cornelius | 1305 ~~[illegible]~~ W. Clearbrook Dr #5 | Bellingham | 98229 | |
| Ellen Clark | Ellen Clark | 2627 W Crestline Dr | B'ham | 98226 | |
| Sheri Smith | S Smith | 302 Ten Mile Rd. | ~~Bell~~ Lyn | 98264 | |
| CATHERINE BERGER | CRBerger | 411 E. Front St. | Lynden | 98264 | dancingmaiden@hotmail.com |
| Ian Stewart | [illegible] | 1901 H St. | Bellingham | 98225 | istewart@transformllc.org |
| [illegible] | [illegible] | 2320 E Street | " | " | |
| Aaron O'Brien | [illegible] | 22007 Little Mtn Rd | Mt Vernon | 98274 | |
| Rachael Bates | Rachael Bates | 1110 D[illegible] | B'ham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Cameron McRorie | CAMcRorie | 2500 Samish Way #47 | Bellingham | 98229 | |
| JASON MANTELLO | [illegible] | 3044 TULIP RD | BHAM | 98225 | |
| Nikki Schormann | Nikki Schormann | 217 ½ N. Holly St #7 | Bellingham | 98225 | |
| Jake MONSON | Jake Monson | 5349 Bellaire DR | B'HAM | 98226 | |
| Sara Morris | Sara Morris | 1240 Undine St | " | 98229 | |
| Ingor Briggs | Ingor S Briggs | 2916 Alvarado Dr | B'ham | 98229 | |
| ANDREA LAWSON | Andrea Lawson | 1010 N. GARDEN ST. APT 2 | BELLINGHAM | 98225 | lawsona4@ cc.wwu.edu |
| Valerie Loveau | Valerie Loveau | 1985 Province Rd. | Point Roberts | 98281 | |
| Teresa Rohwer | Teresa Rohwer | 4341 Garding | B'ham | 98226 | |
| Matthew Petrini | [illegible] | 405 Ridgeway Dr. | Bellingham | 98225 | |
| TERRADAN GREENWOOD | [illegible] | P.O. 2766 9 | Ferndale | 98248 | |
| Norah Yates | Norah Yates | 28409 SE ISSAQUAH FALL CITY RD | FALL CITY | 98024 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Shianne Poor | Shianne Poor | P.O. Box 4301 | Nooksack | 98276 | my-misslovely@yahoo.com |
| David Block | David Block | 9915 Mountwood Rd | Blaine | 98230 | — |
| Peter Gorman | [illegible] | 128 Viewhill | B'ham | 98225 | |
| Carole Lince | Carole Lince | 2018 Huron St | Bellingham | 98226 | |
| JERRY SCHUSTER | Jerry B Schuster | 2427 GOSHEN RD | B'HAM | 98226 | |
| Peter Longwood | [illegible] | 570 Heron Point Lane | B'ham | 98229 | |
| Eivind Clausen | [illegible] | 2518 Erie St. | B'ham | 98226 | |
| Jessica Heldemann | [illegible] | 4195 Ruby Pl | B'ham | 98226 | |
| Brandon Longwell | [illegible] | 4195 Ruby P | B'ham | 98226 | |
| Robert L Simmons | Robert L Simmons | 934 Highland Dr | B'ham | 98225 | |
| Caryn Simmons | Caryn [illegible] | 2700 Kulshan | " | " | |
| Beth Ager | Beth Ager | 4285 [illegible] | 98226 | | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Marshall W. Erickson | [illegible] | PO Box 280 | Everson | 98247 | |
| Darren Shields | [illegible] | PO Box 77 | Haines | 99827 | |
| Justin Hartle | [illegible] | 3115 Racine #202 | Bham | 98225 | |
| Cynthia Franzen | Cynthia Franzen | 353 Viewcrest Rd | Bham | 98229 | |
| Carolyn Gordon | [illegible] | 1202 Kenoyer Dr | B'ham | 98229 | |
| Verna Bennett | Verna Bennett | 2724 Williams St. | Blgm | 98226 | |
| Darlene Simmons | Darlene Simmons | 934 Highland Dr. | B'ham | 98225 | |
| Chris Ager | [illegible] | 5512 15th Ave NE | Seattle | 98105 | |
| Najib Boulos | [illegible] | 1716 19th Ave South Seattle WA | Seattle | 98144 | |
| Barb Timmer | Barbara K Timmer | 5365 Salish Rd | Blaine | 98230 | |
| Lori Salem | [illegible] | P.O Box #288 | Sumas | 98295 | |
| Wendy Johnson | [illegible] | 2400 Madrona St | Bellingham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| JOHN HAYES | [illegible] | 16215 NE 112TH CT | REDMOND | 98052 | purple53hayes@yahoo.com |
| Thomas Opryszek | Thomas Opryszek | 3745 W hills Pl | Bellingham | 98226 | opry7811@uidaho.edu |
| Adam Opryszek | adam Opryszek | 3745 W hills Pl | Bellingham | 98226 | opryszek@fidalgo.net |
| Hideko Todoroki | Hideko Todoroki | 283 W. LK Samish Dr | Bellingham | 98229 | detch1005@yahoo.com |
| Liz Wright | E Wright | 280 Chuckanut Pt Rd | B'ham | 98229 | lizthom98226@yahoo.com |
| [illegible] | DIANE FIRESTONE | 4303 Kingsway | Anacortes | 98221 | |
| Steven Gadingan | [illegible] | 1014 N. Garden | Bellingham | 98225 | |
| Joyce Busch | Joyce Busch | 424 14th St #201 | Bellingham | 98225 | |
| Tammy McBride | T McBride | 740 Mason | B'ham | 98225 | |
| Erik Cooledge | [illegible] | 2611 Dewida | B'ham | 98226 | |
| Laura Malone | [illegible] | 1050 Carolina Ave | B'ham | 98225 | |
| Rebekah Snodgrass | Rebekah Snodgrass | 3210 Firwood Ave | B'ham | 98225 | rsnodgrasshome@yahoo |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| DAR REA | [signature] | PO BOX 2037 | B'HAM | 98227 | |
| Kathy Tomas | [signature] | 609 Donovan | B'ham | 98226 | |
| DEBORAH DEMPSEY | [signature] | 1123 14TH ST | B'ham | 98225 | |
| David Doody | [signature] | 2423 Lakeway Dr. | Bellingham | 98229 | |
| Blair August | [signature] | | B'ham | 98225 | |
| DANE MACDONALD | [signature] | 416 N FOREST | B'ham | 98225 | |
| Duane Jager | [signature] | 2401 E St | " | " | |
| Christine Gibbs | [signature] | 2401 E St. | " | " | |
| Kaitlin Corcoran | [signature] | 6069 Hatton Ferndale 98248 | | | |
| Kevin misinda | [signature] | 1017 Jersey St | B'ham | 98225 | |
| Jennifer Dolese | [signature] | 521 Donovan Ave | B'ham | 98225 | |
| Thomas Dones | [signature] | 521 Donovan Ave | " | " | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Kathryn McAllister | [signature] | 1520 McKenzie Ave | Bellingham | 98225 | Kathrynmcallister@att.net |
| Chris D'Onofrio | [signature] | 1517 Sudden Valley | Bellingham | 98229 | N/A |
| Max Vanderwyst | [signature] | 1517 Sudden Valley | Bellingham | 98229 | N/A |
| Ross Whetstone | [signature] | 4580 Lk Terrell Rd | Ferndale | 98248 | Rawwdogg@Gmail.Com |
| Nickolas A. Spain | [signature] | 110 E-chestnut APPT 305 | Bellingham | 98225 | spainnc@Gmain.com |
| Tony McNeil | [signature] | 4298 Frances Ave | B'ham | 98226 | N/A |
| Kreg Schlosser | [signature] | 3423 Northwest Ave | B'HAM | 98225 | N/A |
| Mike Brenaman | [signature] | 643 W. Horton Way #132 | Bham | 98226 | mikeb2399@msn.com |
| George Drake | [signature] | 2900 Dakin St. | Bellingham | 98226 | gdrake@nas.com |
| Steve Willianson | [signature] | 1113 E. Clearbrook Dr | Bellingham | 98229 | N/A |
| Rick Kennedy | [signature] | 1204 Yew St. | Bellingham | 98229 | electronavalanche@gmail.com |
| John D'Onofrio | [signature] | 4677 Lost Creek Lane | B'ham | 98229 | - |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Robin Reynolds | R Reynolds | 754 Chuckanut | B ham | 98229 | |
| Jeremy Brown | [illegible] | 3217 Greenwood | [illegible] | 98225 | |
| Pat Banasky | Patricia Banasky | 619 Canyon View Drive | B'ham | 98225 | |
| [illegible] | [illegible] | 2211 [illegible] St #3 | B Ham | 98225 | |
| Nick Spaeth | [illegible] | 1407 Halleck St | Bham | 98225 | |
| Jason Styles | [illegible] | 1708 E Kellogg Rd | Bham | 98226 | |
| Jennifer Randall | Jennifer Randall | 1100 East Union 1B Seatt | Seattle | 98122 | |
| Courtney Caldwell | [illegible] | 916 Jersey | B'ham | 98225 | |
| Linda Capriotti | Linda Capriotti | 1444 S. State St #3 | B ham | 98225 | |
| Tyson miller | Tyson miller | 1313 23rd street | B ham | 98225 | |
| MARY T. BREUNING | Mary T. Breuning | 1904 18th St B 106 | B'ham | 98225 | |
| Rayne Miller | [illegible] | 11905 325th Ave NE | Duvall | 98019 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| ORION LINDSOPR | Orion Lindl | 2584 Finkbonner Rd | B'HAM | 98226 | |
| Steve Hansen | Steve Hansen | 2674 Donovan | Bellingham | 98225 | |
| Kevin Terpstra | [illegible] | 2903 St. Paul 98226 | B'ham | 98226 | |
| Kevin Wehman | Kevin Wehman | 1960 26th Ave E | Seattle | 98112 | |
| Margaret B Mench | MB Mench | 4915 Samish Way #11 | B'ham | 98229 | |
| K Laquell | K Laquell | 233 Thau Seaford | SW | 98284 | |
| Chris Clm | [illegible] | 1366 Walton Ferndale Ct | Ferndale | 98248 | |
| Ken Lennon | Ken Lennon | 3623 Dance St | Bham | 98225 | |
| MAURA LEVEROOS | Maura L | 1611 MOORE St | BHAM | 98229 | |
| Joyce Prigot | JOYCE PRIGOT | 4145 Ridgewood Ave | B'ham | 98229 | |
| Lana Ford | Lana Ford | 1924 18th G 204 | B'ham | 98225 | |
| J. A HOLGATE | J. A. Holgate | 3433 [illegible] | " | 98227 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Elizabeth Chambers | Elizabeth Chambers | PO Box 3007 | B'ham | 98225 | |
| MEGAN MOORE | [illegible] | 701 Willow | B'ham | 98225 | |
| Emy Tecin | [illegible] | 2700 Orleans | Bham | 98226 | |
| James Spaich | James A. Spaich | 1209 15th St. | B'ham | 98225 | |
| Mary K. Witter | Mary K Witter | 4915 Samish Way #26 | B'ham | 98229 | |
| Tara Sanford | [illegible] | 1802 Electric Ave | Bham | 98229 | |
| Tracey Clarke | [illegible] | 160 W Murdock B-103 | Sedro Woolley | 98284 | |
| Andy McBride | ASM Bride | 3615 Orange Blossom Ct | B'ham | 98226 | |
| NORENE KIMES | Norene Kimes | 2407 Princeton Ct | B'Ham | " | |
| SHANNON McGuire | [illegible] | 605 14th ST. | B'Ham | 98225 | |
| Allan Richardson | Allan Richardson | 2935 Martin St. | Bellingham | 98226 | |
| Jane Blume | Jane E Blume | 2622 Williams St | B'ham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Alison Blume | Ali Blu | 2622 Williams St | Bellingham | 98225 | alison.blume@gmail.com |
| Nancy Pitsch | Nancy Pitsch | 4571 Decatur | Ferndale | 98248 | nancypitsch@hotmail.com |
| Helen O'Neill | [illegible] | 1231 [illegible] St. | B'ham | 98229 | |
| Jesse Wheeler | [illegible] | same ↑ | | | |
| Rebecca McDow | R McDow | PO Box 282 | Bellingham | 98224 | rebecca jorgn@hotmail |
| Nathan Singh | [illegible] | 1234 Grant St Apt B | Bellingham | 98225 | |
| Evan Johnson | [illegible] | 1229 WILSON AVE | " | " | |
| Del Lowery | D Lowery | PO Box 4217 | B'ham | 98227 | |
| Robert D. Riesenberg | [illegible] | 1366 Wellington Rd | B'ham | 98226 | |
| Judith Foster | J Foster. | 1546 Sudden Valley | B'ham | 98229. | |
| GaZhong Yuen | [illegible] | 3511 Chuckanut Ave | B'ham | 98229 | |
| Katriana Jorgensen | Katriana Jorgensen | 2524 Peabody St | B'ham | 98225 | |

Bellingham Bay Foundation | 1208 Bay Street | 527-2733 | www.bbayf.org | info@bbayf.org

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Corina Matson | Corina Matson | 2211 Donovan | Bellingham | WA | |
| Cynthia Sheldon | Cynthia Sheldon | 141-D E Laurel Rd | " | 98226 | |
| Chris Wren | Chris Wren | 2311 Elm St. | B'ham | 98225 | |
| Lee Posthumus | [illegible] | 2716 Vallette St. | B'ham | 98225 | |
| MIKE PRAETZEL | Mike Praetzel | 3117 Sunset Way | " | 98226 | |
| Alex Miller | [illegible] | PO Box 301 98227 | B'ham | 98227 | |
| PAULA OGDEN MUSE | [illegible] | PO Box 233 98267 | Rockport | 98267 | |
| Connie McCloud | Connie McCloud | PO 543 | Concrete | 98237 | |
| Jo Baner | [illegible] | 3143 D'Lund St | Bellingham | 98226 | |
| Susan Wamsley | Susan Wamsley | 2403 James #301 | Bham | 98225 | |
| [illegible] | [illegible] | [illegible] Van Dyk | Lynden | 98264 | |
| Scott Blume | Scott Blume | 2622 Williams St. | Bellingham | 98225 | |

# Cleanup, Not Cover up!

The current preferred alternatives for the Whatcom Waterway cleanup leave too much mercury in the waterway. This is not acceptable. We want the Department of Ecology to require the *removal* of mercury from the waterway as opposed to capping in place.

| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Dustin Stonecipher | [signature] | 3111 Ferry Ave B310 | B'ham | 98225 | zildjian114@hotmail.co |
| Scott Dewees | [signature] | 2310 D St | B'ham | 98225 | [illegible]@gmail.com |
| [illegible] Dinsmore | [signature] | 2316 Cornwall | Bell | 98225 | N/A |
| [illegible] | [signature] | 919 E. McLeod Rd | B'ham | 98226 | N/A |
| Peter Hedel | [signature] | 420 N. Post St. | Ferndale | | |
| Darlene R Bauman | [signature] | 2239 Woburn St #21 | Bellingham | 98229 | drabauman@hotmail |
| Jamie Falter | [signature] | 3111 Ferry Ave B310 | B'ham | 98225 | Jfalter@linknet.com |
| Charlie Noard | [signature] | 1812 Laurel Ave | Bellingham | 98225 | psyfi84@aol.com |
| Sean Vazquez | [signature] | 1312 Laurel Ave | Bellingham | 98225 | sv@wow.net. |
| Erik Reihl | [signature] | 1812 Laurel Ave | B'ham | 98225 | [illegible]@gmail.com |
| Mike Olehan | [signature] | 3912 Forest | [illegible] | 98229 | |
| Darren Pobien | [signature] | 5585 [illegible] | Bellingham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Josh Vasilinda | [illegible] | 4364 Guide Meridian | Bellingham | 98226 | |
| Hrefna Sif Gunnarsdottir | [illegible] | 1320 23rd Bham | | | |
| Cathy Riber | Cathy Riber | 2635 Hampton Pl | Bellingham | 98226 | |
| TOM FARNELL | Thomas W Farnell | 1202 39TH ST | BE'HAM | 98226 | |
| Michael Short | Mi Short | 2308 I St | B'ham | 98226 | |
| Laurie A Rotecki | LAURIE ROTECKI | 2308 I St | B'ham | 98226 | |
| Meredith Murray | Meredith Murray | 858 E. Douglas | B'ham | 98229 | |
| Nick Nicolodis | [illegible] | 1004 Highland Dr. | B'ham | 98229 | |
| James Loucky | [illegible] | 1218 Woburn St | B'ham | 98229 | |
| Mark Lorenz | [illegible] | 818 Indian Terrace | B'ham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Reanne Bowlby | Reanne Bowlby | | Bellingham | 98225 | |
| Andrea Yee | Andrea Yee | | Bellingham | 98225 | |
| Tyler Thornton | [illegible] | | Bellingham | 98225 | |
| Rina Zourkos | Rina Zourkos | | Bellingham | 98225 | |
| Amber Favro | Amber Favro | | Bellingham | 98226 | |
| Eleni Zourkos | Eleni Zourkos | | Bellingham | 98225 | |
| Alex Roemmele | Alex Roemmele | | Bellingham | 98225 | |
| Linda Telfer | LTelfer | | Bellingham | 98229 | |
| Ross Gidlow | [illegible] | | Bellingham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Robin Robertson | Robin Robertson | | Bellingham | 98225 | |
| Doug Robertson | [illegible] | | Bellingham | 98225 | |
| Cassie Jarvis | Cassie Jarvis | | Bellingham | 98226 | |
| Topher Rees | [illegible] | | Bellingham | 98225 | |
| DAVID C PEARCE | David C Pearce | | Anacortes | 98221 | |
| Angie Drake | A. Drake | | Arlington | 98223 | |
| Jethro James | [illegible] | | Greier | 98241 | |
| Bob Meloy | Bond | P.O. BOX 572 | B'ham | 98227 | |
| GARY OAKSFORD | Gary Oaksford | | | | |
| Kim Brandt | Kim Brandt | 2541 Ellemain RD | Bellingham | 98226 | |
| Lydia Devine | L Devine | | Bellingham | 98225 | |
| Hannah Martin | Hannah Martin | | Bellingham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Rebecca | Rebecca | 5552 70th | B'ham | 98229 | rebecca@yah. |
| Danielle Brawner | D Brawner | 1320 [illegible] dr. #752 | Bham | 98229 | |
| Sean Cain | [illegible] | 2725 Colby Ave | Everett | 98201 | [illegible] |
| M B[illegible] | Mike Beckman | 7333 Huisman Pl | Lynden | 98264 | |
| Meredith Ramilo | Meredith Ramilo | 1132 Fairhaven Complex W. Wash University | B'ham | 98225 | meredith.ramilo@gmail.com |
| Anthony Greenheck | [illegible] | 2124 163 SE 34th st Bellevue WA. | Bellevue | 98006 | anthony@yahoo.com |
| Kody Bosch | Kody Bosch | 401 West Champion st. Apt. 303 | B'ham | 98226 | N/A |
| Johnna Langen | Johnna Langen | 2201 C St. Apt 6 B'ham Wa. | B'ham | 98225 | N/A |
| Kah Slater | Kah Slater | 06 Morey ave. | B'ham | 98225 | N/A |
| Steve Bolster | [illegible] | 322 N State st | Bellingham | 98225 | N/A |
| Brent C. | [illegible] | | B'HAM | 98229 | |
| Orion Lackey | Orion Lackey | 121 Alder Dr | Sedro Woolley | 98284 | Orion@[illegible].com |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Sonee Hayes | [illegible] | 5821 Ronnie Hill Ln | Ferndale | 98248 | |
| Chloe Fisher | Chloe Fisher | | Bellingham | | |
| Madelyn Read | Madelyn Read | | Bellingham | 98225 | |
| Carly Garhaas | Carly Garhaas | | Bellingham | 98229 | |
| Josh Grantham | Josh Grantham | | Bellingham | | |
| Erin Brattien | Erin Brattien | | Bellingham | 98225 | |
| Brendan W. | [illegible] | | Bellingham | 98229 | |
| Andrew [illegible] | ANDREW | | | | |
| Josephine Vorenkamp | Josephine Vorenkamp | | Bellingham | 98226 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| MARGARET MACKENZIE | Margaret MacKenzie | 2626 PARK ST | BELLINGHAM | 98225 | mwartistic1@yahoo.com |
| REBECCA FERGUSON | Rebecca Ferguson | 278 E. BAKERVIEW RD #121 | BELLINGHAM | 98226 | fergusonrebecca@msn.com |
| Raelene Winter | Raelene Winter | 1628 Firmeadow Ct | Ferndale WA | 98248 | wintersmagic@Gmail |
| Liz Crocker | Liz Crocker | 5361 [illegible] | B'ham | 98226 | — |
| Lisa Arndt | Lisa Arndt | 1024 W. Bakerview A | Bham | 98226 | — |
| Marilyn McLean | M. McLean | 2137 Walnut | Bham | 98225 | |
| Melanie Josson | [illegible] | | Ferndale | 98248 | |
| Lynn Bennett | L.W. Bennett | 2115 Ellis St | B'ham | 98225 | |
| Jack Smith | Jack W. Smith | 2100 Electric Ave Apt 329 | B'HAM | 98229 | |
| Jeremy Scully | Jeremy Scully | 2100 A St. #1 Bellingham, WA | B'ham | 98225 | — |
| Elizabeth Redpath | E. Redpath | 3025 meridian | Bham | 98225 | |
| Pete Redpath | Pete Redpath | 3025 MERIDIAN | B'ham | 98225 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Lucy | Lucy | 1545 Marine Dr. | Bellingham WA. | 98225 | Do not have one |
| Max Evans | [illegible] | 1545 Marine Dr. | Bellingham WA. | 98225 | [illegible]@hotmail.com |
| Emma Ayubi | Emma Ayubi | 1489 Marine Dr. | Bellingham WA | 98225 | eayubi@comcast.net |
| Taylor Ayubi | Taylor Ayubi | 1489 Marine Dr. | Bellingham Wa | 98225 | Bmx bikerpro@comcast.net |
| Sheri Ayubi | Sheri Ayubi | 1489 Marine Dr. | B'ham | 98225 | Sayubi@comcast.net |
| Carl Ayubi | [illegible] | 1489 Marine Drive | B'ham | 98225 | CAYUBI@HNTB.COM |
| Carol Durham | Carol Durham | 2520 Peabody St. | Bellingham | 98225 | carolmdurham@hotmail.com |
| Sasha Jorgensen-Muga | Sasha Jorgensen-Muga | 2524 Peabody St. | Bellingham | 98225 | sjorgensenmuga@macalester.edu |
| Robert Stan Parker | [illegible] | 2520 Jefferson St. | " | " | |
| David Muga | [illegible] | 2524 Peabody st | Bellingham | 98225 | dmuga@surepost.net |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Leslie Payne | Leslie Payne | 1601 I St. Bellingham, WA 98225 | | | |
| Jeremiah Schwartz | Jeremiah Schwartz | 1704 Monroe Bellingham 98225 | | | |
| Kiki Cardarelli | Kiki Cardarelli | 2275. Forest St. 98225 | | | |
| Darin Ngar | [illegible] | | Bellingham | | |
| Jon Stordahl | [illegible] | PO Box 2248 Bellingham WA | | 98227 | |
| Isaac Howard | Isaac Howard | 1443 Sweetbay Dr. 98225. | Bellingham | 98225 | |
| Eric Welsch | Eric Welsch | PO 2003 | Deming | 98244 | |
| Karryn Dean | Karryn Dean | 2628 Patton 98225 | Bellingham | 98225 | |
| Val Park | V Park | POB 4032 Bell 982 | Bell | 98227 | |
| Pat Baker | Patrick J Baker | 1124 E Beachview Pl Bellingham WA 98226 | Bell | 98226 | |
| Darmon Sweeney | Damon Sweeney | POB 4150 Bham 98227 | | | |
| Benjamin Penic | [illegible] | 1326 23rd bham 98225 WA | | | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Joseph Deeny | Joseph B. Deeny | 2104 Wilson Ave | Bhm | 98225 | |
| Anna Deeny | [illegible] | ✓ | ✓ | ✓ | |
| Mark Ashworth | [illegible] | 614 12th | Bham | 98225 | |
| Nancy Taylor | Nancy Taylor | 1100 - 21 | B'ham | B-5 | |
| Dorothy Dale | DOROTHY DALE | 741 Chuckanut Dr. | B'ham | 98229 | |
| ALFRED DALE | Alfred S. Dale | " | " | " | |
| Patty McIntyre | Pat McIntyre | 1269 Sudden Valley | Bham | 98226 | |
| Kathleen Rogers | [illegible] | | B'ham | 98225 | |
| Craig Dunstan-McGrail | Craig Dunstan-McGrail | 2727 Lafayette St | B'ham | 98225 | |
| [illegible] Dunstan-McGrail | [illegible] | " " " | " | " | |
| Chris Veseth | Chris Veseth | 1400 Broad St | B'ham | 98229 | |
| Amy Shavelson | [illegible] | 2315 Verona St #C | " " | 98229 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| J Lilligren | J Lilligren | [illegible] | Bellingham | | |
| STEVE HOLSTS | Steve Holsts | | " | | |
| ERIN LIBBY | [illegible] | | B'ham WA | | |
| Amnyn Masci | Amyn Masci | | Bellingham WA | | |
| RACHEL LEE | [illegible] | | B'Ham | | |
| Ted Clifton | [illegible] | | Bellingham | | |
| Kristen Ingman | Kristen Ingman | | Bellingham | | |
| Anne Thompson | Anne Thompson | | B'ham | | |
| Chris Thompson | [illegible] | | B'ham | | |
| Marjorie Scarlett | Marjorie Scarlett | | Bellingham | | |
| James Milstead | James Milstead | | Bellingham | | |
| Anna Ryan | Anna Ryan | | Bellingham | | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Pat Kirsch | [illegible] | 13010 NE 113th St | Kirkland | WA | |
| Joyce Gertler | J. Gertler | 2100 Electric Ave | B'ham | WA | |
| Brian Harbor | [illegible] | 311 Whatcom St. | B'ham | WA | |
| Laura Woods | [illegible] | 2517 25th St | B'ham | WA | |
| Brian Hindman | B H | | B'ham | WA | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| DONALD CARTER | [illegible] | 2550 CASEY | BELLINGHAM | 98226 | |
| Debra Carter | Debra M Carter | 2550 Casey Rd | Bellingham WA | 98226 | lummibeader2@aol.com |
| Steve Tornblom | Steve Tornb[illegible] | 1001 22nd #3 | " | 98225 | |
| CHLOE FRENCH | [illegible] | 426 HIGHLAND DR | " | 98225 | chloefrench@comcast.net |
| DALE BALLANTYNE | [illegible] | 2331 HENRY | BHAM | 225 | |
| Nana Thebus | [illegible] | 2714 NW Ave. | BHAM | 225 | |
| Donna Rushing | [illegible] | 1209 15th St. | Bellingham | 98225 | |
| Leslie Conton | Leslie Conton | 1809 Wilson Ave | Bham | 98225 | |
| Lee Conton | Lee Conton | 2760 Old Fairhaven Pkwy | " | 98225 | |
| Michael J Gillis | Michael J Gillis | 1159 Newton St | Bham | 98229 | |
| Dane Kim | [illegible] | 714 N State | Bham | 98225 | |
| Jeanne Armstrong | [illegible] | PO BOX 3112 | Bham | 98227 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Janet Ott | [signature] | 2107 Lummi Shr RD | B'Ham | 98226 | jottenas.m[illegible] |
| JOANNE KOTJAN | Joanne Kotjan | 2107 Lummi Shore | B'ham | 98226 | Kotjan@mac.com |
| Lynne Lane | Lynn Lane | 2707 Lummi Shore Rd | B'ham | 98226 | lyn@nativeamerican.net |
| Willie Lane | [signature] | 2707 Lummi Shore Rd. | B'ham | 98226 | " "" |
| Janet E. Super | Janet E. Super | 8000 Dean Drive | Custer | 98240 | |
| Barbara D. Jimmy | Barbara D. Jimmy | 5914 Roberts Rd | B'ham | 98226 | — |
| Charles D Jimmy | Charles D Jimmy | 2520 Suchanon DR. | Everson | 98247 | — |
| Nadean Jimmy | [signature] | 2536 Suchanon DR. | Everson | 98247 | |
| Charlie A. Jimmy | Charlie A. Jimmy | 5914 Roberts Rd | B'ham | 98226 | — |
| Elvin Phillips | Elvin Phillips | 2554 Sulwhanon Dr | everson | 98247 | |
| Rita Charles | Rita Charles | 2594 Sulwhanon Dr | everson | 98247 | |
| Renee Jimmy | Renee Jimmy | 5914 Roberts Rd. | B'ham | 98226 | — |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Nicole Ocean | Nicole Ocean | 4[illegible] Westerly rd #203 Bellingham, WA | B'ham | 98226 | — |
| Ryan Knight | [illegible] | 1602 J Street Bellingham WA 98225 | Bellingham | 98226 | — |
| Lindsay Yule | Lindsay Yule | 718 Nash Hall | B'ham | 98225 | |
| Carol Frechette | Carol Frechette | ~~3924~~ 2209 ViewRidge Dr | B'ham | 98229 | |
| ~~Scott Blume~~ | [illegible] | 2622 | | | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Kirsti Charlton | Kirsti Charlton | 1410 Grant St | B'ham | 98225 | kirsticharlton@gmail.com |
| Fred L. Charlton | Fred L. Charlton | 1410 Grant St. | B'ham | 98225 | seventhcav@comcast.net |
| Matt Charlton | Matt Charlton | 1410 Grant St | B'ham | 98225 | |
| Elisabeth Stam | Elisabeth Stam | 1467 Iron St | Bham | 98225 | elisabeth.stam@gmail |
| Meri Charlton | [illegible] | 1410 Grant St. | B'ham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Darcie Donegan | D Don | 4207 Northridge Way | B'ham | 98226 | dadonegan@earthlink.net |
| Michael McCune | Michael McCune | 227 S Forest #2C | B'ham | 98225 | satyamjin@yahoo.com |
| Jon Durham | [illegible] | 2520 Peabody St. | B'ham | 98225 | jddurham@hotmail.com |
| Marta Dearstyne | Marta Dearstyne | 1540 Marine Dr | B'ham | 98225 | |
| Maryjane Murphy | maryjane Murphy | 2408 Walnut | B'ham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Marvin Fast | Marvin Fast | 3106 Thornton Rd | Ferndale | WA | |
| LYNN FAST | Lynn Fast | 3106 THORNTON RD | FERNDALE | WA | |
| Mike Hodgm | [illegible] | 3806 Gala Loop | Bellingham | WA | |
| Corrine DeLorenzo | Corrine DeLorenzo | 15 Mariner Circle | Bellingham | WA | |
| John Chadwick | John Chadwick | 4751 Birch Bay Rd. | Blaine | 98230 | |
| Isaac Pramodh | Pramodh | 1046 Moore St | Bellingham | 98229 | |
| Wendy Borgesen | Wendy Borgesen | 2202 Mill Ave | Bellingham | 98225 | |
| Elizabeth DeLorenzo | Elizabeth DeLorenzo | 215-Sudden Valley | Bellingham | 98229 | |
| JOHN Rollins | John Rollins | 1249 St. Paul | Bellingham | 98229 | |
| Brigit Coone | Brigit M Coone | 1701 E Maple St #202 | Bellingham | 98225 | |
| Aaron Loffler | [illegible] | 336 36th St #187 | Bellingham | 98225 | |
| Thom Sisk | [illegible] | 1246 ST. PAUL ST. | B'ham | 98229 | |

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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| Seth Cool | [illegible] | 711 Gladstone St. | Bellingham | 98225 | sethfcool@yahoo.com |
| Marissa Rosati | Marissa Rosati | 711 Gladstone St. | Bellingham | 98225 | Kokoabutta@hotmail.com |
| Murphy Evans | [illegible] | 1545 Marine Dr. | Bellingham | 98225 | |
| Patty Bean | Patty Bean | 3185 Blackjack Trail | Sedro Woolley | 98284 | |
| KIRK MELHORN | K. Melhorn | 4072 PACIFIC HIWAY | BELLINGHAM WA | 98226 | UH. ER. NO NOT YET. LUDITE |
| Kevin Cournoyer | K. Cournoyer | 2514 West St. | Bellingham, WA | 98225 | kjc@mac.com |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| JOSEPH SCOTT | [signature] | 2316 ELLIS ST | BELLINGHAM | 98225 | |
| Lisa McShane | [signature] | 1451 Grant St. | Bellingham | 98225 | |
| CHRIS MORGAN | [signature] | 3005 NW Ave, #8 | Bellingham | 98225 | |
| Barbara Christensen | [signature] | 1802 D St | Bellingham | 98225 | |
| Rose Oliver | [signature] | 3135 Peabody St | B'ham | 98225 | |
| Mitch Friedman | [signature] | 2831 Lyle | B'ham | 98225 | |
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| Printed Name | Signature | Address | City | Zip | email |
|---|---|---|---|---|---|
| PAT CURVIN | Wm Patrick Curvin | P.O. Box 2815 | Sudden Valley Bellingham | 98227 | pcurvin@comcast.net |
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## Draft Transcript of December 11, 2006 Public Hearing Comments

**John D'Onofrio**

John D'Onofrio. I live in Bellingham. I don't envy you, you're work will go along way in determining the health and the welfare of this community for generations to come and yet apparently you're subjected to enormous pressure to reach a pre-ordained conclusion that furthers the economic strategies at the Port of Bellingham.

It must be difficult, especially if you understand the people of Bellingham want the mercury removed. People for a Healthy Bay successfully gathered 6400 signatures in just a few short weeks in support of the Healthy Bay Iniative. The iniative was torpedoed by the city council but those signatures must make you somewhat uncomfortable. You have difficult jobs, squeezed as you are between the powerful economic pressures on the one hand and the wishes and the long term health of our community and our children. I don't envy you, but I do sincerely hope that you will do the right thing here and mandate the obviously best choice with respect to remediating the mercury by removing it now when it can be done. Thank you.

#12-L

GREGORY L. GLASS
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Lucille McInerney, Site Manager
Washington State Department of Ecology
Toxics Cleanup Program, Northwest Regional Office
3190 160th Avenue SE
Bellevue, Washington 98008-5452

Via e-mail: lpeb461@ecy.wa.gov

December 18, 2006

Dear Lucy,

I have been working with the Bellingham Bay Foundation (BBF) to assist community members in reviewing the long record of studies for the Whatcom Waterway Site, including the recently released October 2006 Draft Supplemental Remedial Investigation and Feasibility Studies. In addition to private funding sources, my activities have been partially supported by a Public Participation Grant from Ecology to the BBF. I appreciate your willingness to discuss various issues and provide additional information throughout the current public comment period. I am submitting these technical review comments on behalf of the BBF; many BBF and community members will be submitting independent comments as well. If further discussion regarding any of these comments would be helpful, please feel free to contact me.

In this letter I will focus on what I consider the fundamental issues related to identification of a preferred remedial action approach and comparative evaluations of alternative approaches. Brief comments on some more detailed technical matters are provided as an attachment.

Since recognition of the problem of mercury contamination associated with releases from G-P's chlor-alkali plant, and Bothner's detailed initial studies (UW thesis) in the early 1970's, there have been a number of characterization studies to investigate the nature and extent of contamination. The current RI/FS process since the mid 1990's in particular has provided much site characterization information. I believe there are some gaps in our understanding of site conditions – among others, comparatively little information on fish tissue mercury concentrations, sparse data to define the three-dimensional patterns of sediment contamination 40

(particularly in the more contaminated inner waterway areas), no depth profile mercury data for 41
the Starr Rock area, and little if any examination of the mechanisms and processes for production
and mobilization of methylmercury. The limited site-specific information on methylmercury
processes, and factors potentially affecting such processes, makes it difficult to predict changes
in mercury cycling or impacts that could accompany changes in conditions in the future.
Nevertheless, the available site characterization information appears to provide an adequate basis 42
for identifying various possible remediation approaches.

The principal problem with the current documents, based on my review, is that an unduly
restricted set of alternatives has been identified, which has major effects on comparative
evaluations among alternatives. Mercury is the contaminant that drives cleanup decisions for the
Whatcom Waterway (leaving aside, for the moment, ASB sludge issues). Mercury is a persistent
contaminant that cannot be eliminated through active treatment or natural degradation processes.
(Mercury is also a bioaccumulative contaminant with recognized toxicity concerns for young 43
children; it was selected as the first such PBT contaminant to be addressed in Washington [1]).
There are only a small number of generic options for where mercury, as a persistent contaminant,
will end up. The Draft FS covers these options, which include leaving mercury in situ in the
waterway, creating a confined aquatic disposal site, creating a confined nearshore disposal
facility, or shipping contaminated materials to an uplands landfill. In contrast, the Draft FS
considers a very limited set of dredging and capping options. Dredging options are developed
based only on one of two navigation channel concepts. Alternatives 2, 3, 7, and 8 assume the
existing, designated deep navigation channel will determine dredging requirements, although it
appears the Port of Bellingham has every intention of deauthorizing this currently authorized
channel as part of redevelopment plans for the inner Whatcom Waterway. Capping options are 44
even more limited, with a unitary design cap thickness proposed across multiple alternatives
based on evaluations of various modes of sediment/cap physical disturbance. Alternatives
incorporating different combinations of dredging depths for contaminated sediment removal and
capping thicknesses for residual sediment contamination are omitted from the Draft FS, but
should be considered.

"...[T]here is considerable debate regarding the permanence of a capping remedy for
highly contaminated material and concern regarding the potential for extreme events such as
storms, floods, or earthquakes to disrupt a cap. There is also an inherent disadvantage in that
contaminated material remains in the aquatic environment. Capping remedies must be designed
fully considering these factors and with an appropriate level of conservatism" [2]. With respect to
possible future impacts in the waterway and adjacent areas of Bellingham Bay, dredging and
removal of mercury-contaminated sediments is a permanent remedy. In situ capping is not

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1 See Washington State Mercury Action Plan, January 2003, Ecology Publication No. 03-03-001.

2 Michael R. Palermo, 2001, "A State of the Art Overview of Contaminated Sediment Remediation in the United States".

permanent; extreme events and processes anticipated or unforeseen will continue to have a
potential for mercury release. Given the persistence of mercury, the timeframe for continued
performance of an in situ capping approach is in perpetuity. Experience with sediment capping 45
to date amounts to only a few decades, and despite rational engineering estimates and models
uncertainties remain regarding long-term performance of caps. (Fate processes affecting mercury
in sediments remains an active area of research). This difference in permanence between
remedial approaches means that benefits should accrue when the mass of mercury, and the peak 46
concentrations of mercury in sediments, are reduced through additional dredging [3,4].

Using information on mercury depth profiles from RI sediment cores and planned dredging depths and volumes, I estimated the additional removal of mercury in FS Alternative 7 versus Alternative 6. The number of sediment cores is limited, but it appears the additional mercury removal under Alternative 7 could approach or exceed two tons from the inner Whatcom Waterway (Sediment Units 2 and 3). Both the conceptual site model and RI sampling results indicate that there is a gradient in sediment mercury concentrations and amounts with distance from the points of release in the Log Pond before construction of the ASB. The inner waterway is therefore the area of most interest for reducing mercury through additional dredging.

Within the range of achievable cap thicknesses, confidence in the long-term performance
of the cap to isolate and sequester contaminated sediments will increase with increasing
thickness. Different processes can physically affect a cap. The resulting impacts may depend on
the cumulative occurrence of multiple processes, some episodic and some continuous, acting in
concert. Consider bioturbation to a depth of 18 inches. For an intact three-foot thick cap, such
bioturbation would not affect contaminated sediments beneath the cap. Bioturbation occurring
after erosion of two feet of the three-foot cap, however, would result in mixing upwards of
contaminants with potential adverse impacts. That same degree of erosion (e.g., after a major
storm or seismic event) on a six-foot thick cap would still leave a protective four-foot thickness
for sequestering contaminated sediments. In that case, bioturbation to a depth of 18 inches would
not reach the contaminated sediments beneath the cap. Thicker caps provide an added factor of 47
safety and increase confidence in the long-term performance of the remedy [5].

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3 The Draft FS appears to recognize this principal in Section 7.2.6 where Alternative 6 is granted a measure of increased protectiveness compared to Alternative 5 as a result of a modest increase in removal of contaminated sediments at depth – although elsewhere it states that there are no added benefits to additional dredging of deep sediments or adequately capped sediments.

4 The EPA ROD (2005) for the Lake Onondaga, New York Superfund Site includes dredging and removal of additional contaminated sediments from below a planned cap to increase confidence in the long-term effectiveness and protectiveness of the remedy.

5 Palermo discusses the additivity of calculated cap thickness components and application of a factor of safety on top of the result in designing a cap. See Michael R. Palermo et al., 2002, "White Paper No. 6B - In-Situ Capping as a Remedy Component for the Lower Fox River"

**A conceptual model for additional alternatives.** The Draft FS provides a dichotomous set of alternatives with respect to the inner Whatcom Waterway, based on the assumed future navigation channel requirements. The restrictions on future bathymetry for the inner waterway imposed by the assumption of a deep navigation channel – despite the stated intent to deauthorize that channel and replace it with a shallow one – result in negative evaluations for habitat improvements and consistency with future land use plans. If the development of alternatives is instead approached based on the principles described above (benefits of more mercury removal and of thicker caps), however, a series of incremental alternatives can be envisioned.

An approach commonly used to lay out a series of incremental alternatives can be easily
applied to the Whatcom Waterway Site. The conceptual model for this approach is a plotted 48
curve (X-Y plot) showing the relationship between an index or criterion value and the volume (equivalently, the cost) for removal of contaminated materials from the site, with appropriate consideration of capping of residual contaminated materials left at the site. The index or criterion used could be mercury concentration in sediments, mass of mercury remaining in situ after remediation, depth of dredging, or other parameters – for the purposes of illustration here, it does not matter. More complete cleanup actions are almost always represented on such plots by a curvilinear relationship versus the index (i.e., less bang for the buck at the margin). Evaluation of a small number of specific alternatives in an FS is often used as a means of approximating the entire curve.

Note that the existing Draft FS alternatives can be positioned on this type of plot. For example, the volumes of dredged waterway sediments (excluding the ASB sludges) would increase from 68,000 CY to 1.26 million CY for Alternatives 4 to 8, as plotted on the Y axis. (Or costs could be plotted). The mass of mercury remaining in situ, or another suitable index parameter, could similarly be plotted for the X axis for these same alternatives. The curvilinear relationship is apparent. Alternatives 5 and 6, with only a minor difference in dredging volumes, would be nearly co-located on this plot, and would be quite far from Alternative 7. The curve connecting these plotted positions, however, would represent a continuous series of additional alternatives with progressively more removal of mercury from the waterway – and, according to the principles examined above, progressively greater benefits.

Now, for the purposes of illustration, abandon the need for maintaining the deep navigation channel in the future and assume the proposed channel incorporated in Alternative 6 instead. The conceptual dredging plan for Alternative 6 includes overdredging below the planned channel depth to provide protection (capping) and allow for future maintenance
dredging. Increasing mercury removal (i.e., moving up the curve on our plot) would be achieved 49
by additional overdredging compared to Alternative 6. This would also allow for a thicker sediment cap if incremental dredging volumes were replaced with clean sediments. A thicker cap could maintain exactly the same bathymetry in the inner waterway as would occur with Alternative 6, and thereby would have the same benefits for habitat improvements and

consistency with planned future land uses. Moreover, protectiveness and confidence in the long-term effectiveness and performance of the remedy would be increased. Progressively more dredging would lead to Alternative 7 – except that a thick cap could be incorporated to match the Alternative 6 bathymetry (i.e., it would be a modified Alternative 7, or depending on how dredged sediments are handled a modified Alternative 2 or 3). The volumes of additional dredging could be forecast based on generic dredging (uniform added depth increment) or on an approach in which further data collection is used to maximize cost-effectiveness (i.e., a "worst-first" dredging approach based on better three-dimensional definition of contamination patterns). Selecting a remediation alternative that is permanent to the maximum extent practicable would in this approach consider the full range of possibilities, and not just widely separated and disparate Alternates 6 and 7.

**Comparative evaluation of alternatives.** I strongly recommend that Ecology revisit the comparative evaluation of alternatives for the Whatcom Waterway Site, incorporating the new alternatives and principles discussed above. Efforts to "mechanize" or "standardize" the methodology for a disproportionality analysis under MTCA (WAC 173-340-360) have not met with success. The resulting flexibility in analysis approaches imposes a strong requirement for good judgment, both for evaluating single criteria and for the balancing of varying costs and benefits considering all criteria together.

Additional sediment dredging and disposal, plus thicker sediment capping, will impose 50
greater costs compared to Alternative 6. There will also be some degree of increased short-term risks and impacts from resuspension of materials during dredging, which appropriate mitigation measures may limit in magnitude. Additional dredging and capping actions will also extend the time to completion of cleanup actions somewhat, but arguably not sufficiently to affect public acceptance or near-term impacts. (The RI/FS characterizes current impacts as minimal). These factors should be balanced against the following: greater overall protectiveness, more permanent cleanup with respect to future impacts to the waterway and surrounding marine waters, increased confidence in the long-term effectiveness of the cleanup, good implementability (similar dredging projects have been completed), and – at least based on public comments at the recent hearing in Bellingham – consistency with expressed public interest in more removal of mercury from the waterway. Both benefits and costs increase with more complete cleanup actions. A
balancing of those benefits and costs is required to identify a cleanup plan that is permanent to 51
the maximum extent practicable. The negative evaluations in the FS of deep dredging alternatives based on habitat and land use criteria can be eliminated.

Costs are an important evaluation criterion in the disproportionality analysis under MTCA. It is imperative that all appropriate costs be considered when comparing alternatives. I spent some time reviewing the detailed cost spreadsheets in FS Appendix B, together with supporting information in the description of alternatives text and in Appendix A. There appear to be a number of inconsistencies and other problems with the costs. Ecology should carefully review the cost estimates.

Several factors appear to me to introduce bias into the cost comparisons. Except for
Alternative 2, a uniform long-term monitoring cost is used for all alternatives, based on best
professional judgment ($640,000). That estimate may turn out to be quite low; a long-term 52
monitoring plan is not defined until later in the process under MTCA. What is important for the
comparative evaluation of alternatives, however, is the differential costs for monitoring among
alternatives. Conceptually, this should be based on the characteristics of residual contamination
in the waterway, the thickness of protective sediment caps, and similar factors. Where the
differences in post-remediation conditions among alternatives are substantial and the potential
monitoring period is long, these differential monitoring costs may be substantial.

Costs for alternatives also need to include the costs for maintenance and repairs required 53
to sustain long-term effectiveness [6], as well as any additional remediation (e.g., dredging) needed
to address mobilized contaminants. As with long-term monitoring, it is the differential
maintenance and repair costs that are most important for comparative evaluations of alternatives.
Conceptually, increased reliance on capping, and on thinner versus thicker caps, should be
associated with higher costs to maintain effectiveness for the long term. The FS does not include
any costs for long term maintenance and repair. Incremental costs with in situ capping of most
contaminated sediments – for an indefinite future timeframe – should be substantially higher than
with removal of most contaminated sediments. (The costs of repairs for the Log Pond interim
action cap, within the first few years after installation, are instructive in this regard).

The dredging profiles for Alternative 7 and other alternatives based on maintaining the 54
currently authorized deep navigation channel use dredging depths based on the authorized
channel depths plus overdredging to allow for capping and future maintenance dredging. This 55
approach does not define dredging depths based directly on contaminant concentrations. It is
possible that dredging volumes therefore include clean materials whose removal would not be
required for cleanup. I compared the dredging depths to the available sediment core depth
profiles from the RI. Although the data are limited, it does appear that a portion of the dredging
volume given in the FS for Alternative 7 represents sediments with mercury concentrations
below the SQS. This unnecessarily inflates dredging volumes and costs for cleanup.

According to FS Table A-1, the total sediment capping volume for Alternative 7 is
slightly less than for Alternative 6. Cleanup actions at the ASB are identical under both
alternatives, meaning clean capping materials would be available in the same volume from the
ASB. Yet the cost spreadsheets in Appendix B show substantially higher costs for capping under 56
Alternative 7 because a large proportion of the capping volume is assumed to be purchased rather
than supplied from the ASB berm. It should be possible to sequence the work under Alternative
7 so that ASB materials could be used as in Alternative 6, thereby substantially reducing costs.

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6 Noted by Palermo et al. 2002, op. cit.

The costs for capping in Alternative 6 are based on a three-foot thick cap (see FS Appendix B). In response to questions during the public comment period, Ecology has noted that final cap design will occur later in the cleanup process, and has indicated that final cap thickness could be between three and six feet. A six foot cap would require overdredging and disposal of a considerable additional volume of contaminated sediments under Alternative 6, as well as additional capping volumes. Costs for these additional dredging, disposal, and capping actions would be substantial but are not included in the FS cost estimates. Adoption of a six foot cap requirement would lessen the cost differential between Alternatives 6 and 7 and would reflect exactly one of the "intermediate" new alternatives in the conceptual model discussed above. 57

If the assumption that a deep navigation channel needs to be maintained in the future is dropped, the ancillary costs mentioned in several places in the FS (but not included in the Appendix B spreadsheets) for redevelopment of shoreline structures to be compatible with the deep channel will become moot. 58

**Summary.** The objectives of faster, better, cheaper are often cited as criteria for deciding on actions, and are included in the listed Pilot Demonstration project goals statements. Faster and cheaper are often easier to define and meet; the evaluation of better can be more difficult. Based on my discussions with community members, many feel that the Draft FS and its selection of preferred alternatives did not evaluate better appropriately. The recasting of alternatives discussed in this letter reflects the principles that many community members are using to define better: more removal of mercury from the waterway, thicker sediment caps on residually contaminated materials, and measures that increase confidence in the long-term effectiveness and protectiveness of the remedy for a persistent, bioaccumulative, toxic contaminant such as mercury. 59

Referring to the conceptual model for defining alternatives described herein, options in lieu of FS Alternatives 5/6 that would result in more mercury removal from the waterway can be identified. With modification to incorporate more refined dredging plans and thicker caps, Alternatives 3 and 7 are options for disposal of larger volumes of dredged sediments. Individuals differ in their preferred choices between these disposal options, but either would support more dredging and removal of mercury. If the costs for dredging to the extent included in these alternatives is found to be disproportionate compared to the benefits, based on a revised analysis, the conceptual model shows how moving up the curve from Alternative 6 would provide for progressively greater mercury removal. (Alternatives 3 and 7 have significantly different costs, largely because of the differences in ASB status post-cleanup). The preferred cleanup alternative would then be the one with maximum practicable mercury removal, as evaluated through a permanent to the maximum extent practicable analysis. 60

Sincerely,

Gregory L. Glass

Gregory L. Glass

Gregory L. Glass
Attachment to Comments on October 2006 Draft Supplemental RI/FS
Whatcom Waterway Site

**Additional Specific Comments**

1. In its evaluations of the alternatives, the Draft FS includes numerous projected comments regarding public concerns. Those projected comments should be replaced by a summary of actual public concerns as expressed through this comment period. 61

2. The bioaccumulation screening level (BSL) of 1.2 mg/kg mercury in sediment, carried over from earlier evaluations, is characterized as very conservative. The comparison to the PSDDA/DMMP value of 1.5 mg/kg is meaningless; that PSDDA value was assigned on an ad hoc basis and is not defended within the program as scientifically supported. Of the three conservative factors noted in the FS, one is of minimal effect; nearly all of the mercury in fish 62
and shellfish tissue in methylmercury. The other two factors – diet fraction and spatial scale – need to be balanced against the lack of a child exposure calculation and the statistical weakness of the regression analysis (as I noted in previous comments). A typically higher consumption rate-to-body weight ratio for children versus adults results in a lower calculated BSL value for 63
children (as exhibited in the mercury screening levels in the Phase I Human Health Risk Assessment for the Lower Duwamish Waterway site). Mercury is of particular concern for neurological and cognitive effects in young children. Given these countervailing factors, it is not at all clear that the calculated BSL is conservative.

3. The degradation of high organic materials in sediments can lead to gas generation, which has been described as difficult to evaluate with respect to potential contaminant mobilization and 64
transport, as well as cap stability over time (see for example Palermo et al. 2002). The Whatcom Waterway has a large amount of wood waste present. I did not find any consideration in the FS of possible consequences of capping wood waste in place under certain alternatives.

4. The detailed development of final cap designs (including thicknesses), final long-term monitoring plans, and other components of the adopted cleanup plan typically occurs well after the RI/FS stage of the MTCA process. Ecology needs to be sensitive to the fact that these later decisions can significantly affect the differential costs and cost comparisons among alternatives, 65
which are part of the FS. If one or more preferred alternatives are to be identified in the FS, the potential effects of these deferred design decisions need to be explicitly recognized. The costs for Alternative 6, for example, look much different if a six foot cap and overdredge requirement if applied, versus a three foot cap.

5. EPA's ambient water quality criterion for mercury should be an ARAR for the Whatcom Waterway site. EPA has adopted a novel approach for this criterion value, basing it on a fish

tissue concentration for mercury rather than an ambient water concentration. The stated nominal value of 0.3 mg/kg wet weight mercury in tissue is based on a fish consumption calculation using 66
a consumption rate of 17.5 g/day. EPA notes that this value can be modified on a site-specific basis to account for populations with higher consumption rates. The likely result for the Whatcom Waterway would be a criterion at or below 0.1 mg/kg. (See the draft report by Weiss and Lippert 1997, where this type of adjustment was also applied). Note that this criterion would 67
be an order of magnitude below the FDA recommendation at 1.0 mg/kg. The history and current status of fish and shellfish tissue sampling results should have been presented in a more focused manner in the RI report; I found it difficult to assemble and review this information. The available data set, especially for recent fish tissue levels, appears to be quite limited.

6. Studies at the Lavaca Bay, Texas site showed that relatively small mass inputs of mercury via the ground water pathway could have a disproportionately large impact on bioaccumulation and tissue levels. The RI/FS analysis of potential ground water inputs notes that ground water 68
transport of mercury would be too small in mass to have any important effects on sediment mercury levels. The mass-based evaluation appears to miss the potential importance of bioaccumulation and tissue effects not mediated by increased sediment mercury concentrations, as identified in the Lavaca Bay studies.

7. I collected and reviewed a large number of open-literature reports related to mercury cycling in the marine environment. In general they do not support a strong, direct relationship between total mercury in sediments and methylmercury in fish and shellfish tissues. Many other factors influence the methylation, mobilization, and cycling of mercury. Where changes in conditions affect these influencing factors (and not as a result of direct changes in mercury mass loadings), mercury cycling can be affected. For example, a recent article noted that rockfish in waters near net-pen salmon farms in British Columbia had persistent increased tissue levels of 69
mercury as a result of altered sediment biogeochemistry (see Debruyn et al. 2006, "Ecosystemic Effects of Salmon Farming Increase Mercury Contamination in Wild Fish", ES&T 40 3489-3493). Other studies indicated that organic-rich locations such as wetlands have increased methylation of sediment mercury. The plans for Whatcom Waterway include extensive habitat improvement measures, which to the degree they are successful may alter the existing sediment biogeochemistry at the site. It is unfortunate that the RI/FS does not include evaluations of processes that affect mercury cycling from sediments at this site, or how changes in those processes could influence future mercury mobilization. Research in these issues is continuing worldwide. The uncertainties associated with the complex cycling of mercury in the environment are in large part what differentiates in situ capping and removal with respect to permanence and long-term effectiveness.

8. The three natural recovery cores were collected at locations outside the inner Whatcom 70
Waterway. Extrapolation of the results from those cores to the inner waterway is questionable because of differences in flow patterns and velocities. The extrapolation of recent sediment 71
deposition rates to the future includes an assumption of unchanged conditions. The Nooksack

River outflow channel could change course, significantly affecting sediment loads to Bellingham Bay and the Whatcom Waterway; I have also been told that an intention diversion of part of the flow is under consideration to improve fisheries. I have also been told that a major erosion reduction project in planned or underway in the lower Nooksack drainage. Land use changes over time and effects due to climate change could also modify sediment loads. How would evaluations change under a "what if" scenario of much lower sediment inputs to Bellingham Bay?

9. The long-term effectiveness of institutional controls that would prevent disturbance of constructed caps in the waterway has not been demonstrated. I believe it is likely that institutional controls for a designated consolidation and disposal facility (whether that be the ASB or an uplands landfill) would be more effective than for a waterway where there would be no visible evidence or observable barriers related to the in situ cap. 72

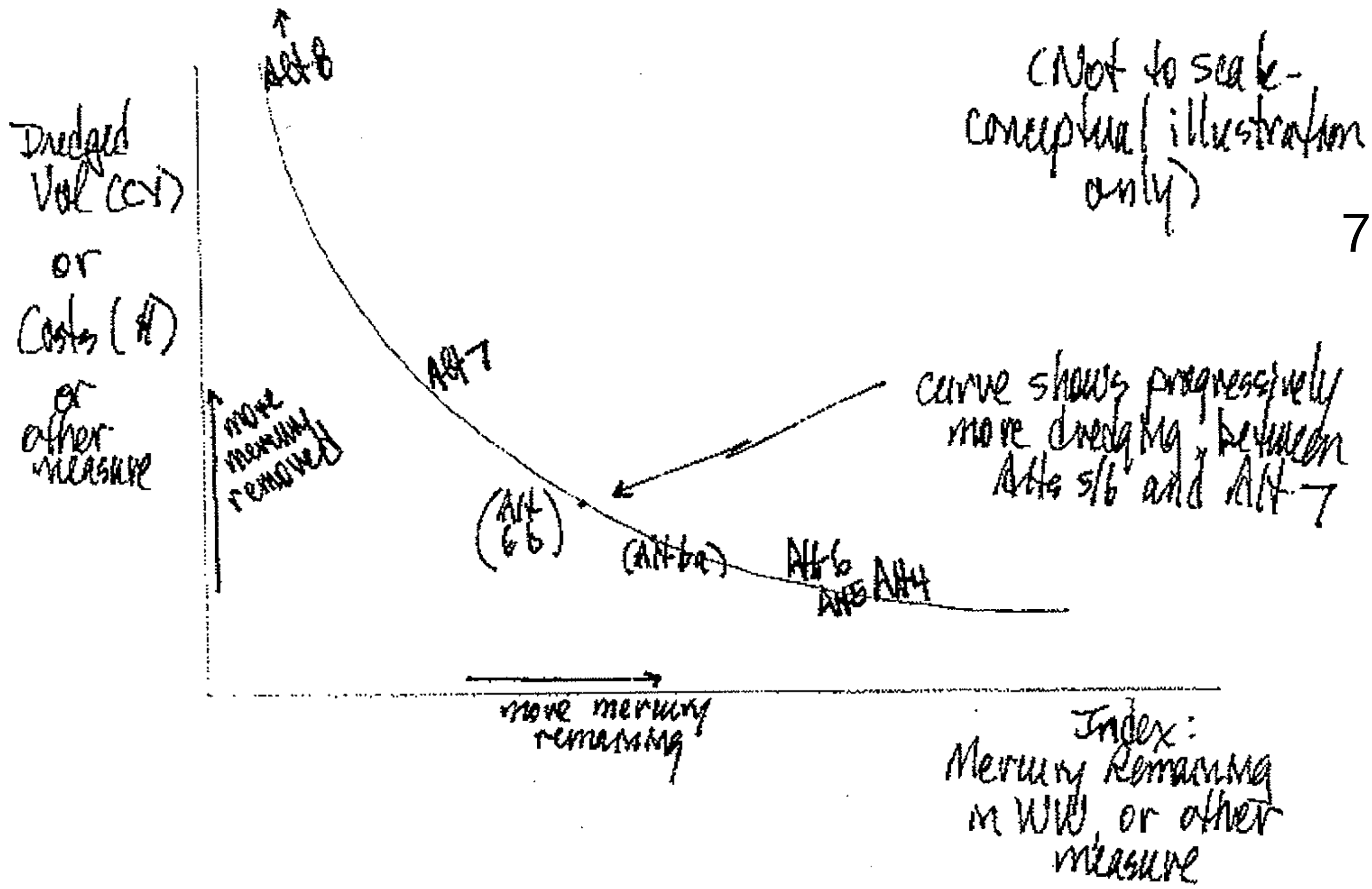
10. Under current conditions the ASB sludges are not in communication with the waterway or adjacent marine waters. The cumulative enrichment ratio analyses do not take that factor into account. The ASB sludges only come into potential communication with marine waters if the existing berm is breached. 73

11. The summary of shallow subsurface mercury concentrations in the RI (Figure 5-10) does not include the results from recent (Year 5) monitoring at the Log Pond. Mercury over 150 ppm was reported at the edge of the Log Pond near the waterway in that monitoring report (see Appendix I of the Draft RI). Given the locations of discharges to the Log Pond historically and the relatively few cores providing depth profiles for mercury, it is likely that maximum concentrations exceed those already sampled. I also could not match the values given in Figure 5-10 to the waterway cores; for example, at location 77 the reported concentrations for 0 to 2.1 and 2.1 to 3.9 feet were 11 and 7.0 ppm mercury, respectively, yet Figure 5-10 gives a value of only 6.2 ppm. All of the relevant information should be included in this and similar RI figures, and the values shown should be re-examined. 74

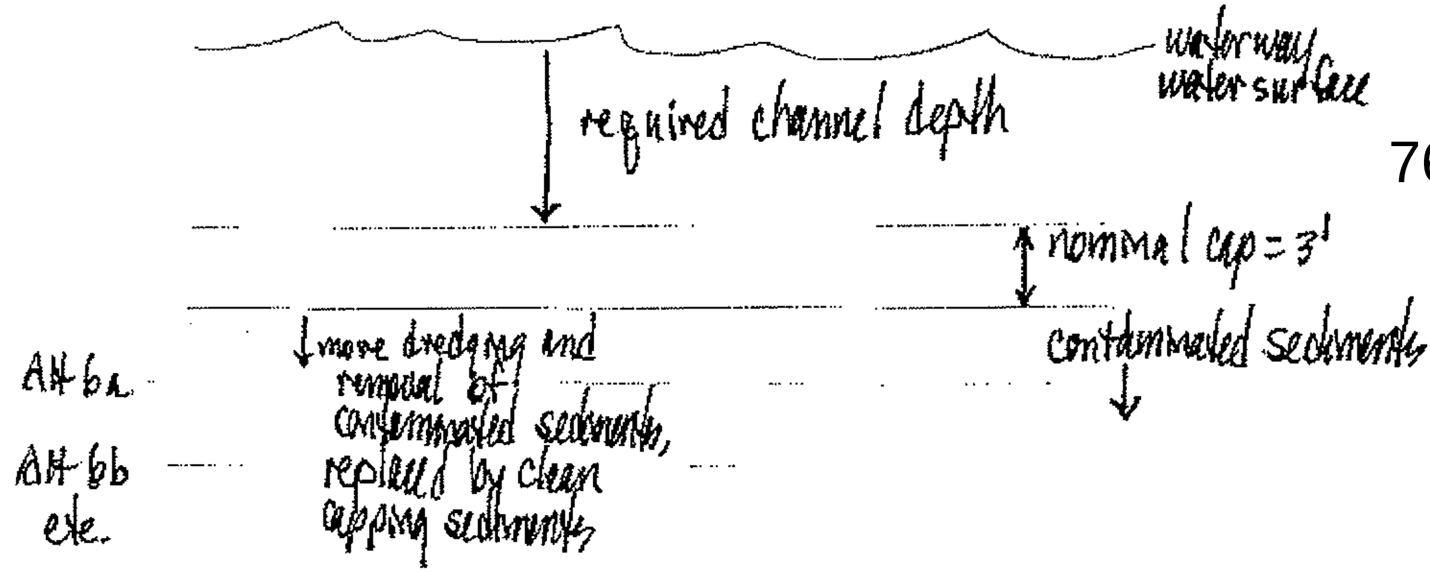
#12-N

Whatcom Waterway Site
Draft RI/FS, October 2006
Comments: Greg Glass

Illustration of Model for Alternatives




75

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**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Anna Evans**
Hi there, I'm Anna Evans. 1545 Marine Drive. I'm also the acting director of the Bellingham Bay Foundation. I would just like to reiterate the thank you to the Department of Ecology for hosting this event tonight. I think it is very important and necessary that we're here.

I would also like to comment because of the reschedule. Unfortunately this meeting tonight conflicts with two other very high profile community meetings and I know there are a lot of concerned citizens who had to make a difficult choice this evening about where to be. So I think that those of us who are here really shows our commitment to this cause.

I would like to bring some information to this discussion that might suggest the ways in which the voices of those other concerned citizens might support and reiterate what we're hearing here tonight.

I would like to speak to the MTCA rankings of the various alternatives. We know that public concern is one of the elements that you all pay attention to when you're ranking various alternatives. We don't know much about how you determine those public concerns other than the land use changes that have gotten a lot of publicity.

The Bellingham Bay Foundation in an attempt to assess public concerns commissioned two polls 77
last Spring – in April of 2006 we contracted with Stuart Elway in Seattle,, conducted a poll here in Whatcom County added 3 questions on to his regular monthly poll. This poll had an error ratio of 6.2 percent I believe. And in the question "What most concerned citizens about the Whatcom Waterway cleanup" Three to 1 people chose making sure that contaminates are safely disposed of as their principle concern about the Whatcom Waterway cleanup.

That poll was followed up in June by a more detailed, extensive survey that had an error rate of 3 percent. That was conducted by Applied Research Northwest here in Bellingham. In that survey 81 percent of local residents said that a thorough cleanup was their primary concern for the Whatcom Waterway project.

They're sure all the things that are happening down there are very exciting but first and foremost people wanted to see that there was a thorough cleanup

Those folks were asked if a thorough cleanup were more expensive, found to be more expensive 78
to remove mercury rather than to leave it in place that was one of the questions, would that change their opinion and 75 percent said no, they would be willing to pay more for a more thorough cleanup of the Whatcom Waterway and the Georgia Pacific site.

So I will submit those surveys as part of the written record for you all to look at more closely. I would just like to emphasize again that this issue can't be more important and I think it's clear that the residents of this town and this county really want to see this mercury removed from our natural environment, not just buried in place. Thank you very much.

Commenter No. Name / Organization
13 Bellingham/Whatcom Chamber of Commerce

Commenter Submittals:
A Letter dated Nov 21, 2006 Kenneth Oplinger (President/CEO)

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| 2 | EIS | Marina comments | Support for marina | 6.8 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

BELLINGHAM/WHATCOM
CHAMBER OF COMMERCE & INDUSTRY

21 November 2006

Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452
**VIA E-MAIL: lpeb461@ecy.wa.gov**

Ms. McInerney :

On behalf of the Board of Directors of the Chamber and our 800 members, I am writing to express our thoughts on the clean-up of the Whatcom Waterway Site in Bellingham, Washington.

After reviewing the materials from the Department of Ecology, **we are in support of Alternative #6 as the preferred mechanism for cleaning the site and preparing it for redevelopment.** 28

The 137 acres of land which make up the former Georgia Pacific site, and were transferred to the Port of Bellingham in January 2005, provide Bellingham and Whatcom County with an outstanding opportunity to return former industrial land which has been heavily contaminated to a more open, public use. The unique partnership between the Port and the City of Bellingham will allow the site to be fully redeveloped, providing housing, jobs, recreation, waterway access, and a full gamut of services to our community.

In cleaning the contaminants on the site, we believe that we must choose the option which provides for a nexus between public safety, redevelopment potential and cost. We believe Alternative #6 provides for this 29
nexus by ensuring the full site can be used for redevelopment (including development of a public marina in the old GP Ponding Basin), while using approved methods to dredge, cap and provide for shoreline stabilization.

Alternative #6 has received a High overall MTCA ranking, meets all MTCA threshold criteria, and its restoration time frame is amongst the lowest of the eight alternatives being reviewed. Furthermore, MTCA ranks the overall benefits of Alternative #6 as High, finds the costs of the clean-up to be proportionate to the benefit, and that the alternative is permanent to the maximum extent practicable.

Many, many citizens of Bellingham and Whatcom County are excited about the potential of this important redevelopment project, and the membership of the Bellingham/Whatcom Chamber certainly certainly among them. Alternative #6 will provide our community with the best opportunity to clean this site, and return it to the use of the community. **Please support Alternative #6.**

Sincerely,

Kenneth Oplinger, President/CEO
Bellingham/Whatcom Chamber of Commerce & Industry

1201 Cornwall Avenue, Suite 100, Bellingham, WA 98225
Ph. 360/734-1330 Fax 360/734-1332 ken@bellingham.com

| Commenter No. | Name / Organization |
|---|---|
| 14 | Bensen, Marvin |

Commenter Submittals:

A  Comment sheet dated Dec 15, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General preferences | 5.1 & Table 5-2 |
| 2 | FS | Dredging methods | Favors mechanical dredging | 5.19 |
| 3 | EIS | Navigation channel changes | Opposes changes to Inner Waterway | 6.7 |
| 4 | EIS | Land use changes | Opposes change to mixed-use | 6.6 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

# How to comment to the Department of Ecology 28

To submit written comments on the 2006 ***Draft Remedial Investigation/Feasibility Study*** and ***Draft Supplemental Environmental Impact Statement***, you may use the form below and leave it with us and we will pass your comment to DOE. Or you may submit your comment to:

> Lucille T. McInerney, P.E., Site Manager, at Ecology's Northwest Regional Office,
> 3190 160th Avenue, Bellevue, WA 98008-5452,
> by phone at (425) 649-7272 or by email at lpeb461@ecy.wa.gov.

*(name and address optional)*

Name: Marvin Bensen

NEW ADDRESS

Marvin L. Bensen
Hamilton Place
4625 Cordata Pkwy. #228
Bellingham, WA 98226-7104

12/15/2006

City:

The documents are designed to describe the results of the environmental investigations and evaluate the feasibility of several sediment remediation alternatives for the Whatcom Waterway site. The documents also identify a preferred remedial alternative. Do you have any comments about whether the evaluation performed in each of these documents is accurate and/or complete? If so, please describe:

No Capping in the waterway. 29

Clean it out clamshell style. 30

Do Not Vacuum out.

Its a Federal Waterway keep it.

Get authorized for more than 30' 31

Make it usable by the newest ships.

Both GP's 2 docks & Ports 2 docks will make a great Container Port.

Note - yes their is 200 Acres behind the Docks 32

yes their is 1½ Miles of Rail Riteaway

yes moving BNSF mainline is funded

yes 2 Bridges have been funded

yes land is zoned for it.

yes we have better freight mobility than Seattle or Tacoma — by using Canada's and the Sumas Rail Line.

Your Documents ARE NOT Complete you did not give us a choise for a full clean up of waterway.

| Commenter No. | Name / Organization |
|---|---|
| 15 | Blethen, John |

Commenter Submittals:

A E-mail dated Dec 18, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Additional habitat | Dredging and backfill in Inner Waterway | 6.10 |
| 2 | EIS | Habitat backfill | Dredging and backfill in Inner Waterway | 5.22 |
| 3 | RI | Additional data collection | More data collection in Inner Waterway | 4.10 |
| 4 | FS | Project funding | Grant funding for ASB cleanout | 5.26 |
| 5 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| 6 | EIS | Additional habitat | Additional habitat in ASB as part of Alt. 3 | 6.9 |
| 7 | EIS | Marina comments | Opposes marina, favors dry-stack storage | 6.8 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

28

**From:** john Blethen [mailto:jhblethen@hotmail.com]
**Sent:** Monday, December 18, 2006 8:42 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway Clean-up

It is very important that we clean up not just cover over the mercury in the Whatcom Waterway. 29
It is also important that the head of the waterway be dredged and replaced with clean
sediments from another site as this portion of the water way, while it may be free of mercury ,is
heavily contaminated with industrial and wood waste and is extremely very anerobic, the 30
waterway needs to be restored to a more natural condition.
I am concerned that MTCA money ($15 million) is being used to clean up the ASB to provide a
marina for a small minority of boat owners while the entire ecosystem of Puget Sound and its 31
environs is collapsing.This amounts to a subsidy of the marina project at a time when bay
wide restoration is critical
I favor using a portion of the ASB as a disposal site for waterway contaminates with the balance 32
of the ASB used for habitat restoration per the Anchor Environmental concept with drystacking
for small boats.

33

30

31

Commenter No. Name / Organization
16 Boland, Loraine

Commenter Submittals:
A E-mail dated Dec 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

**From:** ELBOLAND@aol.com [mailto:ELBOLAND@aol.com] 33
**Sent:** Thursday, December 14, 2006 4:08 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/EIS Public Input

Dear Ms McInerney,
We are Bellingham residents who frequent Bellingham Bay & enjoy its many attributes. We have reviewed the draft RI/FS and EIS documents for the Whatcom Waterway site. We strongly support the preferred alternatives 5 & 6 as they are currently documented. Thank you for your time and commitment to the future of the area. 34
Regards,
Loraine Boland & Raymond Nelson

Commenter No. Name / Organization
17 Botwin, Anne

Commenter Submittals:
A E-mail dated Dec 5, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| 2 | FS | Capping costs | Cap monitoring costs | 5.11 |
| 3 | FS | Capping costs | Costs of repairs and contingent remedies | 5.12 |
| 4 | RI | Water quality | Water quality and capped sediments | 4.7 |
| 5 | FS | Residuals and water quality | Residuals and water quality during dredging | 5.16 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

34

**From:** Anne Botwin [mailto:gotjoy@openaccess.org]
**Sent:** Tuesday, December 05, 2006 10:46 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Mercury cleanup at Whatcom waterway and old GP site

Dept. of Ecology:

I am writing to urge you to take a scientifically objective long-range view of how best to clean up the mercury from Whatcom Waterway and the old GP site. I do 35
not pretend to have the answers or even a definite point of view, except to keep our waters as clean as possible. I am afraid that Bellingham city officials are too easily swayed and will ignore the best available science in favor
of an economically or politically expedient solution. I am depending on your 36
experts in the Dept. of Ecology to keep your perspective and scientific objectivity and put our environment FIRST!

If we dredge and fill the mercury residue, wouldn't the cost of annual checks of #12-K
the cap and possible repairs eventually cost as much or more than removing as much mercury as we can now? What is the risk of slowly poisoning the water
and the people living or working here in the future? Are we just passing the buck 37
and the potential danger to future generations?

Alternatively, if we try to remove as much of the mercury as possible, what is the 38
real likelihood that some of it may spill and contaminate the waterway anyway? How realistic is it to think we can take adequate precautions to prevent a spill? Would it be better in the long run, both economically and environmentally, to do a thorough clean-up now?

These are complex questions, but they need to be asked and answered. Thank you for helping us in the important effort to clean up the toxic waste left behind by GP.

Anne Botwin
Bellingham, WA
(360) 733-5353

Commenter No. 18 — Name / Organization: Brenthaven

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Dec 5, 2006 | Harvey Stone (Owner) |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| 2 | EIS | Land use changes | Support for mixed-use development vision | 5.11 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

35

December 5, 2006

Ms. Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Re: Whatcom Waterway Project

Dear Ms. McInerney,

My company has been in business in Bellingham since 1985 and our corporate headquarters are adjacent to the Bellingham waterfront. We originally established our business in Bellingham because of an appreciation of the wealth of resources in the community-natural, cultural and economic. A few years ago we were recognized as Business of the Year by Business Pulse Magazine and take great pride in our contribution to the local economy.

We understand that success in business comes from good strategic thinking, sound business principals and a strong ethical foundation. The work conducted by the Port of Bellingham these past few years to address the opportunities and challenges associated with the Waterway Project has impressed me because it has been done with the highest degree of professionalism and dedication to our community. The same principals that we are committed to in growing our business are shared by the Port in their efforts.

Fairhaven Group, Inc
300 Harris Avenue
Bellingham WA 98225
800 803 7225
360 733 5608
360 671 0495 fax
brentinfo@brenthaven.com

The Port has earned our trust and confidence and we fully support their recommendation for Alternative 6 as the preferred alternative It is a safe and effective approach for achieving Ecology's stringent cleanup objectives in a way that will add value to our local community.

36

I am not an engineer I am a businessperson. From my perspective, Alternative 6 makes the most financial sense It is expensive yet the investment will result in over 2 miles of restored shoreline, 28 acres of new aquatic land where GP's wastewater treatment lagoon now sits, and clean bottom sediments in the waterway.. This plan is economically feasible under the Port's strategic budget and is consistent with the Port and City's master planning effort to realize the community vision of a vibrant new waterfront with a mix of businesses, research, homes, expanded moorage facilities and waterfront trails connecting a spectacular series of parks and public access to the Bay

#12-K

If Alternative 6 is selected, I am confident our community and my business will benefit immensely. Bellingham will become the jewel of the Pacific Northwest-a beautiful and thriving community that we will proudly want to continue investing in.

Regards,

Harvey Stone
Owner

Brenthaven®

Commenter No. Name / Organization
19 Bright, Doug

Commenter Submittals:
A E-mail dated Nov 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

Bay Clean up

From: Doug Bright [dougbright542@msn.com]
Sent: Thursday, November 16, 2006 9:44 AM
To: lightsourceon@comcast.net
Cc: Derek@Sconnect.org; johnblethen@hotmail.com; waters@re-sources.org; chris@chritopherjwebb.com; McInerney, Lucy (ECY)
Subject: Bay Clean up

Dear sirs and ms,

11 16 06

I am sending this to you this morning because I think their is a better cheaper alternative for the bay clean up than those that have been offered so far. The option I am talking about involves extracting the contanimated mud from the Bay. Then through a series of freeze thaw processes drawing out the salt. That will allow the mud , now dry and without salt to be burnt in a cooking process develped and marketed by Dynamotive corporation. They have a working plant in Canada. This machine produces Char, Bio oil and methane.It is a self perpetuating process. The Bio oil can be burned in the present power plant on the georgia Pacific property. All of this can be put together much cheaper than the proposed capping in place or extracting and shipping to a secure land fill site. #12-K

Sincerely, Doug Bright Building Designer
9 Sudden Valley
Bellingham, WA 98229 4819

Ph 360 752 2300

PS I will be at the meeting tonight if you want to to talk with me.

| Commenter No. | Name / Organization |
|---|---|
| 20 | Britton, Tom |

Commenter Submittals:

A E-mail dated Dec. 15, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

**From:** Tom Britton [mailto:info@performance-yachts.com]
**Sent:** Friday, December 15, 2006 9:34 AM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway Cleanup

Dear Ms. McInerney,

As a Whatcom County resident, a boat owner, a fisherman, crabber, and boat broker, I am very familiar with the current waterfront plans. I have reviewed the draft RI/FS and EIS documents and am in support of the preferred alternatives 5 and 6 as they are currently documented. I appreciate the vast amount of time the Department of Ecology has spent studying this project and look forward to enjoying a safe and vibrant waterfront. Thank you for your efforts. #12-K

Sincerely,

Tom Britton
982 Chuckanut Drive
Bellingham, WA 98229

| Commenter No. | Name / Organization |
|---|---|
| 21 | Brock, Garry |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Dec. 16, 2006 | Garry & Sandra Brock |
| B | Letter dated Dec. 16, 2006 | Garry Brock |

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 2 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| 3 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 4 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

RECEIVED
DEC 18 2006
DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

**Sandra G. & Garry W. Brock**
**710 Sunset Pond Lane, #5**
**Bellingham, WA 98226**
**(360) 510-9845**

December 16, 2006

Ms. McInerney
Department of the Ecology

Re: Whatcom Waterway RI/FS/EIS Public Imput

Dear Ms. McInerney:

We are Whatcom County (Bellingham) residents that have used Bellingham Bay extensively for boating purposes for almost 40 years. In doing so we have had an opportunity to observe the boating community and it's impact on Whatcom County. From the non-boaters there seems to be the misconception that boaters don't positively impact the financial well-being of the community as a whole.

We can personally site one instance to disprove that theory. Last summer an out-of-state family, brought their boat to the Port of Bellingham. They liked Bellingham so well, that they then purchased a very expensive "summer" home here. They #12-K now pay taxes here in our community, spend a lot of money when they are here visiting and boating, and have a very positive financial impact on the community in general, while having very minimal impact on it environmentally. If it were not for the fact that they could moor their boat here, they would not have puchased the summer home … they would have purchased elsewhere, resulting in lost revenue to Whatcom County for years to come.

We have read the draft RI/FS and EIS documents for the Whatcom Waterway Site and support the preferred alternatives #5 and #6 as they are currently documented. 37
As boaters, we could not possibly support any plan that did not include a future marina facility when it so obviously benefits the entire community as a whole.

Thank you for your time and commitment to the future of our community.

Sincerely,

Garry W Brock Sandra Brock

Garry W. & Sandra G. Brock

Garry W. Brock
710 Sunset Pond Lane, #5
Bellingham, WA 98226
(360) 510-9845

38

RECEIVED
DEC 18 2006
DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

December 16, 2006

Ms. McInerney
Department of the Ecology

Re: Whatcom Waterway RI/FS/EIS Public Imput

Dear Ms. McInerney:

I am a Whatcom County (Bellingham) resident that has used Bellingham Bay extensively for boating purposes for almost 40 years, supporting the Port of Bellingham as a moorage customer as well as the local merchants.

Trying to get a permanent slip in the marina has been very difficult. There is a waiting list of several years for a slip. When Whatcom County residents are forced to moor their boats in Anacortes, La Conner, or elsewhere, they spend money in those communities, instead of in Whatcom County. That not only represents lost revenue to the community in general, both to the Port of Bellingham, and the local merchants, but also in the form of lost jobs for Whatcom County residents. The proposed marina would allow more Whatcom County residents to keep their boats here where they wanted them in the first place. 39

I have read the draft RI/FS and EIS documents for the Whatcom Waterway Site. I am in support of the preferred alternatives #5 and #6 as they are currently documented. As a boater, I could not possibly support any plan that did <u>not</u> include a future marina facility when it so obviously benefits the entire community as a whole. #12-L

Thank you for your time and commitment to the future of our community.

Sincerely,

Garry W. Brock

Garry W. Brock

Commenter No. | Name / Organization
---|---
22 | Brock, Sandra

Commenter Submittals:

A Letter dated Dec. 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| 2 | EIS | Marina comments | Support for development of new marina | 6.8 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

#1-A

Sandra G. Brock
710 Sunset Pond Lane, #5
Bellingham, WA 98226
(360) 510-9845

RECEIVED
DEC 18 2006
DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

December 16, 2006

Ms. McInerney
Department of the Ecology

Re: Whatcom Waterway RI/FS/EIS Public Imput

Dear Ms. McInerney:

I am a Whatcom County (Bellingham) resident that uses Bellingham Bay extensively for boating purposes. I have had a boat in the Marina (over the course of the past 35 years) for almost 10 years, thus supporting the Port of Bellingham as a moorage customer as well as the local marine merchants. For example, in the course of "rehabbing" a burned boat, and then a salvaged boat over the past four years, I, alone have spent hundreds of thousands of dollars right here in the marina. I share this with you only to demonstrate what impact the boating community has on the community as a whole. I am not rich, I don't have a "mega boat". I am industrious, and have found a way through "sweat eguity" to enjoy owning a boat that I otherwise would not be able to afford. It is my choice because I love being on the water. The fact that there are other boaters, still on waiting lists to get a slip, only proves that a future marina is needed and would definitely bring lots of revenue to our community.

I have read the draft RI/FS and EIS documents for the Whatcom Waterway Site. 1
I am in support of the preferred alternatives #5 and #6 as they are currently documented. In addition, I would like to add that I could not possibly support any
plan that did <u>not</u> include a future marina facility when it would so obviously 2
benefit the entire community as a whole.

Thank you for your time and commitment to the future of our community.

Sincerely,

Sandra Brock

Sandra G. Brock

**Sandra G. & Garry W. Brock**
**710 Sunset Pond Lane, #5**
**Bellingham, WA 98226**
**(360) 510-9845**

RECEIVED
DEC 18 2006
DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

December 16, 2006

Ms. McInerney
Department of the Ecology

Re: Whatcom Waterway RI/FS/EIS Public Imput

Dear Ms. McInerney:

We are Whatcom County (Bellingham) residents that have used Bellingham Bay extensively for boating purposes for almost 40 years. In doing so we have had an opportunity to observe the boating community and it's impact on Whatcom County. From the non-boaters there seems to be the misconception that boaters don't positively impact the financial well-being of the community as a whole.

We can personally site one instance to disprove that theory. Last summer an out-of-state family, brought their boat to the Port of Bellingham. They liked Bellingham so well, that they then purchased a very expensive "summer" home here. They now pay taxes here in our community, spend a lot of money when they are here visiting and boating, and have a very positive financial impact on the community in general, while having very minimal impact on it environmentally. If it were not for the fact that they could moor their boat here, they would not have puchased the summer home ... they would have purchased elsewhere, resulting in lost revenue to Whatcom County for years to come.

We have read the draft RI/FS and EIS documents for the Whatcom Waterway Site and support the preferred alternatives #5 and #6 as they are currently documented. As boaters, we could not possibly support any plan that did <u>not</u> include a future marina facility when it so obviously benefits the entire community as a whole.

Thank you for your time and commitment to the future of our community.

Sincerely,

Garry W Brock Sandra Brock

Garry W. & Sandra G. Brock

| Commenter No. | Name / Organization |
|---|---|
| 23 | Brunhaver, Kurt |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Nov 21, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General preferences | 5.1 & Table 5-2 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

**From:** Kurt Brunhaver [kurtbrunhaver@qwest.net]
**Sent:** Tuesday, November 21, 2006 2:08 PM
**To:** McInerney, Lucy (ECY)
**Cc:** info@bbayf.org
**Subject:** Bellingham bay clean up

I live in Bellingham. My kids live in Bellingham. This whole cleanup debate seems so simple to me. If we remove the mercury/pollutants, we minimize our future risk of exposure to this less than friendly toxin. We do not limit our options for the future and what seems so obvious is it will NEVER be cheaper to get rid of the mercury and other pollutants right now than in the future. The long-term benefits are so much better than the short term costs.

I and my family want a cleanup plan that removes ALL the mercury and associated toxins. I DO NOT want to cap them in place. That would be a huge risk! 1

Thank you for reading my note. I truly hope you will consider my comments. This is VERY important to me.
Sincerely,
Kurt Brunhaver
Bellingham, WA.

Commenter No. | Name / Organization
--- | ---
24 | Carlburg, Doug

Commenter Submittals:

A Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Doug Carlburg**
My name is Doug Carlburg. I live here in Fairhaven. I don't come to many of these meetings; they are hard to make it too. This stuff is tough to get your mind around especially if you don't come to too many of them. It's impressive to see this many local people who have stopped and taken the time to get their minds around this science without the training and the dedication they put in. Looks to me like the most significant evidence that you have in your hands today about the public of Bellingham are the surveys and the signatures that were gathered

I think this decision belongs to us today. 500 years from now there will still be people here, hopefully. They'll look back at our judgment. The extra money to clean up the mercury, correctly, is insignificant over a 500 year period. A good cost-analysis takes a look at how much you spent and how long what you spent the money on gets done.

If you buy something that lasts ten years, it costs more money but it might be less money over the long run.

But I don't think 500 years from now people want to be continually worried about a band-aid problem.

It's a unique opportunity with Georgia Pacific shutting down, that opportunity comes only about once every 100 years and it's our decision now.

I don't think this whole idea of if I can use an analogy if you have poisons in your home it doesn't matter whether they were there when you got there or you put them there you don't let children only have 5 ounces of it and say that' s enough, your tolerance level is fine. You don't put a rug over it. You do the responsible thing. I think not cleaning this up will be looked at 100, 200 years from now as irresponsible on our part. It's sad to say the Port of Bellingham is one of the major impediments to having this happen. The Port of Bellingham has done a lot of great things but on this is issue I think they are dead wrong.

I think that their desire to have a yacht harbor, which 30 years from now I don't think they'll be rich enough to own a yacht, but we've got poisons on one hand ,we've got a yacht harbor on the other and that's the politics. It's fortuitous to have a poisonous dump that needs to be removed directly adjacent to a pond that is designed to hold pollution. It doesn't get much simpler than that, put it in the pond. Don't send it to somebody else to take care of our poisons. Like I said, if you buy a house with poisons in it, clean it up. Don't blame the guy before you, just get in there and clean in up but don't send it to Wenatchee and tell them they have got to clean it up otherwise they will be sending their crap here. That's my comments. 1

Commenter No. | Name / Organization
---|---
25 | Carper, Floyd

Commenter Submittals:

A Public hearing transcript excerpt

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Floyd Carper**
The main thing I have to say I've only lived here about 6 years or a little better in the Bellingham area. I lived in the Everett area for over 30 years and I know that during all this time they had problems down at Everett with hard metals and stuff and a lot of times we were advised not to fish because of it and they'd try to done a number of different things like I know they had problems down in the San Francisco area trying to cover up stuff and it has not worked like most people think it should. That's it, thank you. 1

| Commenter No. | Name / Organization |
|---|---|
| 26 | Carter, Laura |

Commenter Submittals:

| | |
|---|---|
| A | Letter dated Oct 31, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

October 31, 2006

RE: Prefer Alternative #5

After review of the Whatcom Waterway Site background, and the summary of clean up alternatives - their impacts, benefits and mitigation, I prefer Alternative #5. The recommendation balances cost with
benefits; provides a responsible method of caring for the 1
environment; and it permits a reasonable restoration time frame, which benefits the community as a whole. In addition, Alternative #5 meets two important criteria - financial and environmental stewardship.

Laura Carter

Laura Carter
1544 Toledo Court
Bellingham, WA 98229

Commenter No. | Name / Organization
---|---
27 | Charlton, Fred and Kirsti

Commenter Submittals:

A E-mail dated Nov. 26, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General preferences | 5.1 & Table 5-2 |
| 2 | RI | Seafood quality | Desire for safety of seafood from Bay | 4.4 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Kirsti Charlton [kirsticharlton@gmail.com]
**Sent:** Sunday, November 26, 2006 12:52 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham Bay Clean-up

Lucille T. McInerney, P.E. Site Manager
Washington State Department of Ecology
Northwest Regional Office
3190 160 th Avenue
Bellevue, WA 98008-5452

Dear Ms.McInerney :

I am contacting you via email because of our concerns for the future environmental health and safety of Bellingham Bay and present and future residents and visitors to Bellingham and Washington State.

Yes, I'm referring to the mercury deposits in the relatively shallow waters of Bellingham Bay. I think this is a project that requires total clean-up, not just a cover-up (capping). Bellingham Bay should be as free of toxins as possible. Our residents and visitors should be able to eat seafood from the Bay without environmental and health concerns and cautions. Our grandchildren should be able to say, "they did the right thing."

1

2

I am aware that the "right" thing is expensive, that dredging the mercury and removing it from the sea bed still has certain risks of contamination. However, from our standpoint, now is the time to to spend the money to remove, not cover up, as much of the mercury as possible, for an environmental future that will have fewer, later risks of contamination. I t's regrettable that nearly 40 years ago, when I moved to Bellingham, that we, as a scientific and residential community, did not realize, or accept, the kind of health and environmental risks being created. Our knowledge and concern is so much greater now. Let's make the Bay as clean as possible, for as many uses as possible, with the lowest amount of risk, now and in the future. Let's clean, not cap.

Thank you for considering this input.

Sincerely,

Fred and Kirsti Charlton
1410 Grant St.
Bellingham WA 98225

tel: 360-671-0708

Commenter No. 28 — Name / Organization: Citron, Todd

Commenter Submittals:

A — E-mail dated Dec 18, 2006

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Capping costs | Monitoring costs | 5.11 |
| 3 | FS | Capping costs | Contingent remedies & repairs | 5.12 |
| 4 | RI | Mercury concerns | General concerns about mercury toxicity | 4.1 |
| 5 | RI | Methylmercury | Concerns about methylmercury formation | 4.8 |
| 6 | RI | Cleanup levels | Application of SQS, MCUL and BSL | 4.2 |
| 7 | RI | BSL Basis | Seafood consumption rates | 4.3 |
| 8 | RI | Cleanup levels | Cleanup levels and subsurface sediments | 4.2 |
| 9 | FS | Prop Wash & Nav. Disturbances | Potential disturbances to Inner Waterway | 5.4 |
| 10 | FS | Residuals and water quality | Favors enclosed excavation of Inner Waterway | 5.16 |
| 11 | FS | Capping design | Capping in steeply sloping areas | 5.8 |
| 12 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |
| 13 | EIS | Navigation channel | Support for multi-purpose channel | 6.7 |
| 14 | FS | Additional habitat | Support for habitat backfill in Inner Waterway | 5.22 & 6.10 |
| 15 | FS | Additional habitat | Support for replacement of ASB with habitat | 5.22 & 6.9 |
| 16 | FS | Capping costs | Costs of cap monitoring | 5.11 |
| 17 | FS | Capping costs | Costs of repairs & contingent remedies | 5.12 |
| 18 | FS | Remedy preferences | Specific preferences | 5.1 & Table 5-1 |

**Notes:**

EIS — Supplemental Environmental Impact Statement
FS — Feasibility Study (Volume 2 of Supplemental RI/FS)
RI — Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS — Responsiveness Summary (Narrative)

#1-A

**From:** Mail2 [mailto:Mail2@zoodle.com]
**Sent:** Monday, December 18, 2006 3:15 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Citron: Port of Bellingham / Georgia Pacific - Whatcom Waterway cleanup - Public Comment.

To: Washington State Department of Ecology: Lucille T. McInerney - lpeb461@ecy.wa.gov – via eMail
From: Todd Citron: 4700 Lakeway Drive, Bellingham, WA 98229, 360-715-3453, mail2@zoodle.com
Re: Port of Bellingham / Georgia Pacific – Whatcom Waterway cleanup – Public Comment.

December 18, 2006

To Whom It May Concern:

Please cleanup the mess left by Georgia Pacific to the highest degree possible in order to assure for the future the most beneficial economic and aesthetic choices, and with the least degree of wildlife and human health risk. 1

I am in favor of your alternative 7. It would meet the widest possible long-term needs of the site, so many 2
of which are not yet determined. It would require the least ongoing (forever for alternatives) funding for monitoring. It would require the least ongoing (forever for alternatives) funding for maintenance and repairs (eg., to a capped solution). 1

Department of Ecology's preferred alternative 6 does not not sufficiently clean up the mercury in Bellingham Bay.

* Mercury is toxic and the cleanup must be as permanent and as protective as possible:

1) Mercury is a persistent bioaccumulative neurotoxin; it does not degrade, but builds up in animals and humans, with the greatest amount of build up at the highest levels of the food chain. 2

2) The most toxic form of mercury, methylmercury, commonly builds up in fish and presents a health risk to animals and humans that eat fish. An even greater risk is posed to developing babies, exposed to mercury, through the placenta and mother's milk.

3) Methylmercury adversely affects brain development at very low levels, resulting in decreased IQ, memory, language, and fine motor abilities in people, and in foraging and nesting behaviors in fish and birds.

3

4) Methylmercury formation is very difficult to predict. For this reason, removal of mercury in the environment is one of the best ways to safeguard against the formation of methylmercury.

5) Mercury removal is regulated at the Minimum Cleanup Level (0.59 parts per million in sediment), but the override of this level by biological tests has been allowed, even though biological tests are not #4-B
adequate to assess the potential for harmful neurological effects in higher animals.

6) The Biological Screening Level (1.2 parts per million in sediment) is another cleanup level calculated to protect subsistence fishers, but it uses an underestimate for the consumption rate of seafood (70 grams/ day vs. 270 grams/day) and so is not protective for people who eat significant amounts of seafood from the area. 4

* Mercury at high concentrations will be left in the waterway under Ecology's preferred alternative 6:

1) Ecology's preferred alternative relies on a strategy where the removal of mercury contamination would occur in areas that are currently the least problematic; at GP's treatment lagoon which is currently enclosed and the Outer Whatcom Waterway where contamination is generally light. The Inner Whatcom Waterway would be capped.

2) Mercury levels in the Inner Whatcom Waterway will be as much as 20 times the clean up level; 4
mercury in the Inner Waterway would be dredged only under a scenario which calls for industrial use of
the Waterway

3) Mercury levels in the Log Pond are 254 times the clean up level and the log pond will not be dredged under any of the cleanup alternatives.

* RI / FS cleanup strategies were not adequately evaluated:

1) High concentrations of mercury (up to 12 parts per million) are most vulnerable to disruption in the 5
Inner Whatcom Waterway, and so removal of mercury in this area should be prioritized, but it was not.

2) The RI / FS did not adequately evaluate dredging techniques in the Inner Whatcom Waterway that 6
would minimize short term risk, such as the placement of sheet pile walls to contain any sediment
disturbed by dredging.

3) The RI / FS did not adequately evaluate the difficulty of capping around pilings and on steep edges, #5-A
even though failure of the log pond cap stemmed from inadequate capping around its edges and pilings.

4) The RI / FS evaluated 8 limited alternatives and did not evaluate two key options for removing 3
contamination and restoring habitat, such as a full dredge of the Whatcom Waterway coupled with non-
industrial use, and a full dredge of the lagoon coupled with its complete return to habitat.

4

5) The disproportionate cost analysis which was used to determine the preferred alternative used
subjective evaluations and did not realistically account for costs associated with monitoring or
maintenance of a cap.

2

Department of Ecology's preferred alternative 6 does not not sufficiently clean up the mercury in
Bellingham Bay. It would be more expensive to implement alternative 7; however, the broadening of
choices of development that would be safer over the unknown future, the ongoing costs in repair and 1
monitoring, plus the costs related to potential health issues for wildlife and humans from undetected
problems over hundreds of years outweigh that increased cost.

13

For your approach to the Whatcom Waterway cleanup, please require the parties involved to implement alternative 7.

14

Thank you,

Todd Citron 15

4700 Lakeway Drive, Bellingham, WA 98229
360-715-3453
mail2@zoodle.com

Commenter No. | Name / Organization
29 | City of Bellingham

Commenter Submittals:

A	Letter dated Dec. 1, 2006	Tim Douglas (Mayor)

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | EIS | Land use changes | Support for waterfront revitalization | 6.6 |
| 2 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 3 | EIS | Pilot goals | EIS evaluation using Pilot goals | 6.12 |
| 4 | FS | Log Pond | Support for implementation of cap upgrades | 5.14 |
| 5 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS	Supplemental Environmental Impact Statement
FS	Feasibility Study (Volume 2 of Supplemental RI/FS)
RI	Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS	Responsiveness Summary (Narrative)

#1-A

OFFICE OF THE MAYOR
210 Lottie Street, Bellingham, WA 98225
Telephone: (360) 676-6979 Fax: (360) 738-7418

RECEIVED
DEC - 5 2006
Port of Bellingham

December 1, 2006

Lucille McInerney
Site Manager
WA Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Re: Whatcom Waterway site cleanup

Dear Ms. McInerney:

On behalf of the City of Bellingham, I am writing with regard to the recently released Remedial Investigation/Feasibility Study (RI/FS) and Environmental Impact Statement (EIS) related to the Whatcom Waterway.

The City of Bellingham has already committed support through an interlocal agreement with the Port of Bellingham to the Port's preferred cleanup plan. We would like to reiterate that support to the Department of Ecology, and offer a few additional comments with regard to the documents that have been released to the public.

The community's vision for the waterfront is dependent on a cleanup plan that will support all 1
that we hope to accomplish on the waterfront. New habitat, public access, a mix of uses, deep
water shipping, jobs and residences are all part of that vision. Cleanup Alternatives 5 and 6
support that vision by protecting the health of humans and the environment and effectively 2
mitigating the impacts of the long-time use of this area for heavy industry within a realistic time
frame and cost. The City appreciated that in addition to the applicable regulatory criteria, the
eight alternatives were rated against the long-standing goals of the Bellingham Bay Pilot 1
Program.

The proposed dredging and hard-capping of the log pond shoulder area is essential to ensure
long-term protection of the log pond cleanup and habitat restoration. The erosion that has 2
occurred thus far indicates the current cap is insufficient, and the City supports a cleanup plan
that addresses that issue. Also, adequate deep dredging the shipping terminal is essential to
ensuring that resource for future economic development opportunities. Alternative 6 is the best 3
option to address these two needs.

Accomplishing a safe and effective cleanup within a reasonable time period at a fundable cost is a remarkable feat. Alternative 6 is the recommended alternative of the City of Bellingham as the cleanup action plan for the Whatcom Waterway site.

Sincerely,

Tim Douglas
Mayor, City of Bellingham

COPY

Commenter No. Name / Organization
30 Clasby, Deanna

Commenter Submittals:
A E-mail dated Dec. 18, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: DEANNA h [mailto:zoomzonk@hotmail.com]
Sent: Monday, December 18, 2006 6:18 PM
To: McInerney, Lucy (ECY)
Subject: bellingham bay clean up

To whom it may concern

As a resident of this town I value living in a non-toxic enviroment.
The mercury (and other toxins) in Bellingham Bay must be cleaned up.
The mercury needs to be dealt with in a way that wont let it escape
back
into the marine environment .
Our water´is valuable.
I want the toxins cleanup up, hauled away and disposed of properly. 1

Thank you
Deanna Clasby
2110 I Street
Belingham WA 98225

Commenter No. Name / Organization
31 Clossey, Debra

Commenter Submittals:
A Letter dated Nov. 23, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 3 | EIS | Land use changes | Support for land use changes | 6.6 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

November 23, 2006

Lucille T. McInerney, P.E
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Dear Ms. McInerney :

I am writing to express my thoughts on the clean-up of the Whatcom Waterway Site in Bellingham, Washington as a part of the public comment period.

In summary I would like it known that I am in support of Alternative #6 as the preferred mechanism for cleaning the site and preparing it for redevelopment. I have reviewed the materials provided to the public by the Department of Ecology and it is clear to me that Alternative #6 provides the correct and necessary balance between cost, clean up standards and potential future reuse. I also am satisfied that the planned development of a marina in the old GP basin is the best public use. 1 2

Information provided by Ecology, the Port and other interest groups seems to me to prove that Alternative #6 is the preferred solution. From those materials I note that Alternative #6 has received a High overall MTCA ranking, meets all MTCA threshold criteria, and its restoration time frame is amongst the lowest of the eight alternatives being reviewed. Furthermore, MTCA ranks the overall benefits of Alternative #6 as High, it finds the costs of the clean-up to be proportionate to the benefit, and concludes that the alternative is permanent to the maximum extent practicable.

I am excited about the potential of this important redevelopment project, which will open a large share of the Bellingham waterfront to public use. I believe that alternative #6 will provide our community with the best and most cost effective opportunity too complete the reopening of the waterfront area. 1

Sincerely,

Debra L. Clossey
1009 Lone Tree Court
Bellingham, WA 98229

Commenter No. Name / Organization
32 Clossey, Timothy

Commenter Submittals:
A Letter dated Nov. 23, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 3 | EIS | Land use changes | Support for land use changes | 6.6 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

November 23, 2006

Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Dear Ms McInerney :

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In summary I would like it known that I am in support of Alternative #6 as the preferred mechanism for cleaning the site and preparing it for redevelopment. I have reviewed the materials provided to the public by the Department of Ecology and it is clear to me that Alternative #6 provides the correct and necessary balance between cost, clean up standards and potential future reuse. I also am satisfied that the planned development of a marina in the old GP basin is the best public use. 1 2

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I am excited about the potential of this important redevelopment project, which will open a large share of the Bellingham waterfront to public use. I believe that alternative #6 will provide our community with the best and most cost effective opportunity too complete the reopening of the waterfront area. 1

Sincerely,

Timothy J. Clossey
1009 Lone Tree Court
Bellingham, WA 98229

| Commenter No. | Name / Organization |
|---|---|
| 33 | Cool, Seth |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 18, 2006 |
| B | Public hearing transcript excerpt |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Capping concerns | General concerns over capping effectiveness | 5.2 |
| 3 | FS | Capping costs | Costs of cap monitoring | 5.11 |
| 4 | FS | Capping costs | Repair & contingent remedy costs | 5.12 |
| 5 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

**From:** Seth Cool [mailto:sethfcool@yahoo.com]
**Sent:** Monday, December 18, 2006 3:43 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Comments regarding the RI/FS Whatcom Waterway, Bellingham

December 18, 2006

Lucille T. McInerney
Site Manager
Department of Ecology
Northwest Regional Office
3190 160th Avenue
Bellevue, WA 98008-5452

Re: Comments regarding the RI/FS Whatcom Waterway, Bellingham

Dear Department of Ecology,

Thank you for accepting comments regarding the Remedial Investigation and Feasibility Study.

I am a homeowner in Bellingham and I work in the downtown area. I oppose the Preferred Alternative (Alternative 6). Instead, I believe the mercury and other toxic sediments in Bellingham Bay should be removed and disposed of properly. 1

While dredging the toxins may increase short term exposure risk, the risk of leaving mercury and other toxins in place for the long term is unacceptable to me. It is not clear the toxins are stable in their current location, nor is it clear that a cap will be protective. 2 It is also difficult to predict what physical or chemical changes may take place over the long term which may disturb the cap or render it ineffective. Removing the toxins now will ensure that we have far more options in the future with regard to the maritime use of the waterway and land use on its banks. I feel the best solution is to remove as many of the toxins as possible from the Whatcom Waterway and to dispose of them properly.

One example of a change that could take place is captured by what is occurring in San Francisco Bay where the recently introduced Asian clam is concentrating historically deposited selenium and other heavy metals. The clams are eaten by surf scoters, and scientists are now theorizing that selenium intake is one reason for the decline in the surf scoter population. It is very difficult to predict what impacts invasive species might have and how these introduced species might change the marine environment. Such unknowns make capping a less attractive option.

The Preferred Alternative also seems to have low estimate of monitoring. Why is this 1
estimate so low? Are potential catastrophic events or impacts from invasive species included in this estimate? Where would additional funds come from if toxic sediments 2
become exposed or leach out?

Of the eight alternatives offered, it appears that only two meet the proposed land-use criteria, yet these both include capping mercury in place. Why are there no alternatives which both meet the proposed land use criteria and prioritize mercury removal?

The marine environment is dynamic, and mercury is highly toxic. To not clean up Bellingham Bay right the first time would be to leave this problem for future generations. I believe the best way to clean up Bellingham Bay is to remove the mercury contamination and dispose of the spoils in a secure upland area.

Thank you for the opportunity to comment.

Seth Cool
711 Gladstone Street
Bellingham, WA 98225
sethfcool@yahoo.com

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Seth Cool**
Seth Cool, 711 Gladstone Street. I'm just here to voice my support for removing the mercury from Bellingham Bay. I don't think capping it is a good idea. I think it should be completely removed. It's really important that we do it right the first time, that this problem isn't left to fester, isn't left for future generations or my generation for that matter to go through this process all over again and pull the mercury out of Bellingham Bay as I believe needs to be done. #4-B

So please get rid of it. Thank you.

| Commenter No. | Name / Organization |
|---|---|
| 34 | Coons, Joseph |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 14, 2006 |

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 2 | FS | Residuals and water quality | Recontamination during dredging | 5.16 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

**From:** Joe & Judy Coons [mailto:joejudyc@comcast.net]
**Sent:** Thursday, December 14, 2006 5:49 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Port of Bellingham Cleanup Proposals

Dear Ms. McInerney:

I am a frequent user of the Port of Bellingham as a recreational boater, but I am also a retired senior who works part-time in the Port training boat operators for three of the five charter companies here. I have been watching the Port's planning process, and have attended a number of meetings.

1) I have noted the changing attitudes of boaters regarding pollution. Whether from Whatcom County or elsewhere, operators are truly anxious to "do the right thing" for the environment, and they care for our waters and waterways.

2) As a professional leader of groups of boaters on cruises from Olympia to Skagway, I 1
have noted some excellent examples of marinas that have *contributed* to the aquatic environment for fish nurturing such as the remarkable Elliott Bay Marina, which has had positive economic as well as ecological impacts.

The alternative plans # 5 and #6 favored by the Port and City of Bellingham, and your Department seem to be the best set of options! While capping the mercury deposits following the latest proven technology, they also offer the greatest economic opportunity to our City! By allowing our extremely popular marina to expand, they will return their cost in a reasonable time, with much of the repayment coming directly from boat owners, the users.
In addition, by disturbing the bottom the least compared to total removal, they quite 2
possibly will actually pollute our waters less than the more expensive alternatives.

But the reality is, I am just a layman. I am confident that the experts at your department and at the Port and the City, as well as your consultants, know what's best! I
urge you to go forward with Alternative 5 or 6, as your department, the City and the Port 1
have recommended.

Thank you for your attention,

Joseph D Coons
25 Shorewood Drive
Bellingham WA 98225

Commenter No. 35
Name / Organization: Counoyer, Kevin

Commenter Submittals:

A Letter dated Dec. 18, 2006
B Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | (RS Section) |
| 1 | EIS | Marina comments | Opposition to development of new marina | 6.8 |
| 2 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 3 | EIS | Property ownership | Ownership of former GP property | 6.3 |
| 4 | RI | ASB Status | Applicability of cleanup levels to ASB | 4.12 |
| 5 | RI | ASB Status | Applicability of cleanup levels to ASB | 4.12 |
| 6 | RI | Cleanup levels | Cleanup levels and subsurface sediments | 4.2 |
| 7 | RI | ASB Status | Applicability of cleanup levels to ASB | 4.12 |
| 8 | RI | Relative contaminant levels | Expression of relative contaminant levels | 4.11 |
| 9 | FS | Institutional controls | Need for institutional controls for filled ASB | 5.28 |
| 10 | FS | ASB comments | Repair of ASB liner under Alt. #3 | 5.20 |
| 11 | FS | Additional habitat | Backfill for habitat in Inner Waterway | 5.22 & 6.10 |
| 12 | FS | Project funding | Grant funding and Waterway dredging | 5.26 |
| 13 | FS | Additional habitat | Backfill for habitat in Inner Waterway | 5.22 & 6.10 |
| 14 | FS | Cap design | Use of clean sediments for capping | 5.8 |
| 15 | FS | Cost accuracy | Volumes of contaminated sediment | 5.26 |
| 16 | FS | Disproportionate cost analysis | Discussion of public concerns | 5.25 |
| 17 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 18 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 19 | EIS | Alternative ASB Uses | Favors upland residential reuse | 6.9 |
| 20 | EIS | Marina comments | Opposition to development of new marina | 6.8 |
| 21 | RI | BSL Basis | Seafood consumption rates | 4.3 |
| 22 | FS | Source control | Stormwater and recontamination potential | 4.9 & 5.29 |
| 23 | FS | Source control | Chlor-alkali source control concerns | 4.9 & 5.29 |
| 24 | FS | Source control | Timing of cleanup action | 4.9 & 5.29 |
| 25 | EIS | SEPA Official | Identity of SEPA official for SEIS | 6.2 |
| 26 | EIS | Land ownership | Ownership of former GP property | 6.3 |
| 27 | RI | ASB Status | Applicability of cleanup levels to ASB | 4.12 |
| 28 | RI | ASB Status | Applicability of cleanup levels to ASB | 4.12 |
| 29 | RI | Contaminant distribution | Vertical distribution in Whatcom Waterway | 4.5 |
| 30 | EIS | SEPA Official | Identity of SEPA official for SEIS | 6.2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

18 December 2006

Kevin Cournoyer
2514 West Street
Bellingham, WA 98225
kjc@mac.com
360.527.1097

Lucille T. McInerney
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Dear Ms. McInerney:

I'm grateful to you and the State of Washington for providing oversight of cleanup projects that directly effect the health and safety of current and future generations of citizens. I've observed some of your work in the past and have been generally pleased. But your oversight of the Port of Bellingham's Whatcom Waterway cleanup plan greatly concerns me. I'm concerned that the trust the people of Whatcom County have placed in the State's environmental oversight responsibility may have been severely violated by the October 2006 Whatcom Waterway Remedial Investigation/Feasibility Study (RI/FS) and Environmental Impact Statement (EIS). I remain hopeful that you, in the fullness of time, will act in such a way that the trust of citizens can be regained.

**Purpose**

Briefly, I'd like to call attention to recent comments made to KGMI Radio by an official from Ecology. This official said that, in essence, the public is not here to pick the "best" cleanup alternative. The implication, I suppose, is that Ecology has already done that, as is stated on 1-1 of the FS. This official further indicated that the public is here to, in essence, check Ecology's homework. Respectfully, I must say that I'm unaware of any regulations that would, in any way, limit the scope of public concerns or how Ecology responds to them. In fact, there are precedents to the contrary. I think it's important to emphasize that there are 8 alternatives in the RI/FS. And 4 of them cap the ASB. If Ecology did not want us to consider any but the two "preferred alternatives," it should not have put the other alternatives in the documents. I hope those other alternatives were not put in there simply to humor us or to make the Port's intentions seem fair-minded or objective. Because they're not—fair-minded or objective.

**Criticisms**

There are a lot of problems with this RI/FS and EIS. I'd like to organize most of my comments around a few general definitions that appear deliberately mangled in these byzantine documents.

**1. Landowner.** I met Mike Stoner, the Port's Director of Environmental Programs and
SEPA lead for this project, for the first time on January 24th of this year at a LMN pres-
entation of design concepts for New Whatcom. And, not surprisingly, we had an argu-
ment. I had been to many meetings about the waterfront. I had been to the charate for
New Whatcom. And I had been listening very carefully to public comments. Other than a 1
braying minority (this has been substantiated by polling data
[http://www.bbayf.org/polls/index.html]), it was clear that the majority of citizens had no
interest in a marina in the ASB. I had studied Alternative J or the Modified Preferred Al-
ternative. It was obvious that for the sake of public health and safety, you had to use the 2
ASB to help remediate the inner Waterway in a cost-effective manner. The ASB's right
there, after all, right next to the Waterway. It only makes sense. It would be irresponsi-
ble to not use it for remediation. So I spoke up at the first LMN presentation about this
problem. Why in the hell did not one design concept exclude a marina? As David Brick-
lin later proved in March
(http://www.bbayf.org/images/documents/marina_legal_question.pdf), there is no legal
obligation for including a marina in the ASB. What's going on? The public was and is
clearly on board with exploring other ideas for that area. Not the Port, though. Clearly.

After I finished speaking, Mr. Stoner turned to me. We had an exchange that went
something like this:

MS: The marina is why this all started.
KC: That's irrelevant at this point. The Port doesn't own this property. The public owns
the property.
MS: The Port owns the property. 1
KC: No, the Port *manages* the property. The public *owns* it.
MS: The Port owns it.
KC: The public owns it.
MS: The Port owns it.

You get the idea. Let me quote from the Port of Bellingham's Mission Statement:

"The Port pledges to work cooperatively with other entities — within the framework of community standards — and to be a responsible trustee of our ***publicly owned assets."*** [Emphasis mine.]

So when we you talk about the "wishes of the landowner," the plain truth of the matter is that we're talking about the wishes of the public. Not the Port. The ***public***. The POB is not a private corporation. In two polls, the ***public*** rated the safe disposal of contaminants highest among a list of concerns about our waterfront redevelopment. The ***public*** spoke clearly and unequivocally about the cleanup of the Whatcom Waterway by signing the Healthy Bay Initiative. 6400 signatures. 6400 voices. I implore the Department of Ecology to do what neither the City nor the Port has done: listen to them.

**2. Aquatic vs. Upland.** For years both City officials and Port officials have explicitly and
implicitly defined the ASB as aquatic land. It's not. But they've tried mightily to convince 2
the public that it is. Frank Chmelik, the Port's lawyer, has even made this assertion in

legal papers—in the lawsuit against People for a Healthy Bay. He said, basically, that Mark Asmundson wrote a letter and *that* makes the ASB aquatic. This is laughable and possibly perjurous. The argument that Mr. Asmundson has the authority to define the status of the ASB with a letter is about as compelling as his ability to chose a City logo. [Long story.] More troubling, this false assumption—that the ASB is aquatic—is laced throughout the Port's RI/FS and EIS and stated pretty explicitly on page 6-21 of the FS. 2

On March 16th of this year, an official with Ecology spoke before the Bellingham City Planning Commission. He said the following:

**"Under the Shoreline Act, we consider the ASB filled, even though it's a lagoon. It's a wastewater treatment plant, much like a sewage treatment plant. <u>It's not a water body of the State.</u> <u>It's uplands.</u>"**
**[http://www.bbayf.org/public/public_08.html]**

The next day, the Port attempted to get this Ecology official in serious trouble— for speaking the truth. Even the Governor, Chris Gregoire, was dragged into this nonsense. If you don't believe me, ask her. These statements from an Ecology official clearly alarmed the Port of Bellingham.

There has not been anything whatsoever (no permits, no germane revisions to the Shoreline Act or anything else) that has changed the *status* of the ASB. The incontrovertible truth is that it is an upland area. Wishing it otherwise, at this point, will not make it so.

Why has this false definition been *so* important to the Port and the City? Now that the public has had an opportunity to study the Port's WW RI/FS and EIS, we know why. 3

First, it's important to understand that the chemical SQS for mercury in sediments is 0.41 mg/kg in an aquatic environment. The MCUL is different, but close. (The RI/FS would argue that these cleanup levels do not apply below 12 centimeters [less than 5 inches] or the so-called "bio-active" zone. I think that's a dangerous approach. I'll return to that concern later when I discuss dredging depths. Really, you should be thinking about a few feet, not a few inches, and it should be tied to the actual depths of the contaminants themselves.) Here's the thing: The cleanup levels for mercury in an **upland setting for unrestricted use is 24 mg/kg**. What are the average mercury levels in the ASB, regardless of depth? **6 mg/kg**. That clears MTCA "B" levels easily. The ASB, as far as bioaccumulative toxins like mercury are concerned, can be considered "clean" for an upland area. #4-B

What does this mean for this RI/FS? It means that all of the unfavorable comparisons between the inner Waterway and the ASB regarding mercury levels—and there are, mind you, a lot of them—are completely erroneous. Disingenuous at best. Over and over again, the Port tries to convey the impression that the ASB has extremely high levels of mercury. Since the ASB is an upland area, this is flat wrong. It has lots of phenolic compounds, but those compounds break down over time. (The so-called methane problem mentioned in the FS has not been substantiated in any engineering report. [Mr. 4

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Stoner has been indulging in this speculation since at least his May '04 letter to Ecology. If he can't prove it and is unwilling to study it in a RI, he should stop using it. Like so much of the writing in the RI/FS, this is just another vague, unproven, biased speculation to further a narrow objective—a marina in the ASB.) And, again, the mercury levels? Absolutely trivial for an upland setting. Trivial. In this regard, contrary to what we've heard from the Port, the City, *The Bellingham Herald,* and the 2006 WW RI/FS and EIS, the ASB is one of the "cleanest" sites on our waterfront. And if the mercury in the inner waterway (an aquatic environment) were placed in the ASB (an upland environment), the mercury levels would continue to be regarded as low in the ASB. All the sediments, for example, in the entire Alt. J dredge prism are far below 24 mg/kg. After filling the ASB, you would possibly not even need deed restrictions or restrictive convenants. From page 34 of the 2002 RI/FS for the Whatcom Waterway site:

**"Under MTCA, in those situations where hazardous substances remain on-site at concentrations above applicable cleanup levels, institutional controls such as deed restrictions or restrictive covenants may be required to protect the integrity of the remedial action and prevent exposure to contaminants remaining at the site. However, based on data collected during the RI/FS (Anchor and Hart Crowser 2000), sediment concentrations within WW Area Alternative J dredge prism (Figure 12) are below prospective Method B MTCA soil cleanup levels for unrestricted land uses, particularly if water quality is already addressed (see above). For example, the MTCA Method B (unrestricted land use) cleanup level for mercury in soil to protect from potential soil contact exposures is 18 mg/kg (Ecology 2001), while the maximum sediment mercury concentration within the Alternative J dredge prism is 12 mg/kg. Thus, MTCA restrictive covenants (WAC 170-340-440(4)(a)) may not be applicable to the ASB CDF."** 5

This is serendipitous and extraordinary. You should definitely use the ASB somehow for the benefit of the Waterway. Again, it would be irresponsible not to. Clearly, the Port's RI/FS and EIS for the Whatcom Waterway, from the perspective of human health and safety, focuses on the wrong problems.

**3. CDF vs. CND.** For years, the ASB has been defined as a CDF—a Confined Disposal Facility. That's what it was in the 2002 Modified Preferred Alternative or Alt. J. In how it's engineered, it's actually similar to other CDFs on the West coast. CDFs rank favorably, according to MTCA, with regard to the disposal of contaminants. CNDs (Confined Nearshore Disposal sites)? Not so much. It's obvious that this definition—this pesky CDF thing, if you will—would cause problems for the Port of Bellingham in any fair ranking of the various alternatives. So, with the willful complicity of the Department of Ecology, they changed the disposal designation of the ASB from a CDF to a CND. The explanation for this change is not, as far I can determine, in the narrative of the RI/FS. (There's not much more than one *passing* reference to it in the EIS [e.g., pp. 4-24–4-25], but it's couched in the usual speculative language of these documents ["...may require...."] and it's not supported with any hard evidence—no referenced documents or reports whatsoever.) If pressed, I'm told that Ecology will unearth a report that speculates that the removal of sludges and the aerating fans (the weirs) and berm construction might damage the bentonite liner and, thus, degrade the disposal ranking of the 6

ASB. Is this report tenable? Maybe. Has it be substantiated empirically? No. It might be right. It might be wrong. (I have not personally seen this report. There's absolutely no direct reference to this report, as far as I can determine, in the RI/FS or EIS.) But it's hardly a compelling case to reclassify the disposal designation of the ASB. If the bentonite were damaged, you can replace it—simply reline the ASB. And there are other possibilities, which would require further investigation. (There are scenarios wherein you do not have to construct a berm, for example.) All of this is spelled out in the Healthy Bay Principles created by Frances Badgett and Greg Glass for the Bellingham Bay Foundation. They provide you with numerous rational scenarios wherein you could use the ASB for the purposes of remediating the Whatcom Waterway; in other words, for remediating a highly vulnerable aquatic environment by using a confined, engineered upland environment, the ASB. No matter how inconvenient this fact might be for the Port, for all intents and purposes, the ASB is still a Confined Disposal Facility (CDF). Whether it remains that way permanently or temporarily will require further investigation and study. Next time I request that the authors of the RI/FS be honest about the ASB. A wide array of real alternatives should be brought before the public—before the real owners of this property—for review and comment.

**4. Dredging Depth.** All the alternatives that dredge the inner waterway do so for the purposes of achieving federal depth and most of them, therefore (according to the Port and Retec), would destabilize the shorelines. And this destabilization would necessitate costly infrastructure to reinforce the shorelines.

Curious. I don't recall this concern expressed so bluntly in the 2002 FS. (The "industrial" versus "mixed-use" or "land-use" arguments are simply not compelling because of the lack of evidence and mitigating options that have not been explored.) Is there merit to it? Maybe. It would appear that experts disagree on this point. But here's the real problem: Dredging for federal channel depth, and not dredging *solely* for the purpose of removing contaminants. Mr. Stoner and Retec just immediately assume that if you dredge the inner waterway, it must be to federal depth and that depth will need to be "maintained." These assumptions are simply preposterous and do nothing more than deceive the public and further the Port's endgame of getting a mega-yacht marina at the expense of public health and safety. If you can't get federal money to dredge just contamination, use MTCA money. Put money where it's needed. When Ecology officials were asked at the Public Hearing on 12/11/06 why the WW RI/FS consistently refers to dredging the inner Waterway to federal depth, these officials were clearly stumped. After Murphy Evans was asked to "repeat the question," you could still not answer the question. At this point, Pete Adolphson said, "you have to." This is, again, simply absurd on its face. The simple fact is that there are no engineering reports to substantiate that blanket statement. All evidence available in these documents makes clear that the Port has not really studied this question. It's inappropriate for an Ecology official to make such a dogmatic assertion at a public hearing.

#5-A

3

As thousands upon thousands of citizens have made clear by signing the Healthy Bay Initiative, they want the Whatcom Waterway dredged for the purposes of removing mercury and other contaminants to the maximum extent practical. (And, no, that does not include the Log Pond.

(Cf.http://www.bbayf.org/images/documents/response_to_motion.pdf.) Since it ap-
peared to not interest the Port very much, the Port did not study this issue very care-
fully. If there are hitherto unheard of detailed engineering reports to the contrary, I'll
happily stand corrected. But the readily available evidence suggests that both the Port 4
and Mr. Adolphson are "winging it" on this point. And this is particularly alarming, given
the expressions of certitude (e.g., p. 6-16 of the FS) in the RI/FS.

You need very detailed bathymetric maps and other detailed data of the inner Waterway
for the purpose of carefully determining the precise depth of the contaminated sedi-
ments, the varying levels of contaminations, and how far those contaminated sediments
are above federal depth. (Unlike what one Retec representative has suggested in two
presentations to the public, the very precise locations, depths, and levels of contamina-
tion in the inner Waterway are actually not *that* well understood.) Also, some of the
comparatively "clean" outer channel dredged materials might be usable for capping after 2
hydraulically dredging the inner waterway.

The public doesn't care about dredging to federal depth in the inner Waterway. The
public wants you to dredge only so far as is necessary to get out the mercury and other
contaminants to the maximum extent practical. There are many ways to dredge the in- 1
ner Waterway that were simply not studied because, it would appear, they would rank
too highly in any fair comparison of alternatives vis-à-vis Alt. 5 and Alt. 6.

**5. Consideration of Public Concerns & Pilot Rankings.** The documents refer to pub-
lic concerns in ways that are disingenuous and often very speculative (e.g., p. 7-44 of 13
the FS). And they're often flat wrong. In references to the 2002 WW FS, the Port states
that public feedback was "significant" (it was not) and deliberately conveys the impres-
sion that it was largely unfavorable (it was not). There were compelling reasons stated
for using the ASB as a CDF in the feedback for this FS.

As for "Alternative K" (aka Alt. 5 and Alt. 6), the public has never been given an opportunity until now (ex post facto) to express "concerns" about this remediation plan, despite what Mike Stoner tried to convey in a declaration against People for a Healthy Bay ("...months of public discussion and comment in 2004...."). As Elisabeth Britt stated in her declaration:

"Contrary to an implication in the declaration of Mike Stoner, at 6, while there may have been 'robust public participation' and 'over 100 public meetings' regarding the general topic of contaminated site cleanup, virtually none of that public involvement had anything to do with the new Alternative K... Alternative K was developed by the Port with no public process and I am not aware of nor can I find any record of any environmental or public review of Alternative K."

Furthermore, some Alternatives in the RI/FS are new as of 2006. There's a lot of arrant speculation about what the Port thinks the public will say about these alternatives. To suggest that these speculations reveal bias would belabor the obvious.

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**6. The Marina & the ASB.** There's a prima facie agenda driving these documents: The Port's unwavering desire to build a marina in the ASB. It's now clear that the Port is even willing to sacrifice long-term public health and safety issues in order to get its marina. This is self-evidently deplorable. One land-use desire should not trump the "better" in "faster, better, cheaper," to use the old Demo Pilot evaluative criterion. (Well, given the fact that the preferred alternatives to do not use the ASB to help remediate the Waterway, they pretty much miss on all three points—faster, better, cheaper.) In my view, 14
you have to use the ASB to help remediate the the inner Waterway in a cost-effective manner. You have to, from a strict cost-benefit analysis. The Foundation's Healthy Bay Principles give you numerous ways to use the ASB for the purposes of remediating the Waterway. There are no legal or nonlegal documents that require the use of the ASB as a marina. (Again, see Bricklin's letter at http://www.bbayf.org/images/documents/marina_legal_question.pdf). The RI/FS often references the Supplemental to the ILA that was approved by the City Council on 7/24/06. There are problems with that Agreement with respect to building a marina in the ASB. For one, it does not actually mention the ASB at all. It talks about a marina, but it does not state where it will be built. It talks about between 300–450 "slips," but it doesn't indicate whether those are in the "water" or on "land," as in dry-stacking. There 15
have been no permits to change the status of the ASB from upland to aquatic. There have been no permits that would specifically allow for a marina in the ASB. And there are other problems.

The "marina question" remains an open one. The implicit focus of any RI/FS for the Whatcom Waterway site should never be the construction of a marina. The focus—the explicit focus, if you will—should be on the best cleanup scenario for the least amount of money possible, in accordance to MTCA's evaluative framework. And if that means using the ASB to remediate the inner Waterway, so be it.

As for "capturing new funding sources" (p. 8-12 of the FS), there are many other unexplored possibilities—other than a marina, that is—for the ASB in terms of "funding sources." (I've already explained that building a marina will actually kill jobs ["funding sources"] a the Tissue Mill.) Since a filled ASB would be " below MTCA direct soil contact for unrestricted land use" (2002 FS), the ASB could be used for just about any purpose, including the possibility of ground-floor residences. Unlike the rest of the NWSDA, 16
a filled ASB is really about the only place one could safely contemplate tall buildings. Imagine buildings, a habitat corridor (as was suggested by the Demo Pilot long ago), wastewater treatment, you name it—all in public ownership. It's simply bogus to suggest that a marina is the only viable land-use option for the ASB. In fact, a marina is one 17
of the least desirable options and the majority of the public doesn't even want it (http://www.bbayf.org/polls/index.html).

**7. Human Health Assessment.** I was appalled by the flippant reference to "over estimation" of tribal fish consumption. The population profile information for consuming fish 18
over time is very lacking. You need to perform a thorough human health assessment for a very wide range of population groups.

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**8. Land Before Water.** As has been demonstrated by the Foss Waterway 19
(http://www.thenewstribune.com/news/environment/story/5557873p-5002243c.html) and
generally accepted EPA procedures, it's really a bad idea to remediate a contaminated
waterway before you remediate contiguous and contaminated upland areas. The G-P
Mill site has mercury concentrations as high as 12,500 mg/kg. These are extraordinarily 20
levels of mercury. The caustic groundwater plum, which does not really come up in the
2006 WW RI/FS as far as I can determine, is moving, albeit slowly. One expert has has
told me that it couple possibly hit the Long Pond in approximately 30 years. There are a
lot of unknowns regarding the former G-P Mill site. It strains credulity to hear you claim,
as you have repeatedly, that the "sources of contamination" have stopped by the mere
expressed fact that most of G-P's operations have closed. You will have to study the
site throughly in a RI before you can really make that claim with any confidence. Also, I
remember Mr. Adolphson tell an audience recently that we "don't know" the source or
the reason for the rising mercury levels in samples like SS-WP-1. This area is right next
to the G-P Mill site. This sort of expressed ignorance about something this important
does not engender confidence in the public.

Please switch the sequence of the cleanup projects in the NWSDA. Remediate most of 21
the upland areas before you remediate the Whatcom Waterway site.

**9. Item 11.** The purchase and sale agreement between the Port of Bellingham and Georgia-Pacific is a pretty alarming document. On page 24, there's something called **Item 11**. It states:

"Georgia-Pacific and the Port shall cooperate and jointly seek the agreement of Ecology to accept and issue for public review and comment Alternative "K" proposed by the Port for the remediation of the Whatcom Waterway Site. Neither Georgia-Pacific nor the Port shall publicly or privately, directly or indirectly, advance, promote or attempt to influence any other remediation plan for the Whatcom Waterway site."

And there you it. At this point, this rigged process of ultimately reifying "Alternative K" (aka Alt. 5 and Alt. 6) appears to be working. The Department of Ecology has so far appeared to be willing to bend to the Port's will, even though they have the authority to do otherwise.

Really, if you look at Item 11 and you think about the fact the Mike Stoner is a Port em-
ployee—it boggles the mind that he's the SEPA lead on this project. The people who 22
put him in that position should be ashamed of themselves. At a minimum, this is mani-
festly unethical. In fairness, what is he do? He's practically compelled to dissemble—to
do whatever is necessary—to achieve an outcome that was set in motion years ago. He
simply cannot act impartially or objectively in his State-authorized role to approve envi-
ronmental standards for the Whatcom Waterway site. Therefore, I implore all relevant
persons in authority to remove Mike Stoner as SEPA lead and replace him with some-
one who is neither a Port of Bellingham employee nor a City of Bellingham employee.
(All COB employees are also incapable of acting impartially or objectively in a SEPA
capacity—or, for that matter, in any other capacity related to the Whatcom Waterway
cleanup—because of the so-called "Remediation Interlocal" of 2005.)

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**Conclusion**
The public has been very clear: They want the mercury and other contaminants removed from the Whatcom Waterway to the maximum extent that's technically practical. Such pleas from citizens, though, have thus far been met with either aggressive indifference or morally reprehensible lawsuits intended to shut them up. What I did not expect was the apparent complicity in this rigged process by the Washington State Department of Ecology. I am, frankly, astonished by it. But I remain hopeful. So I'll end with a plea of my own: Please start over. We need another RI/FS and EIS. There are so many ways to do this right that were not considered or investigated because the fix was in years ago. There are so many things, in the narrative of these documents, that are dead wrong. You need to start over. Use the data that's accurate, but start over. Please listen to the thousand of concerned citizens who signed the Healthy Bay Initiative. Honor their hopes that are implicit in their signatures. Listen to Curry Miles, to Barbara Miles, to Spencer Schankel, to Barbara Reisman, to Pat Curvin, to Dick Williams, to Rodd Pemble, to Frances Badgett, and to thousands of other concerned citizens. Please listen.

Sincerely,
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**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT** 23
**December 11, 2006, Bellingham Cruise Terminal**

**Kevin Cournoyer**
Hi, my name is Kevin Cournoyer. I have a lot more comments than I have time for which I'll submit separately. Briefly I would like to make note of the fact that a member of Ecology recently made a comment to KGMI radio that said that this review process that we're undergoing right now is not really for the public to pick the best alternative. The suggestion that Ecology seemed to be making was that Ecology has already done that.

In effect that the public needs to check Ecology's homework. I daren't say I disagree with that. I don't think Ecology has picked the best plan. I believe if Ecology picks either 5 or 6 they really shouldn't be involved in this process. It would be horrible.

There are 8 alternatives, 4 of them cap the ASB. If Ecology didn't want to consider them they shouldn't be in the document. I hope those alternatives aren't there to humor us or to suggest that the Port of Bellingham is in anyway objective or fair minded. Because having observed them for years they are neither of those things.

I was going to talk a lot about the definition of land ownership and I've got in an argument with Mike about that in this very room, but the truth of the matter is that the Port is a public entity. I'll briefly quote their mission statement "The Port pledges to work cooperatively with other entities 24
within the framework of community standards and be a responsible trustee of publicly owned assets." So when we talk about a public hearing we're really talking about an owners hearing.

Very quickly, aquatic vs. upland. For years both the City and the Port officials have explicitly and implicitly defined the ASB as aquatic lands. It is not, but they have tried mightily to convince the public of this. Frank Chmelik, the Port's lawyer, has even made this assertion in legal papers in a lawsuit against Citizens for a Healthy Bay. He said basically that Mark Asmundson wrote a letter that somehow makes the ASB aquatic. That is possibly perjurous. The argument that Mr. Asmundson has the authority to define the status of the ASB with a letter is 25
about as compelling as his ability to chose a city logo. Where still there is this assumption the ASB is aquatic is laced throughout the RIFS and the EIS is stated pretty explicitly in 6-21 of the FS.

On March 16 of this year, an official with Ecology, based locally spoke before the city planning commission and he said the following, quote "Under the shoreline act we consider the ASB filled even though it is a lagoon. It is a wastewater treatment plant, much like a sewage treatment plant. It is not a water body of the state. It is upland."

The next day the Port attempted to get this Ecology official in serious trouble for speaking the truth. Even the governor of the state, Christine Gregoire, was dragged into this nonsense. If you don't believe me ask her. Why was the statement so alarming to the Port of Bellingham? There has not been any permitting, anything whatsoever that has changed the status of this ASB.

The incontrovertible truth that it is still an upland site. Wishing it otherwise will not make it so. So again, why is this so important to the Port? Now that the public has been able to read hundreds of pages of this RIFS we understand why.

First it is important to remember that things Pete Adolphson said about SQS and mercury and sediments in the aquatic environment. It is .41 mg/kg and the upland environment it is 24. The ASB has an average of 6 milligrams per kilogram of mercury, according to MTCA that is considered quite safe. #7-B

**Moderator**
You've got about a minute left sir.

**Kevin Cournoyer**
So what does that mean in the RIFS? It means that all the unfavorable comparisons between the inner water way and the ASB regarding mercury levels are completely erroneous, disingenuous at best.

Over and over again the Port tries mightily to convey the impression that the ASB is extremely high levels of mercury that is flat wrong. The problem, and none of this has been substantiated, I would like to echo what Murphy said regarding dredging depth. I don't think we have enough good data on the dredging depth. I think you should be focusing on the removal of contaminants and not at the federal depth. 26

I need to end with item 11 from the purchase of sale agreement between the Port and Georgia Pacific. It says among other things, either Georgia Pacific nor the Port shall publicly or privately, directly or indirectly advance, promote or attempt to influence any of the remediation plans for the Whatcom Waterway site other than alternative K. Alternative K basically has been reified as Alt 5 and 6.

So there it is, at this point this great process of ultimately reifying Alternative K as Alternatives 5 and 6 is working

With the Department of Ecology so far willing to bend to the Port's will even though they have the authority to do otherwise. If you look at item 11 and you think about the fact that Mr. Stoner is a Port employee it boggles the mind that he is the SEPA lead. He shouldn't be. He is practically compelled to dissemble, and he has, over and over again to achieve the outcome that was set in motion years ago. All of the pleas of thousand of members of this public and the healthy bay initiative have been ignored. 27

I encourage you to listen to these cries of help basically. In so many ways you have not done the right thing. So I encourage you to listen to all the people who have been silenced by the lawsuit. Who have been silenced, 6400 voices. Listen to Mr. Miles, Pat Hurbin, Rebecca Reeseman, to Rodd Pemble. Listen to Frances Badgett. Thank you.

Commenter No. Name / Organization
36 Courtis, David

Commenter Submittals:

A E-mail dated Dec. 13, 2006

B Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | RI | Relative contaminant levels | Expression of relative contaminant levels | 4.11 |
| 3 | RI | Additional data colleciton | Favors more delineation in Waterway areas | 4.10 |
| 4 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 5 | FS | Cost accuracy & cap design | Reuse & disposal of clean sediments | 5.8 & 5.28 |
| 6 | RI | Additional data colleciton | Favors more delineation in Waterway areas | 4.10 |
| 7 | RI | Additional data colleciton | Favors more delineation in Waterway areas | 4.10 |
| 8 | FS | Cost accuracy | Volumes of contaminated sediment | 5.28 |

**Notes:**

EIS Supplemental Environmental Impact Statement

FS Feasibility Study (Volume 2 of Supplemental RI/FS)

RI Remedial Investigation (Volume 1 of Supplemental RI/FS)

RS Responsiveness Summary (Narrative)

**From:** Dot Courtis [mailto:dcourtis@msn.com]
**Sent:** Wednesday, December 13, 2006 4:42 PM
**To:** McInerney, Lucy (ECY)
**Cc:** jjohnston@bbayf.org
**Subject:** Mercury cleanup of Whatcom Waterway

I am writing concerning the draft environmental documents related to the cleanup of the mercury contaminated sediments in the Whatcom Waterway in Bellingham, Washington. I want my comments included in the public record.

Although reasonable people realize that it is impossible to remove 100% of the mercury contamination in the Whatcom Waterway and adjacent areas of Bellingham Bay [eg. ASB Shoulder site], a substantial segment of the population of Bellingham and Whatcom County is dissatisfied with the current, proposed plans for mercury cleanup. They want a much more comprehensive plan that physically removes all surface and subsurface mercury which exceeds levels which are injurious to marine organisms and dangerous to human health. In addition to a more rigorous cleanup, the public expects that the work will be done in an efficient, cost effective way. 1

At the meeting in the Bellingham Cruise Terminal on December 12, you stated that there is "low level mercury contamination in the subsurface of Whatcom Waterway". In addition, the blue colored, summary document distributed at that meeting states that "subsurface sediments range in thickness from less than 2 feet to as much as 10 feet. Average sediment mercury levels are low and decrease with distance from the log pond". However given the sparsity of subsurface data, it is impossible to accurately delineate the vertical and lateral distribution of the concentrations of mercury in the subsurface of Whatcom Waterway. Moreover by using "average values" of mercury contamination, the presence of much higher, much more dangerous levels of mercury could be hidden from the public. 2

These are my recommendations for mercury cleanup:

1. Before proceeding with any mercury cleanup, the Department of Ecology needs to determine the actual concentration of mercury and its lateral and vertical distribution in the entire Whatcom Waterway. To do this, these steps should be taken: 1

*Conduct a very high resolution acoustic survey over the entire Whatcom Waterway. The information from the survey can be used to accurately measure the location and volume of potentially contaminated sediment in the Waterway. In addition and more significantly, a properly designed survey may be able to pinpoint the locations of what were bathymetric lows on the sea floor at the time mercury was discharged into the log pond and transported by marine processes into the Waterway between 1965 and 1979. The sea floor depressions may have preferentially trapped the mercury because of mercury's greater density.

*Drill a closely spaced grid of shallow core holes over the entire Waterway to measure the vertical and lateral mercury concentrations in the potentially contaminated sediments. Any bathymetric lows identified by the very high resolution acoustic survey should be specifically cored to determine if those areas have significantly higher mercury concentrations.

*Prepare maps, cross sections, fence diagrams, etc. to delineate the actual lateral and vertical locations of hazardous amounts of mercury.

2. Using the core hole information that identifies the specific locations of unsafe mercury contamination, develop a site specific dredging program that will remove that material first. This highly contaminated material should be transported to a 2
permitted Subtitle D upland disposal site. Once the sediment with unsafe levels of mercury contamination are dredged and removed from the Waterway, the remaining non hazardous sediment can be dredged with PSDDA disposal or beneficial reuse. 3
Real time monitoring of the second phase of dredging needs to be done so that unanticipated, unsafe concentrations of mercury, if any, can be identified and that material taken to an appropriate upland disposal site.
The recommended approach may save very substantial amounts of money. There is no need to incur the high cost of upland disposal of all of the dredged material if, for example, only 5% is dangerous and 95% is harmless. On the other hand if the data indicate 95% is dangerous and only 5% is safe, the much higher expense of complete upland disposal of the contaminated material is justified.

In summary, only by determining the actual distribution and concentration of mercury contamination can the Department of Ecology develop the best, most cost effective cleanup plan for the entire Whatcom Waterway. #4-B
The Department has a fiduciary duty to the public to do what is best in the public's interest. Although the additional recommended data collection will take time and incur more expenses, I feel that it is justified because the Whatcom Waterway will be completely free from unsafe mercury contamination.

Thank you for the opportunity to comment.

David Courtis
440 Highland Drive
Bellingham, WA 98225
[360] 714-9587

4

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Dave Courtis**
My name is Dave Courtis I live at 440 Island Dr. I'm a geologist or at least was before I retired. The statement was made tonight that there is a low level of mercury contamination in the subsurface. I haven't seen anything that really shows visually what that rate of contamination is 4
over an areal extent. To me that is a critical factor in determining how and why a particular decision should be made.

I would suggest it sounds like there is a much greater need for subsurface core holes to determine the areal distribution of mercury contamination. I think that information should then be put on maps and cross sections and fence diagrams so that you as well as the public can then get a very good idea as to what the distribution really is. I would suggest that the mercury distribution is probably not homogenous. There is probably hot spots. If you have the data, focus on the hotspots, get rid of that first and then you can do dredging or whatever else you want if the 5
residual mercury level is low enough to allow that.

The other thing is if you're dredging can you identify mercury content as your dredging. So once again you can focus on removing that and then through that area that does not require the upland disposal it would reduce the costs considerably. Thank you.

Commenter No. | Name / Organization
--- | ---
37 | Crozier, Sharon

Commenter Submittals:

A Public hearing transcript excerpt

B Public hearing exhibits

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | RI | Other contaminants | Chromium, ammonia and fluoride | 4.17 |
| 2 | FS | Capping concerns | Concerns about long-term effectiveness | 5.2 |
| 3 | FS | Project funding | Taxes and cleanup | 5.26 |
| 4 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |
| 5 | RI | Other contaminants | Chromium, ammonia and fluoride | 4.17 |

**Notes:**

EIS Supplemental Environmental Impact Statement

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RS Responsiveness Summary (Narrative)

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Sharon Crozier**
My name is Sharon Crozier, I live in the Birchwood Neighborhood in Bellingham. Reasonableness and accommodation are social requirements if we are going to get along and accomplish things. But therein also lies mediocrity of vastation and irresponsibility. We have the reasonable cost of this. The reasonable cost of this plan for the return is designed not suit the cleanest solution for the people that it is supposed to serve.

The reasonable timeline, that is another thing nice about this plan. Well I think when it comes to cleaning up our waterfront those of us who already have untold pollution in our drinking water care as much about this as we do about our drinking water. You'll find us really, really patient if you want to do it right. I don't feel frankly real hopeful tonight. People in this day and age often go before their governmental entities and agencies and elected officials and usually what we find is, what a woman before me said, which is it's written to the plan.

The plan may have some changes, a few more testing sites, but in my heart I don't have a lot of hope. We have never in my knowledge had an environmental impact statement required by Ecology down here. Things have gone rampant and accepted. The most recent one I can think of, as far as this portion of the waterfront, more recently on the south side, but on this portion of the waterfront there was the Cogen plant that somehow everybody decided didn't matter even though it was processing all that water through that area

I have here a statement that was given to one of a group of people who have been working on this for some time. It was given to us by a GP employee who actually passed it off in a restroom in a building she was so afraid of losing her job over it. This is actually in the EPA's toxic release data base. As far as I know nothing has ever been commented about it and it's been ignored completely.

One of the many key reports missing on the handling and release of toxic compounds into the waterway by GP is that of chromium. GP admits to having up to 10 million pounds of chromium compounds on site and admits to releasing 8600 pounds of extremely toxic chromium compounds to the bay in one year, in 1995. That's one year. 1

This information is gathered by the EPA and is surprisingly omitted by Ecology and the Port. This information was obtained GP employee as I told you. The report has toxins including mercury, ammonia, chromium, and fluoride. For 1996, over 1.4 million pounds of waste dumped into the air and water at this site in one year, over 3800 pounds per day. This is what GP admits to. All of this contamination should be cleaned up now and not left to future generations. Frankly those who dumped it are covering up this information and should be prosecuted for poisoning the city and the bay and I would personally implicate people who allowed it.

Breaking an investigation into separate issues is a shell game. Not doing Cornwall why you're doing this one and not doing, just segments it ignores the synergistic effect of all the areas and how they compound each other and it's so easy to lose sight of a source if it's not in that. But it might not be in that. It just doesn't seem, it seems like a rush to me, a rush to judgment. This is followed by how the plan, you saw a drawing on the plan. There is scarcely any space in that drawing. It's buildings all the way because the study group, the citizens study group said yes, mixed use would be nice, yeah that would be OK. What the plan they came up with was designed much after Everett and there's not much open space there.

**Moderator**
About a minute left please.

**Sharon Crozier**
Thank you.

The 100 to 500 year event idea is grandiose hope. The capping plan ignores leachate, intrusions
and other things people have said. It's just I want to add that it's a bad idea. Much has been said 2
about the jobs resulting from this locally. Well we don't need the 30 pieces of silver.

Consent agreement is based on short term concerns and a quick, cheap fix. Who will benefit from this other than the people who want to further exploit our port area?

The DOE, Georgia Pacific and the Port of Bellingham should be held responsible for the damage 1
they have allowed. The idea of taxing ourselves certainly is not repugnant if that is our only choice, but it's not right.

This plan could never be allowed to be brought to a vote of the people because we know how
that would go. If you know that's how people feel, and that they're coming from thoughtful,
informed and educated testimony here tonight, not necessarily. To ignore that and continue with 2
the plan that has no vision for the future. No vision for a sustainable, healthy waterfront – would be frankly neglectful and I think criminal. If you see how strongly I feel we'll just have to know we've been thinking about this for along time.

What's good for business is not necessarily good for us. In fact, more and more just the opposite is true. And I'm a business owner.

Thank you.

Sharon Grozier? # 35 Submitted 12/11/06

**1996 GP's Toxic Release Inventory statement taken from the EPA's TRIS database.**

One of many key reports missing on the handling and release of toxic compounds released into the Waterway by GP is that of Chromium.

5

GP admits to having up to 10 million pounds of Chromium compounds on site and admits to releasing 8,600 lbs of extremely toxic Chromium compounds to the Bay in ONE year, in this report 1995.

This information is gathered by the EPA and is surprisingly omitted by Dept of Ecology and the Port. The information was obtained from a GP employee, terrified of losing their job, who passed it on to local activists late at night in a public restroom.

The report lists toxins including mercury, amonia, chromium, fluoride,
in total for 1996 over 1.4 million pounds of waste dumped into the air and water at this one site in one year.
Over 3800 pounds per day. This is what GP admits to.

All of this contamination should be cleaned up now and not left for future generations to deal with. Those who dumped it or are covering up this information should also be prosecuted for poisoning this City and Bay.

Chemical Name: CHROMIUM COMPOUNDS
CAS Number: N090 (Name: GEORGIA-PACIFIC WEST INC.)
SIC Code(s) for this chemical: 2611 2621 2812 2861
Public contact for this chemical: ORMAN DARBY Phone: 3607334410
Technical contact for this chemical: JOHN ANDERSEN Phone: 3607334410
Maximum Amount On Site: 1,000,000 - 9,999,999 lbs (Year: 1996)

Activities and Uses of the toxic chemical at the facility-
Produce (manufacture) the chemical: Yes
Import (manufacture) the chemical: No
Manufacture the chemical for on-site use/processing: No
Manufacture the chemical for sale/distribution: Yes
Manufacture the chemical as a byproduct: No
Manufacture the chemical as an impurity: No
Process the chemical as a reactant: Yes
Process the chemical as a formulation component: No
Process the chemical as an article component: No
Process the chemical for repackaging: No
Otherwise use the chemical as a chemical processing aid: No
Otherwise use the chemical as a manufacturing aid: Yes
Otherwise use the chemical for ancillary or other use: No

| Medium | Release (lbs) | Destination or Method Used |
|---|---|---|
| Fugitive Air | 20 | |
| Stack Air | 770 | |
| Water Release | 8,600 | TO: BELLINGHAM BAY |
| Offsite Tran. | 3 | TO: CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST ARLINGTON, OR USING: Landfill/Disposal Surface Impoundment |
| Offsite Tran. | 150 | TO: ROOSEVELT REGIONAL LANDFILL ROOSEVELT, WA USING: Landfill/Disposal Surface Impoundment |
| Total | 9,543 | |

Management of production-related waste (On=on-site, Off=off-site)-

| Year (*=projected) | 1995 | 1996 | 1997* | 1998* |
|---|---|---|---|---|
| Rel. or Disp. | 5,300 | 10,000 | 10,000 | 10,000 |
| Recycled On: | 3,500 | 2,000 | 2,000 | 2,000 |
| Total: | 8,800 | 12,000 | 12,000 | 12,000 |

"Rel. or Disp" above = quantity released on-site or disposed off-site
Non-production-related waste: 0 (accidental or remedial)
Total waste: 12,000 (Production & Non-Production)
Production Ratio: 1.73

FACILITY REPORT ( TRI DATA )

search used-
Facility name : GEORGIA-PACIFIC WEST*
City : ALL
State : WA
TRI Facility ID: ALL
Year : ALL
Database type : Current (last updated 5/10/200
Level of Detail: High
Output Type : Text
Sort Order : Facility name

This search was taken from RTK NET's (the Right-To-
of EPA's TRIS database. RTK NET is run by OMB Watc
at 1742 Connecticut Ave., NW, Washington DC, 2000
(hours 9:00 AM -- 6:00 PM EST)
The search was done on 01/18/2001.

If you don't see the words *END OF REPORT* at the e
then this Web search didn't complete -- back up and

All release, transfer, and waste quantities in TRI are

Mailing Name: GEORGIA-PACIFIC WEST INC.
Mailing Address: P.O. BOX 1236
BELLINGHAM, WA 982271236
County: WHATCOM Lat/Long: 48.750000 / 122.48
Primary SIC: 2611 Pulp Mills
Parent Company: GEORGIA-PACIFIC CORP. Parent D&
Year: 1996 EPA Region: 10
EPA ID: WAD009252297 TRI ID: 98225GRGPC300W
This facility's name, address, or ownership changedb
Latest TRI name : GEORGIA-PACIFIC WEST INC.
300 W. LAUREL
Latest City: BELLINGHAM State: WA Z
Latest Parent: GEORGIA-PACIFIC CORP.

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Breakdown of releases and waste (by chemical) follow

Methods of source reduction used-
NA

Chemical Name: CHROMIUM COMPOUNDS
CAS Number: N090 (Name: GEORGIA-PACIFIC WEST
SIC Code(s) for this chemical: 2611 2621 2812 286
Public contact for this chemical: ORMAN DARBY Phon
Technical contact for this chemical: JOHN ANDERSEN
Maximum Amount On Site: 1,000,000 - 9,999,999

Activities and Uses of the toxic chemical at the facility-
Produce (manufacture) the chemical: Yes
Import (manufacture) the chemical: No
Manufacture the chemical for on-site use/processing:
Manufacture the chemical for sale/distribution: Yes
Manufacture the chemical as a byproduct: No
Manufacture the chemical as an impurity: No
Process the chemical as a reactant: Yes
Process the chemical as a formulation component: No
Process the chemical as an article component: No
Process the chemical for repackaging: No
Otherwise use the chemical as a chemical processing
Otherwise use the chemical as a manufacturing aid: Y
Otherwise use the chemical for ancillary or other us

Medium Release (lbs) Destination or Method U

Offsite Tran. 150 TO: ROOSEVELT REGIONAL
ROOSEVELT, WA
USING: Landfill/Disposal Surface

Total 9,543

Management of production-related waste (On=on-site

| Year: (*=projected) | 1995 | 1996 | 199 |
|---|---|---|---|
| Rel. or Disp: | 5,300 | 10,000 | 10,000 |
| Recycled On: | 3,500 | 2,000 | 2,000 |
| Total: | 8,800 | 12,000 | 12,000 |

"Rel. or Disp" above = quantity released on-site o

Non-production-related waste: 0 (accidental

Total waste : 12,000 (Production & N

Production Ratio: 1.73

Commenter No. | Name / Organization
---|---
38 | David, Dan

Commenter Submittals:

A Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
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- RS Responsiveness Summary (Narrative)

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Dan David**
Good evening and thank you for the opportunity to be able to say something. For the past couple of weeks I've been trying to figure out something I could say this evening that would have some kind of meaning. I was always having to remind myself of something I learned a long time ago was that if you point your finger at someone you've got three fingers pointing back at you. So a lot of what I thought that I could say would be just that very thing, pointing my finger at the Port and governmental agencies but then I'd also have to look at myself. The difficulty for me and I think one of the difficulties specifically in the Bellingham area is that I believe that I'm here for the same reason that a lot of other people are here and that's because they love the earth and they love nature and more than that they love life and so all these words well for example capping to me when I hear that word and I read about so what does that mean and ok capping and the first word that pops in my mind is band aid it's just to me it's like every other policy, it's like every 1
other avenue and its in every walk of our life put a band aid on it, turn our back, deny its there and it will go away but it won't and the challenge is, when are we going to stand up for life? It's our children as future generations, its ourselves and so I thought I'd go ahead and be brave and say something, I'll just go ahead and go with it, I've been having dreams of walking on this planet and it's bare and the trees are dead and there's no green and I wake up and its like this nightmare but then the real nightmare is in the daytime when I hear its all of how we perceive of life or don't respect it or don't honor it or don't bless it. Now for me this really means something as I'm sure it does for everyone here. I have along with those dreams of when I perceived to be the future, I have dreams going all the way back to Atlantis when it was just the same thing technology for life, technology and all of this stuff up here and we fail to connect with here. Thank you.

Commenter No. Name / Organization
39 Dean, Rod

Commenter Submittals:
A E-mail dated Oct. 19, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | EIS | Marina comments | Favors development of a new marina | 6.8 |
| 2 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Rod Dean [rodandsusan@comcast.net]
**Sent:** Thursday, October 19, 2006 12:42 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham Bay report
Ms. Lucille T. McInerney,
My comments on the Bellingham Bay report follow:

Thank you for the tremendous effort.

I am glad to see that all eight alternatives appear to be environmentally sound. 1

Since I would like to see a marina in the basin alternatives 1-4 do not satisfy me even though they do effectively cap the material.

alternatives 5 and 6 appear to give us the "most bang for the buck." 2

alternatives 7 and seem to be disproportionately expensive.

Rod Dean
Vice-Commodore
Squalicum Yacht Club

| Commenter No. | Name / Organization |
|---|---|
| 40 | Divitt, Matia |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 13, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

-----Original Message-----
From: matia divitt [mailto:matiad@hotmail.com]
Sent: Wednesday, December 13, 2006 9:48 AM
To: McInerney, Lucy (ECY)
Subject: Please clean up Our Bay

Thank you for taking action to benefit future generations.
Please ensure the mercury and other toxins in Bellingham Bay are cleaned
up.
Mercury should not be left in place where it can escape into the marine 1
environment. Our waterfront is valuable, and I want the toxins cleanup up,
hauled away and disposed of properly.
Yes!
In Health--for all beings,
Matia Divitt

---

Commenter No. Name / Organization
41 Dodd, Doug

Commenter Submittals:
A E-mail dated Dec. 7, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Capping costs | Cap monitoring costs | 5.11 |
| 3 | FS | Capping costs | Maintenance & contingent remedies | 5.12 |
| 4 | EIS | Marina comments | Opposes development of new marina | 6.8 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: dodd.guren@juno.com [mailto:dodd.guren@juno.com]
Sent: Thursday, December 07, 2006 8:46 AM
To: McInerney, Lucy (ECY)
Subject: re: Bellingham Bay Cleanup

Dear Lucy McInterney, 1

I wish to log my support of alt. 3 or alt. 7 of the proposed cleanup strategies. I abject to the consideration of the Ports recommendations on the grounds that they signed an agreement with 2
Georgia Pacific to not advocate for cleanup of the waterway, therefore their recommendations are not legitimate analysis of the situation. They also have a conflict of interest since they would be the recipient of revenue from their proposed marina. The public cost would be ongoing 1
and potentially great for capping the toxins in place because of the need for monitoring and repairing the cap. The proposed marina does not benefit the environment or the general public. 2

Doug Dodd
2908 Cottonwood
Bellingham, Wa

Commenter No. | Name / Organization

| Commenter No. | Name / Organization |
|---|---|
| 42 | D'Onofrio, Ethan |

Commenter Submittals:

A Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| | | | | |

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**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Ethan D'Onofrio**
Ethan D'Onofrio, seventeen year Whatcom County resident.. I wasn't going to speak tonight, I didn't really plan too, but I kind of felt compelled to under the circumstances.

I think George kind of hit the nail on the head earlier when he said the fact that we're having a meeting to discuss whether or not to pull tons of mercury out of the bay is kind of just ludicrous. I can certainly appreciate that, seeing as how you guys don't live here, and pretty much everybody in this room is probably about twice my age, a lot older. It' really not a big problem for you guys. But being the age of 25 it is a big problem to me. I understand it is a little disconcerting for some people, but it's infuriating to me to just sit by and watch my planet continue to be destroyed.

So all I ask is for once you make a decision that keep's the interest in my generation and the generations to come at heart. We've got to stop the cycle at some point and here's the opportunity. You guys wanted a public hearing. Here's your public feedback. Everybody in this room wants that mercury out. So the resounding response to your plan is no, come back with a plan that we decide as a community we're in favor of. Thank you. 1

Commenter No. Name / Organization
43 D'Onofrio, John

Commenter Submittals:
A Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

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**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**John D'Onofrio**
John D'Onofrio. I live in Bellingham. I don't envy you, you're work will go a long way in determining the health and the welfare of this community for generations to come and yet apparently you're subjected to enormous pressure to reach a pre-ordained conclusion that furthers the economic strategies at the Port of Bellingham.

It must be difficult, especially if you understand that the people of Bellingham want the mercury removed. People for a Healthy Bay successfully gathered 6400 signatures in just a few short weeks in support of the Healthy Bay Initiative. The initiative was torpedoed by the city council 1
but those signatures must make you somewhat uncomfortable. You have difficult jobs, squeezed as you are between the powerful economic pressures on the one hand and the wishes and the long term health of our community and our children. I don't envy you, but I do sincerely hope that you will do the right thing here and mandate the obviously best choice with respect to remediating the mercury by removing it now when it can be done. Thank you.

Commenter No. | Name / Organization
44 | Duncan, Clint

Commenter Submittals:

A E-mail dated Dec. 11, 2006

B Letter dated Dec. 11, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | RI | BSL Basis | Concerns about basis of BSL | 4.3 |
| 2 | RI | Methlymercury concerns | Uncertainties associated with methylmercury | 4.8 |
| 3 | RI | BSL Basis | Regression analysis of tissue data | 4.3 |
| 4 | RI | BSL Basis | Regression analysis of tissue data | 4.3 |
| 5 | RI | BSL Basis | Regression analysis of tissue data | 4.3 |
| 6 | RI | BSL Basis | Adequacy of existing tissue data | 4.3 |

**Notes:**

EIS Supplemental Environmental Impact Statement

FS Feasibility Study (Volume 2 of Supplemental RI/FS)

RI Remedial Investigation (Volume 1 of Supplemental RI/FS)

RS Responsiveness Summary (Narrative)

#1-A

**From:** Leonard Duncan [mailto:duncancands@msn.com]
**Sent:** Monday, December 11, 2006 8:47 AM
**To:** McInerney, Lucy (ECY); Clint and Sara
**Subject:** Comments concerning Whatcom waterway EIS

Hello Ms. McInerney,
I have attached a word file containing comments re: the BSL portion of the Whatcom Waterway EIS.

Thank you for your consideration.
Clint Duncan

1

To: Lucille T. McInerney, P.E. Site Manager December 11, 2006
WDOE

From:
L. Clint Duncan 2601 Lummi View Drive
Bellingham, WA 98226
Email duncancands@msn.com
Phone 360.961.7614

The following comments concern the BSL (Biological Screening Level) sediment standards evaluation portion of the Whatcom Waterway RI/FS study document of October 2006. 2

Monomethyl mercury is bioaccumulated and biomagnified.[1] It is the species that remediation efforts ultimately address. We, as consumers are poisoned if we ingest contaminated food materials at a rate such that there is excessive monomethylmercury build up in our systems.

Remediation activities should follow a regulatory cleanup standard that is unambiguously derived and ultimately protective of marine and human health. The mercury BSL as described in Section 4.3 of the RI/FS was empirically derived using a small and suspect data set. It oversimplifies the complex link between sediment total mercury content and marine organism mercury content.

The basis of my criticism of the BSL has two parts a) theoretical and b) experimental.

a) We know that biologically mediated chemical reactions at the sediment - water interface result in conversion of mercury (II) species to the toxic monomethyl mercury[2] ion. The rate and extent of conversion of contamination mercury (II) species to monomethyl mercury at the sediment interface depends on a number of physical and chemical factors including

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[1] US EPA (1997): Mercury study report to congress. US EPA, Dec. 1997.

[2] S.M. Ullrich, T.W. Tanton, and S.A. Abdrashitova, **Mercury in the Aquatic Environment; A Review of Factors Affecting Methylation**. Critical Reviews in Environmental Science and Technology, 31(3):241-293 (2001).

temperature, time of year, marine sediment organic content, sediment sulfide content[3], and the total mercury content of that sediment. The BSL formulation as described in section 4.3 "Protection of Human Health" included the variables sediment total mercury content and marine organism total mercury content. The variables organism type, mercury accumulation mode, sediment temperature, time of year, sediment organic content, and sediment sulfide content were not addressed. The extent of influence of other variables should be addressed. For example a recent study of monomethylmercury formation rates in Long Island Sound sediments by Hammerschmidt and Fitzgerald[3] showed the rate of formation of that toxin to depend strongly on sediment organic content and season as well as sediment total mercury content.

Once methylmercury is formed it then is bioaccumulated. Bioaccumulation 2
success depends on a number of factors in addition to sediment mercury content. I will quote Lawrence and Mason[4] who performed studies to assess the bioaccumulation of mercury in estuarine amphipods. They stated "Experimental results coupled with results from a bioaccumulation model, suggest that accumulation of Hg (inorganic) and monomethyl mercury from sediment cannot be accurately predicted based solely on the total Hg, or even monomethyl mercury concentration in the sediment and sediment – based bioaccumulation factors." "All routes of exposure need to be considered in determining the accumulation of Hg (inorganic) and monomethyl mercury from sediment to benthic invertebrates."

Luoma and Rainbow[5] examined metal bioaccumulation for seven metals and 14 species of animals from 3 phyla and 11 marine, estuarine, and freshwater environments. They generated a model that included the predictors metal influx rates from water, influx rates from food, rate constants of loss, and receptor growth rate. Their model predictions were highly successful. Their work is significant in that tells us that the net extent of bioaccumulation in different species is expected.

---

[3] C.R. Hammerschmidt and W.F. Fitzgerald, **Geochemical Controls on the Production and Distribution of Methylmercury in Near-Shore Marine Sediments,** Environ. Sci. Technol. 38,487-1495 (2004)
[4] A.L. Lawrence and R.P. Mason, **Factors controlling the bioaccumulation of mercury and methylmercury by the estuarine amphipod *Lepocherus Plumulosus*,** Environ. Poll, 111,217-231(2001)
[5] S.N. Luoma and P.S. Rainbow, **CRITICAL REVIEW: Why is Metal Bioaccumulation so Variable? Biodynamics as a Unifying Concept,** Environ. Sci. and Tech. 39,1921-1931(2005)

b) Section 4.3 of the RI/FS describes the formulation of the BSL. The Dungeness crab calculations section: Table 1 shows "Paired sediment and Tissue concentrations Data". 23 data pairs are shown. However on Table 2 "Derivation of Bioaccumulation-Based Sediment Mercury Cleanup Screening Levels" the bioaccumulation Regression Data shows the number of sample composites as 12.

Table 1 (Appendix E) shows for N=12; a least squares regression result: 3
y (crab Hg ppm) = .116 (sediment Hg ppm) + .047 $R^2_{adj} = .73$

When the full data set consisting of the 23 data pairs on table 1 (Appendix E) is used, the least squares regression result is: for N=23
y (crab Hg ppm) = .138 (sediment Hg ppm) + .042 $R^2_{adj} =.453$

1) It appears that sample data was averaged. The consequence of that averaging gives what I suspect is an improperly biased regression probability indication. If calculations based on the regression are used as a regulatory standard the --% confidence interval of particular forecast should be shown then discussed as well as the uncertainty of the whole approach!!

2) Were crab meat samples combined? If that is the case wasn't the study corrupted. #4-B

3) There is no data showing a sediment concentration of 1.2 ppm Hg paired with crab tissue data. Is it appropriate to forecast beyond the input data set when defining an enforcement standard?????? 4

The concerned parties should design, and then implement a study aimed at clearly describing the relationship between the Whatcom Waterway mercury load and the steady state mercury concentration in the marine organisms that we consume. We need to understand the factors that control methylmercury formation, bioaccumulation, and then biomagnification if we are to appropriately treat the pollution in the waterway and surrounding areas. 4

Thank you for considering my comments.
L. Clint Duncan

Commenter No. | Name / Organization
45 | Durand, Dawn

Commenter Submittals:
A E-mail dated Dec. 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Dawn Durand [mailto:dawn@dawndurand.com]
**Sent:** Thursday, December 14, 2006 5:25 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms McInerney,
I have been a Whatcom County Resident for 20 years and own a boat at Squalicum Marina. The future of Bellingham Bay is very important to me. I have read the draft RI/FS and EIS documents for the Whatcom Waterway Site. I I support alternatives 5 and 6 as they are currently documented. I hope you will continue in your commitment to the future of this county and this site. 1
Sincerely,
Dawn Durand

Commenter No. Name / Organization
46 Dyson, George

Commenter Submittals:

A E-mail dated Dec. 18, 2006
B Public hearing transcript excerpt

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | RI | Additional data collection | Adequacy of data at head of Waterway | 4.10 |
| 2 | FS | Unit 3A cleanup | Favors additional cleanup in Unit 3A | 5.21 |
| 3 | FS | Additional habitat | Backfill for habitat in Inner Waterway | 5.22 |
| 4 | RI | Additional data collection | Adequacy of data at head of Waterway | 4.10 |
| 5 | RI | Natural recovery | Demonstration of natural recovery | 4.6 |
| 6 | FS | Cap design | Cap stability in wood waste areas | 5.8 |
| 7 | RI | Cleanup levels | Roles of SMS cleanup levels and BSL | 4.2 |
| 8 | FS | Chaning cleanup standards | Reopener risk and changing cleanup levels | 5.30 |
| 9 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 10 | FS | Capping costs | Cap monitoring costs | 5.11 |
| 11 | FS | Capping costs | Cap maintenance & contingent remedies | 5.12 |
| 12 | FS | Costs of navigation dredging | Capping impacts on navigation dredging | 5.13 |
| 13 | FS | Unit 3A cleanup | Favors additional cleanup in Unit 3A | 5.21 |
| 14 | FS | Capping costs | Cap monitoring costs | 5.11 |
| 15 | RI | Additional data collection | Adequacy of data at head of Waterway | 4.10 |
| 16 | RI | Natural recovery | Demonstration of natural recovery | 4.6 |
| 17 | FS | Chaning cleanup standards | Reopener risk and changing cleanup levels | 5.30 |
| 18 | RI | Methylmercury concerns | Favors study of methylmercury processes | 4.8 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: George Dyson [mailto:gdyson@gmail.com]
Sent: Monday, December 18, 2006 1:39 PM
To: McInerney, Lucy (ECY)
Subject: RI/FS comments

Lucille T. McInerney, P.E., Site Manager Department of Ecology,
Northwest Regional Office 3190 160th Avenue Bellevue, WA 98008-5452

RE: Whatcom Waterway RI/FS Comments

Dear Mrs. McInerney, and colleagues:

I have owned property, operated a small business, and lived at the head
of Whatcom Waterway for 18 years. Having attended uncounted meetings,
hearings, and work sessions going back to the beginning of the Bay
Pilot program, I appreciated the opportunity to speak at the public
hearing in Bellingham on 11 December. The following written comments,
in random order, are in addition to my verbal testimony, with apologies 1
for any duplication.

1) I strongly question the designation of Area 3A (at the head of the 2
waterway) as "naturally recovered." The contaminated sediments which
lie below the surface in this area should be removed, and the
intertidal and subtidal areas restored with clean fill. A no action 1
alternative in this area will be a major impediment to rehabilitation
of the Whatcom Creek estuary.

2) Sample data for much of the waterway (especially the inner waterway)
is far too coarse, in both space and time, to accurately characterize 2
what is going on at the moment, or make reliable predictions for the
future. In my opinion, there might be sufficient data to support a
decision for full removal, but there is insufficient data to support a
decision to leave contamination in place.

3) Likewise for data on sedimentation (or erosion) rates in the
waterway. This is critical information to have before making any cap-
in-place decisions, and, as far as I can tell, the data do not exist. 3
The assumption that the waterway enjoys deposition of clean sediments
similar to Bellingham Bay may or may not be true.

4) Historic high deposition rates of woody debris in the waterway have
ceased, which is good for the benthic layer, but also means that
contaminated sediments that lie under that layer of predominantly wood-
waste material may not be sequestered as securely as it might otherwise #4-B
appear.

5) I will defer to Greg Glass, Wendy Steffenson, and others to comment
in detail on issues of toxicology, except to say that the specific
bioassays used to screen for contamination do not appear to be as 4
protective of human health as they should be.

6) Acceptable standards for mercury contamination in the aquatic
environment are likely to change in future years. The cost/benefit 4
analysis of capping vs. removal should take this into account.

7) The preferred remedial alternative will succeed or fail based upon
real-world processes (and interaction between processes) that remain
poorly understood. These include microbial metabolization, storms,
tidal currents, creek discharge, ground water, activities of macro-
organisms (including humans), and future development plans. Far too
little is known about these processes to bet our future on a plan that 5
leaves tons of mercury in place.

8) Failure to remove mercury contamination from the waterway may
significantly impact property values, even if it is not proven to
present a direct threat to human health. These costs should be taken
into account in deciding whether to remove contamination or not.

9) The cost of future (and long term) monitoring does not appear to be
fairly accounted for in the listed alternatives. Same for the added
costs of maintenance dredging that will be required under ALL
alternatives, but may well entail higher costs if the possibility of 6
contamination has to be addressed whenever it is time to dredge.

10) The Port is bound by a purchase & sale agreement that explicitly #5-A
states: "Georgia-Pacific and the Port shall cooperate and jointly seek
the agreement of Ecology to accept and issue for public review and
comment Alternative 'K' proposed by the Port for the remediation of the 3
Whatcom Waterway Site. Neither Georgia-Pacific nor the Port shall
publicly or privately, directly or indirectly, advance, promote or
attempt to influence any other remediation plan for the Whatcom
Waterway Site." This renders the entire review process suspect, and
makes it imperative that DOE take a completely independent look at all
alternatives, NOT just those suggested by the Port.

11) Final comment. The problem with the preferred alternative for the
cleanup of Whatcom Waterway is that it doesn't. It is time to come up
with a realistic, practical, and affordable plan that does.

Thank you for your attention,

George Dyson
435 West Holly St., Bellingham WA 98225
360-734-9226

4

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**George Dyson**
Thank you very much. It is great to finally be here after so many years of watching this process
unfold. George Dyson 435 W Holly St. That's actually lot number 1 on the waterfront lots. So
I'm right there at ground zero. I've been waiting for this clean up for a long time. Just a
disclosure, I'm on the board of the Bellingham Bay Foundation and also I'm the wait list for the
marina for a slip. So I've got all the bases covered. I already made my comment that none of
these plans show any cleanup at the head of the waterway. I would like to put that on the record
again. I think that is absolutely essential. I don't want my kids going down there until something 2
happens.

At this stage, I think we should be arguing about how to do the cleanup not whether to do the cleanup. I think it should just be a given that we're going to remove the maximum practical amount of mercury we should be arguing about how to physically do that. I'm sorry to see us still arguing about whether you know capping versus dredging.

I think ultimately this is cost benefit analysis. This is an economic issue and I really have not
seen the proper spreadsheet that really puts the cost on both sides. We've seen the cost of
dredging. We haven't really seen the cost of not cleaning up, the long term costs are going to 1
come back to haunt us the drop in property values from being seen as being a contaminated area.
The legal and litigation that is undoubtedly going to happen over the years if we leave that stuff
in place. And of course the cost of monitoring is very expensive. In some ways this is sort of
social issue in that the costs for actually cleaning up are sort of blue collar jobs, it's dredging and
railroad trains and disposal and the costs of monitoring forever are very expensive. Consultants
who are going to be doing this until their children all have PhD's and become consultants
themselves.

The data I think is very poor. I've looked at the documents very closely. The sampling grid is
amazingly sparse given the expensive decisions that have to be made. I think we really need to 13
take a much closer look at where the contamination is. That data is sparse not only in space but
also in time. Twenty five samples over years just doesn't make it. It's a very complex area.
Bellingham Bay is sort of a heterogeneous area but the waterway is very different. We have the
currents coming out and coming in. We've got boat traffic, things like that. Also, unless I'm
mistaken, I've seen no data on actual sedimentation rates within the waterway. And we're 14
basing a lot of this on the assumption that it's going to continue sedimentation.

I think standards may change. We were having this discussion 30 years ago while mercury was
fine. We saw it with lead and gasoline was an acceptable thing at one time. It's completely
unacceptable now. I think 20 years from now we may simply tolerate no mercury in our 15
environment. It's not something that...It's likely the levels will go to zero rather than become
looser and that's going to be a very difficult problem if we leave all that stuff in place.

We've also seen, as far as I can tell, no look at the microbiology. We're looking at our bioassays or crabs and other benthic organisms. It really, where the rubber hits the road is microorganisms that actually metabolize and are the first step in getting the mercury into the food chain. We really should be looking at that for a complete study.

The bottom line really, I've been watching this process we had a plan earlier that really did clean up the waterway now we don't. We know we've seen a very clear plan to have a clean ocean marina. The Whatcom Waterway was Bellingham's original marina and we could easily have a clean ocean waterway. My question is why not?

My final comment is I think any plan we have should pass what I would call sort of the private development test. If Georgia Pacific had sold the property to an out of town private developer and they were presenting us with this clean up plan what our reaction be. I think our reaction would be very unfavorable. Sort of smoke and mirrors here. The developers are getting the marina and the community is not getting the clean up that they we deserve and we should insist on.

Thank you very much.

| Commenter No. | Name / Organization |
|---|---|
| 47 | Ebenal General Inc. |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter of Nov. 30, 2006 | Dave Ebenal |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | RI | Remedy preferences | Chromium, ammonia and fluoride | 5.1 & Table 5-1 |
| 2 | FS | Land use changes | Support of land use changes | 6.6 |
| 3 | FS | Navigation channel changes | Support of multi-purpose channel | 6.7 |
| 4 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

Lucille T. McInerney
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

November 30, 2006

Re: Whatcom Waterway Site – Draft RI/FS and Draft EIS Documents

Dear Ms. McInerney:

As you may be aware, Ebenal General is currently the only owner of private property on the Whatcom Waterway shoreline. Safe, cost-effective and long-lasting cleanup of the waterfront is important to me as a property owner and as part of the local business community. From this perspective I recommend Alternative 6 as the most appropriate cleanup approach for the Whatcom Waterway site. 1

I have been working with the Port during the transition of the waterway and former GP site from industrial to a revitalized mixed-use community waterfront. This year I have provided comments in support of the Port and City concepts for changing land use, the proposal to adjust the federal channel, and the adjustment of DNR's harbor lines, as appropriate steps toward the new waterfront. 2

Our property is located on the north side of the waterway near Roeder Avenue. In this area Alternative 6 would address environmental contamination through a combination of targeted dredging, capping and natural recovery. The restored shorelines adjacent to our property and the waterway depths of approximately 18-feet would be sufficient under this cleanup approach to support the types of land use that we anticipate for our property. 1

I expect the benefits of Alternative 6 to be similar for other properties along the Whatcom Waterway and for the community at large. Because the Port has a funding plan for Alternative 6, this proposal is the best opportunity for making a very significant improvement to the city's waterfront. These kinds of opportunities are rare and our community cannot afford to miss this one. If we do, we may be grappling with ongoing environmental problems and acres of under-utilized property for years to come.

Thank you for the opportunity to comment. We appreciate your leadership on this project and strongly recommend that you move forward with the cleanup of the Whatcom Waterway under Alternative 6. 2

Sincerely,

David Ebenal
Ebenal General, Inc.
PO Box 31548
Bellingham, WA 98228

Commenter No. Name / Organization
48 Ekhart, Lance

Commenter Submittals:
A E-mail dated Dec. 18, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Capping costs | Cap monitoring costs | 5.11 |
| 3 | FS | Disproportionate cost analysis | Adequacy of disproportionate cost analysis | 5.25 |
| 4 | FS | Project Funding | Grant funding and insurance coverage | 5.26 |
| 5 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 6 | FS | Capping costs | Costs of cap monitoring | 5.11 |
| 7 | FS | Project Funding | Grant funding and insurance coverage | 5.26 |
| 8 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A



From: Lance Seadog [lanceseadog@hotmail.com]
Sent: Monday, December 18, 2006 3:29 PM
To: McInerney, Lucy (ECY)
Subject: Bellingham Bay cleanup-mercury

December 18, 2006

Dear Ms. McInerney

With regards to the cleanup of the old GP site and adjacent area in Bellingham, WA, I strongly urge you and the Department of Ecology to do everything possible to ensure removal of ALL of the mercury contamination. 1
This includes the inner waterway. I cannot strongly enough express my concern about this deadly toxin lying dormant under some "cap" that admittedly requires "monitoring" to make sure it remains in place. 2

So far I don't see that DOE has done a realistic cost-benefit analysis that includes the cost of monitoring, the risk of remedial action, funding options such as the Port's environmental insurance policy and state MTCA. 1
And I don't see any benefit-value applied to once-and-for-all-time removal of all possible mercury. Peace of mind may not fit into your $ analysis but I believe it is of even greater value than money! 2

We cannot know the future and whether or not capping will prove to be adequate in light of future uses, environment and attitudes. Only complete removal will ensure success in all possible scenarios.

In light of the Governor's recently announced plan for an extensive environmental cleanup of Puget Sound, the minimal and risky plan for capping the mercury in Bellingham Bay seems out of touch with the public's desires. Again, I strongly urge Department of Ecology to reconsider complete removal.

Thank you for considering the public's concerns.

Sincerely,
Lance Ekhart
1659 Birchwood Ave #208
Bellingham, WA 98225
December 18, 2006

Dear Ms. McInerney

With regards to the cleanup of the old GP site and adjacent area in Bellingham, WA, I strongly urge you and the Department of Ecology to do everything possible to ensure removal of ALL of the mercury contamination. This includes the inner waterway. I cannot strongly enough express my concern about this deadly toxin lying dormant under some "cap" that admittedly requires "monitoring" to make sure it remains in place. 3

#4-B

So far I don't see that DOE has done a realistic cost-benefit analysis that includes the cost of monitoring, the risk of remedial action, funding options such as the Port's environmental insurance policy and state MTCA. And I don't see any benefit-value applied to once-and-for-all-time removal of all possible mercury. Peace of mind may not fit into your $ analysis but I believe it is of even greater value than money! 4

We cannot know the future and whether or not capping will prove to be adequate in light of future uses, environment and attitudes. Only complete removal will ensure success in all possible scenarios.

In light of the Governor's recently announced plan for an extensive environmental cleanup of Puget Sound, the minimal and risky plan for capping the mercury in Bellingham Bay seems out of touch with the public's desires.

Again, I strongly urge Department of Ecology to reconsider complete removal. 4

Thank you for considering the public's concerns.

Sincerely,
Lance Ekhart
1659 Birchwood Ave #208
Bellingham, WA 98225

Commenter No. | Name / Organization
---|---
49 | Ernest, Don

Commenter Submittals:

A E-mail dated Dec. 17, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Cost accuracy | Volumes of contaminated sediment | 5.23 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Don Ernest [mailto:don.ernest@fidalgo.net]
Sent: Sunday, December 17, 2006 10:10 PM
To: McInerney, Lucy (ECY)
Subject: Mercury Clean-Up at Georgia-Pacific Site

Lucille: At a recent neighborhood association meeting, I was advised that toxic levels of organic mercury are present in a waterway site formerly owned by Georgia-Pacific and now controlled by the Port of Bellingham.
There are several options being considered for clean-up.
Alternatives 5 & 6 for capping the site are insufficient and will result in further problems later in the future. 1
Alternative #7 for dredging and removing contaminated sediment is the only way to get the job done right. I understand the cost for alternative
#7 is greater, but apparently, the estimate has also been inflated, because it is not necessary to dredge as deep as indicated. Please choose alternative #7 as the appropriate option for dealing with this clean-up, and correct the cost estimate for dredging at the proper depth. 2
Thank you for your attention.

Don W. Ernest, 2320 "I" Street - Apt. #1, Bellingham, WA. 98225
Phone: (360) 752-0904 E-Mail: don.ernest@fidalgo.net

| Commenter No. | Name / Organization |
|---|---|
| 50 | Evans, Murphy |

Commenter Submittals:

| | |
|---|---|
| A | Letter dated Dec. 18, 2006 |
| B | Cascadia Weekly article dated Dec. 6, 2006 |
| C | Public hearing transcript excerpt |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Cost accuracy | Volumes of contaminated sediment | 5.23 |
| 3 | FS | Disproportionate cost analysis | Adequacy of disproportionate cost analysis | 5.25 |
| 4 | RI | Additional data collection | Adequacy of Inner Waterway data | 4.10 |
| 5 | FS | Cost accuracy | Volumes of contaminated sediment | 5.23 |
| 6 | FS | Project funding | Grant funding and insurance coverage | 5.26 |
| 7 | FS | Disproportionate cost analysis | Adequacy of disproportionate cost analysis | 5.25 |
| 8 | FS | Project funding | Grant funding and insurance coverage | 5.26 |
| 9 | FS | Capping costs | Costs of monitoring | 5.11 |
| 10 | FS | Capping costs | Maintenance & contingent remedy costs | 5.12 |
| 11 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 12 | FS | Project funding | Grant funding and insurance coverage | 5.26 |
| 13 | FS | Capping costs | Costs of monitoring | 5.11 |
| 14 | FS | Capping costs | Maintenance & contingent remedy costs | 5.12 |
| 15 | FS | Cost accuracy | Volumes of contaminated sediment | 5.23 |
| 16 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

Brownlie Evans Wolf & Lee

ATTORNEYS AT LAW

murphy@brownlieevans.com

December 18, 2006

Lucille T. McInerney, P.E.
Department of Ecology
Northwest Regional Office
3190 160th Avenue
Bellevue, WA 98008-5452

Dear Ms. McInerney:

I attach a copy of a newspaper article that I wrote and that appeared in the Cascadia Weekly on December 6, 2006. I offer this article as a supplement to my oral comments at the Public Hearing at the Bellingham Cruise Terminal on December 11, 2006.

I would like the Department of Ecology to adopt new alternatives that refine the dredging profile contained in proposed alternatives 3 and 7. My understanding of the dredging profiles in 1
Alternatives 3 and 7 is that they dredge down to the level required to maintain the federal navigable waterway – irrespective of contamination. While I would prefer that the Port maintain the federal navigable waterway throughout the length of the inner Waterway, it is my understanding that the 2
Port intends to de-commission the waterway and therefore such dredging would be inconsistent with the Port's intended land use. It is also my understanding that the DOE has marked down Alternatives 3 and 7 precisely because they are inconsistent with the land use in this regard. Why 1
did DOE propose two alternatives that are inconsistent with the land use and then mark them down for that very reason?

RECEIVED

Please modify the dredging profiles contained in Alternatives 23 and 7 so that they present real alternatives to the "preferred" Alternatives 5 and 6: namely, ones that contain dredging profiles that target the removal of contaminated sediments instead of a soon-to-be-discarded federal navigable channel standard. To that end, DOE needs to take more core samples in the Inner Waterway to 2
better identify the areas of contamination and the amount of sediment that will be need to removed. Once that is done, DOE can fairly compare the cost of the "refined" Alternatives 3 and 7 (remove more sediments from the waterway) to the presently "preferred" Alternatives 5 and 6. 3

The enclosed article contains estimates of insurance coverage and public grants for the cleanup plan. The insurance coverage has been purchased; therefore, its proceeds should be factored into any cost-benefit analysis of the various alternatives. Likewise, the state grant funds should be 4-B
factored into DOE's cost-benefit analysis. DOE should conduct a cost-benefit analysis that takes these funds into account.

Sincerely,

Murphy Evans
1545 Marine Drive
Bellingham, WA

w/Encl.

4





BY MURPHY EVANS

# Sludge FACtoRS

## Assessing the public cost of waterfront cleanup

**FINAL PUBLIC COMMENT**
**WHAT:** Dept. of Ecology Hearing
**WHEN:** Dec. 11, 5:30 pm - 8:30pm
**WHERE:** Bellingham Municipal Court, 2014 C Street

**AFTER YEARS** of speculation, visioning and community discussion with respect to the redevelopment of Bellingham's waterfront, the time is upon us to begin making specific choices about how we intend to clean up the toxic legacy of Georgia Pacific—both in the water and on the land. First up is the remediation of the Whatcom Waterway, a process that will be determined very soon.

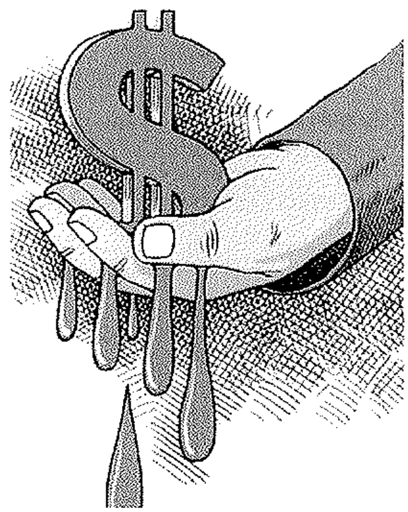
The Department of Ecology (DOE) has proposed eight alternatives for cleaning up the mercury and other toxic sediments in the Whatcom Waterway. Those alternatives range from removing practically nothing (Alternative No. 1) to removing practically everything (Alternative No. 8).

As we might expect, the costs of these alternatives vary widely. What's surprising, however, is that the percentage of each alternative that will be funded by local taxpayers also varies widely.

The Port of Bellingham has endorsed proposed Alternative 6, which would clean out the Aerated Stabilization Basin (the ASB pollution lagoon) and ship those toxic sludges to a certified landfill elsewhere, but leave mercury and other toxic sediments in the waterway under a three-foot cap of clean fill. To my mind, Alternative 6 gets the fix backwards: it keeps the toxic sediments in the natural environment (the Whatcom Waterway) removes them from the engineered containment facility (the ASB). The reason the Port has endorsed Alternative No. 6 is that it cleans out the ASB in anticipation of the Port's plan to build a new marina there. In other words, the Port's desire for a marina drives its cleanup plan.

In deference to the Port, Ecology has endorsed Alternative 6 as a "preferred alternative." From now until Dec. 18, DOE is accepting public comment on the various proposed alternatives. After Dec. 18, DOE will take that public comment into consideration and make a decision about which cleanup plan to mandate for the Whatcom Waterway.

By law, Ecology is required to consider not only the comparative public health and environmental benefits of the proposed alternatives but also their



estimated costs. Unless there is strong public comment in opposition to "preferred" Alternative 6, it will almost certainly be implemented as DOE's mandated cleanup plan.

A fair amount of public discussion has involved the comparative public health and environmental advantages of dredging mercury versus capping it in place. To date, every environmental group that has taken a position on the Whatcom Waterway cleanup plan has advocated removing mercury from the waterway and disposal in an approved upland site—contrary to the Port's preferred Alternative 6. The Bellingham Bay Foundation, RE Sources, People for Puget Sound, Washington Toxics Coalition, Conservation Northwest, Washington Conservation Voters, Olympic Environmental Council, Mount Baker Sierra Club, and the Institute of Neurotoxicology & Neurological Disorders all favor removal as the most protective remedy. There has been very little discussion about the comparative *public costs* of the two approaches. Ecology has estimated the cost of each of its proposed eight alternatives; however, these cost estimates do not accurately measure the actual costs to the public because they do not take into consideration either the environmental insurance

policy that the Port purchased or the state grants that have been promised to the project. 4

When the Port purchased the GP site for $10 in January 2005, the agency took on GP's environmental liabilities associated with the Whatcom Waterway. The bulk of these environmental liabilities stem from mercury and other toxins that GP 5 had historically dumped directly into the Whatcom Waterway.

In order to limit its potential liabilities, the Port paid approximately $29 million for an insurance policy to cover potential cleanup costs associated with the Whatcom Waterway and the upland portions of the GP site. The insurance policy covers as much as $45.7 million in cleanup costs associated with the Whatcom Waterway. The insurance policy does nd cover cleanup costs associated with the ASB. Cleanup costs associated with the ASB must be paid by the Port, not the insurance policy.

In addition to this insurance coverage, Ecology has promised as much as $25 million in state grants toward cleanup costs. These funds will be available to the Port as a 1:1 matching grant. Ecology grants will match every dollar the Port spends on waterway cleanup up to a maximum of $25 million. At present, these funds are available for cleanup of the ASB as well as the waterway.

### Cost of Port's plan

The estimated cost of Alternative 6 is $44 million. Of this amount, $26.8 million is associated with the dredging and removal of toxic sludges from the ASB and $17.2 million is associated with the "capping" of toxic sediments in the Whatcom Waterway.

The Port's insurance policy would chip in approximately $8.6 million toward the cost of capping the Whatcom Waterway, but provide nothing toward the cost of cleaning the ASB. State grants will provide as much as $22 million toward the cost of Alternative 6. Thus, the Port—and the local public—will have to pay approximately $13.4 million if DOE mandates the Port's preferred Alternative 6.

On top of this near-term cost, Alternative 6 would impose costs associated with the long-term monitoring of the mercury that has been left in place in 6 the Whatcom Waterway. At present, neither Ecology nor the Port's consultants have provided a reasonable estimate of the costs associated with this long-term monitoring. Instead, Ecology has provided an identical estimate—$640,000—for the long-term monitoring costs of various cleanup alternatives. Yet, realistically, the long-term monitoring costs should be greater for plans that leave mercury in the natural environment than alternatives that propose to remove it.

Finally, Ecology's estimate for Alternative 6 does not include any contingency costs associated with the risk that the "cap" in the waterway may have to be repaired. This is also unrealistic.

In 2000, Georgia-Pacific capped the contaminated log pond area of the Waterway with approximately 43,000 cubic yards of clean fill material. Based on DOE estimates, the cost of this cap was between $1 million and $1.5 million. By 2005, DOE knew that a -A portion of this cap must be repaired. Presently, DOE estimates that it will cost $732,000 to make these repairs. In other words, the cost of the fix—after only five years—is somewhere between 50-75 percent of the original cost of the project.

## PUBLIC COSTS OF CLEANUP ALTERNATIVES

| | ALT 3: ASB AS LANDFILL | | ALT 6: ASB AS MARINA | | ALT 7: FULL CLEANUP | |
|---|---|---|---|---|---|---|
| BENEFITS | Clean waterway | | Enormous "ocean marina" | | Clean waterway plus marina | |
| WHAT'S INVOLVED | Dredge & transfer toxins from waterway to ASB | $34 | Dredge & truck away ASB sludge | $26.8 | Dredge & truck away ASB sludge | $26.8 |
| | | | Cap mercury in Whatcom Waterway | $17.2 | Dredge & truck away waterway toxins | $47.2 |
| TOTAL COST | | $34 | | $44 | | $74 |
| INSURANCE PAYS | | $17 | | $8.6 | | $23.6 |
| STATE PAYS | | $17 | | $22 | | $25 |
| LOCAL TAXPAYERS PAY | | $0 | | $13.4 | | $25.4 |

SOURCE: Dept of Ecology cost estimates; cost in millions

A model in miniature, the log pond repair involves the identical site, the identical conditions and the identical solution (capping) as Alternative 6. Ecology's cost estimate for Alternative 6 should contain a contingency cost for future repairs. While contingency cost may not be 75 percent of the total capping cost ($17.2 million x .75 = $12.9 million), it is still a big number.
**PUBLIC COST: $13.4 MILLION**

### ASB as receiving area

Alternative 3 would hydraulically dredge and remove the toxic sediments from the Whatcom Waterway and transfer them directly to the ASB. The ASB would then be capped with clean fill.

Alternative 3 has the advantage of removing toxic sediments from the natural environment (the Whatcom Waterway) and placing them in a facility engineered to contain toxic material (the ASB). From the Port's perspective, the disadvantage of proposed Alternative 3 is that it would not allow them to convert the ASB to a marina.

The cost of Alternative 3 is $34 million. The Port's insurance policy would chip in approximately $17 million toward the cost of this alternative. State grants would contribute another $17 million toward the cost of this alternative. Thus, the Port—and the public—will incur virtually no additional costs if Ecology mandates Alternative 3.
**PUBLIC COST: $0 MILLION**

### Cost of complete removal

Alternative 7 would dredge and remove the toxic sediments from the Whatcom Waterway as well as the ASB. All of those toxic sediments would then be transported for disposal to a landfill elsewhere.

Alternative 7 has the advantage of removing most of the mercury and other toxins from the waterfront portion of the GP site. Not only would the Whatcom Waterway be clean, but the ASB would be clean as well. If the Port chose to build its marina at the ASB location, it would be free to do so, because like Alternative 6, this alternative cleans out the ASB.

The cost of Alternative No. 7 is $74 million. Of this amount, $26.8 million is associated with the dredging and removal of toxic sludges from the ASB, and $47.2 million is associated with the dredging and removal of toxic sediment from the Whatcom Waterway.

The Port's insurance policy would chip in approximately $23.6 million toward the cost of Alternative 7—one-half the cost of dredging and removing the toxic sediment from the Whatcom Waterway; however, the Port's insurance policy would not contribute toward the cost of dredging and removing toxic sediments from the ASB. State grants would contribute up to $25 million toward the cost of Alternative 7.

Thus, the Port—and the public—will have to pay approximately $25.4 million if DOE mandates Alternative 7.
**PUBLIC COST: $25.4 MILLION**

Alternatives 3 and 7 would remove 361,000 more cubic yards of sediments from the waterway than Alternative 6. This amount is the equivalent of a mound of earth 570 feet long by 570 feet across by 30 feet high—or a 7½-acre parcel covered with a 30-foot-high pile of dirt. These sediments would weigh approximately 1 billion pounds. At present contamination estimates of 3-4 parts per million, these sediments would contain an estimated 3,000 to 4,000 pounds of mercury.

It is clear why the Port opposes Alternative 3, even though it removes the mercury and other toxins from the Whatcom Waterway and its cost would be almost completely covered by the insurance policy and state grants: Alternative 3 does not allow the Port to use the ASB for a marina.

It is less clear why the Port opposes Alternative 7. Alternative 7 would allow the Port to build its marina. Because the plan would remove the mercury from the Whatcom Waterway, it would avoid the cost of long-term monitoring—and of possible future remediation—associated with leaving the mercury in the waterway. A cost-benefit analysis might demonstrate these advantages alone are worth the additional cost of approximately $12 million.

Sadly, the Port long ago prevented itself from even considering Alternative 7.

In January 2005, when the Port purchased the property from GP, the agency specifically agreed it would only advocate for a cleanup plan that left mercury and other toxins behind in the Whatcom Waterway. The Port's agreement with GP prevents the agency from supporting any cleanup plan that calls for the dredging and removal of toxins from the Whatcom Waterway.

But the fact that the Port has prevented itself from advocating a more thorough cleanup does not mean that Ecology cannot mandate one.

Ecology is not bound by the Port's agreement with GP. The state agency can, and should, order the Port to dredge and remove—not cap—mercury in the Whatcom Waterway. This will only happen if Ecology hears from the public before Dec. 18. To contact the state Department of Ecology, write to Lucy McInerney at lpeb461@ecy.wa.gov. Please comment at the public hearing on Dec. 11. Remember silence is assent!

*Murphy Evans is a local attorney and a board member of the Bellingham Bay Foundation*

4

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Murphy Evans**
Murphy Evans, 1545 Marine Drive. Like George I'm a member of the Bellingham Bay Foundation. I have four basic comments on the DOE's cost benefit analysis.

My first comment is I think the raw estimates that the DOE uses to characterize the 8 different plans are really the wrong numbers. That should be evaluated in terms of a cost benefit analysis. I think the numbers the DOE should be looking at are the actual cost to the public. Not the estimated costs of the clean up plan. When the Port purchased this property for ten dollars it took 2
on the environmental liabilities, including the liabilities associated with the Whatcom Waterway. In planning for that liability it paid approximately $29 million for insurance coverage. So they've spent that money. That money has been spent and the insurance coverage has been purchased. So the benefit of that to the public should be going in to the cost benefit analysis that the Department of Ecology looks at. So when it looks at each of the 8 different proposed plans it should take out the portion that the insurance coverage will be paying because that is not going to be a cost to the public. That cost has already been incurred by the public when the insurance was purchased.

Secondly, there has been a promise of MTCA state grants on a 1 to 1 basis as I understand it up to $25 million. It is my understanding that those grant monies have already been collected. So that benefit should be included in and taken out of the costs of these various alternatives so that we should come up with what is the additional cost to the public after insurance is taken into account and after the promised state funds are taken into account.

The second flaw that I see in the cost benefit analysis is I understand it there is a long-term monitoring number built into the RIFS. But the number is the same for virtually every proposal. I think it's about $640,000 for each of these proposals. But I think the long-term monitoring 1
requirements are quite different for each proposal. Obviously if the mercury is taken out of the site or most of it is taken away. The need for long-term monitoring is much less than if the mercury remains in place for years to come.

So instead of having one ballpark number for each of the plans the long-term monitoring costs need to be fine-tuned and taken into account whether the actual likely risks and the monitoring to take those risks into account.

The third area that I think is flawed in the present cost benefit analysis is the failure contingency. Probably the best and this is the risk of failure and cost of dealing with that contingency. We 13
have an example of what that failure might cost here in this exact location. The Log Pond remediation plan that was implemented by Georgia Pacific in 2000. We don't know what the cost of it is but it's our guess that it's somewhere between $1 and $1.5 million. They did a cap-in in place there. The current RIFS has an estimate for fixing the Log Pond where the erosion has take place of approximately somewhere around $700,000. So there's in 5 years there's been a failure at this site in this exact location. The same location that alternatives 5 and 6 plan to cap,

and the cost is somewhere around half of what the original capping of the Log Pond was. There needs to be that failure contingency the cost of fixing the cap needs to be built into the cost benefit analysis. I think the risk of failure and the cost of that failure is much greater in alternatives 5 and 6 then in the alternatives that remove the mercury. Because the mercury is not going to be there and the risk is much less.

My final area of comment about the current cost benefit analysis is the dredging profiles that we used in alternatives 3 and 7. I asked about this during the question and answer period and my impression is that the dredging profiles for alternatives 3 and alternative 7 are identical to the dredging profiles that were adopted by Georgia Pacific as part of the RIFS that led to their alternative J.

As I understand the process Georgia Pacific was required by the Port of Bellingham to dredge,
deep dredge, the whole channel because the Port said we want this to be a federal navigable 14
waterway so you have to dredge to that length of the channel, irrespective of where the
contamination was. Alternatives 3 and 7 carry that profile forward even though now the Port of
Bellingham is saying we want to decommission the waterway, we don't need it to be that depth.
In fact my understanding is alternative 7 gets marked down because it dredges in areas that may
compromise the shoreline. Why are we using that as the profile for that alternative? What instead
should be used as the dredging profile is where the contamination is. My concern is that given
the present core sampling that has been done we don't have a very clear picture of where that
dredging is. So I think more core samples need to be made so that we can identify where the
dirty stuff is instead of taking out 300,000 cubic yards of sediment. More is taken out in 7 than in
6. Well a lot of that is clean we don't need to remove that and take it to an upland site. It's clean.
We just need to take the dirty stuff away. I think the costs of alternatives 3 and 7 would go down 15
if we only targeted where the dirty stuff and not get it back down to the federal navigable
waterway.

Commenter No. 51 — Name / Organization: Fairbanks, Chris

Commenter Submittals:

A — Letter received Dec. 18, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Navigation channel changes | Support for multi-purpose channel | 6.7 |
| 3 | EIS | Navigation channel changes | Support for deep-draft uses at BST | 6.7 |
| 4 | RI | Cleanup levels | Support of site-specific cleanup levels | 4.2 |
| 5 | FS | Cap monitoring | Development of long-term monitoring plan | 5.10 |
| 6 | FS | Navigation disturbances | Depth of anchor drag | 5.4 |

**Notes:**

EIS — Supplemental Environmental Impact Statement
FS — Feasibility Study (Volume 2 of Supplemental RI/FS)
RI — Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS — Responsiveness Summary (Narrative)

16

517 Briar Road
Bellingham, WA 98225

Ms. Lucille T. McInerney
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

RE: Whatcom Waterway RI/FS

Dear Ms. McInerney,

I am writing in support of Alternative six of the Whatcom Waterway remediation proposals. As I understand from reviewing the documents, this alternative will:

- Provide protection by minimizing exposure pathways of contamination to benthic organisms, human health, and ecological health; 17
- Avoid resuspension of contaminated sediment, to the extent possible;
- Avoid disturbance of naturally capped areas;
- Provide a fair balance of cost and benefits;
- Enhance aquatic habitat

This alternative also gives our community the greatest flexibility for future actions and uses as we move
forward with our redevelopment plans for the waterfront. It is important to keep this flexibility for
current planned uses and for adapting to future needs as they arise. Alternative six provides the best
flexibility by: 18

- Creating a locally managed multi-purpose channel in the inner waterway;
- Allowing for continued use of the deep-draft shipping terminal; 19
- Allowing for aquatic use of the ASB.

I also support the clean-up standards set for the Whatcom Waterway that are more strict than Federal and 20
Washington State standards. These standards are appropriate to ensure protection of ecological health of
the waterway and Bellingham Bay and human health of the community.

As the remediation plan is further developed I encourage you to develop a long-term monitoring plan to
assess the integrity and performance of the remediation methods especially the engineered caps. The 21
monitoring plan should be flexible to allow for use of improved assessment tools and to use adaptive
management for repairs and further remediation if needed.

I do question however, the analysis of anchor drag in the last paragraph of section 6.3.3 of Volume 1,
page 6-21. The text suggests a very shallow mixing depth and consequently I checked the reference and 22
found that the mixing depth stated in the reference was significantly deeper than stated in the RIFS.

Thank you for your consideration,

Sincerely,

Chris Fairbanks

Chris Fairbanks

Commenter No. Name / Organization
52 Feld, Arlene

Commenter Submittals:
A Comment sheet

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Project funding | Concern over taxes & cleanup funding | 5.26 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

# How to comment to the Department of Ecology

To submit written comments on the 2006 ***Draft Remedial Investigation/Feasibility Study*** and ***Draft Supplemental Environmental Impact Statement***, you may use the form below and leave it with us and we will pass your comment to DOE. Or you may submit your comment to:

Lucille T. McInerney, P.E., Site Manager, at Ecology's Northwest Regional Office,
3190 160th Avenue, Bellevue, WA 98008-5452,
by phone at (425) 649-7272 or by email at lpeb461@ecy.wa.gov.

*(name and address optional)*

Name: Arlene Feld Address: 1570 Broadway
City: Bellingham Zip: 98225 Email: arlene_feld@hotmail.com

The documents are designed to describe the results of the environmental investigations and evaluate the feasibility of several sediment remediation alternatives for the Whatcom Waterway site. The documents also identify a preferred remedial alternative. Do you have any comments about whether the evaluation performed in each of these documents is accurate and/or complete? If so, please describe:

I believe the best way to clean up 19
the area is dredging. There are some
matters that require we use the highest
standard possible in spite of the cost.
In all matters, health and safety
are a first priority. If it is
costly then we must find the funds.
The businesses that will be located
in such an exquisite location must
pay a premium for it, as they do in
all waterfront locations. All other
groups that benefit also must bear
the costs. The general public already
are bearing increasing taxes in renting 20
and home ownership.

This was very informative
and I hope you see that our knowledgable
citizens wish you to stand up for
us and get us a clean bay.

Commenter No. | Name / Organization
53 | Ferris, Ryan

Commenter Submittals:

- A  E-mail dated Nov. 29, 2006
- B  Attached document entitled "What Lies Beneath"
- C  E-mail dated Dec. 11, 2006
- D  Public hearing transcript excerpt
- E  Public hearing exhibits

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | RI | Radioactive materials | Concerns about radioactive materials | 4.16 |
| 2 | RI | Radioactive materials | Concerns about radioactive materials | 4.16 |
| 3 | RI | Radioactive materials | Concerns about radioactive materials | 4.16 |
| 4 | RI | Radioactive materials | Concerns about radioactive materials | 4.16 |
| | | | | |

**Notes:**

- EIS  Supplemental Environmental Impact Statement
- FS  Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI  Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS  Responsiveness Summary (Narrative)

21

**From:** Ryan M. Ferris [rferrisx@comcast.net]
**Sent:** Wednesday, November 29, 2006 11:29 PM
**To:** McInerney, Lucy (ECY)
**Cc:** editor@nwcitizen.us
**Subject:** Please submit this for the record for the Whatcom Waterway Clean-up

**Attachments:** WhatLiesBeneath_003.pdf

Dear Lucy McInerney:

Please submit the attached document as comment on the Whatcom Waterways clean up project. I would also like all four CDs listed here:

http://www.ecy.wa.gov/programs/tcp/sites/whatcom/ww.htm

Or you can burn them onto 1 DVD if you like.

Thanks,

Ryan M. Ferris
1401 E. Victor
Bellingham, WA
98225

360.676.2734 home
360.815.6856 cell

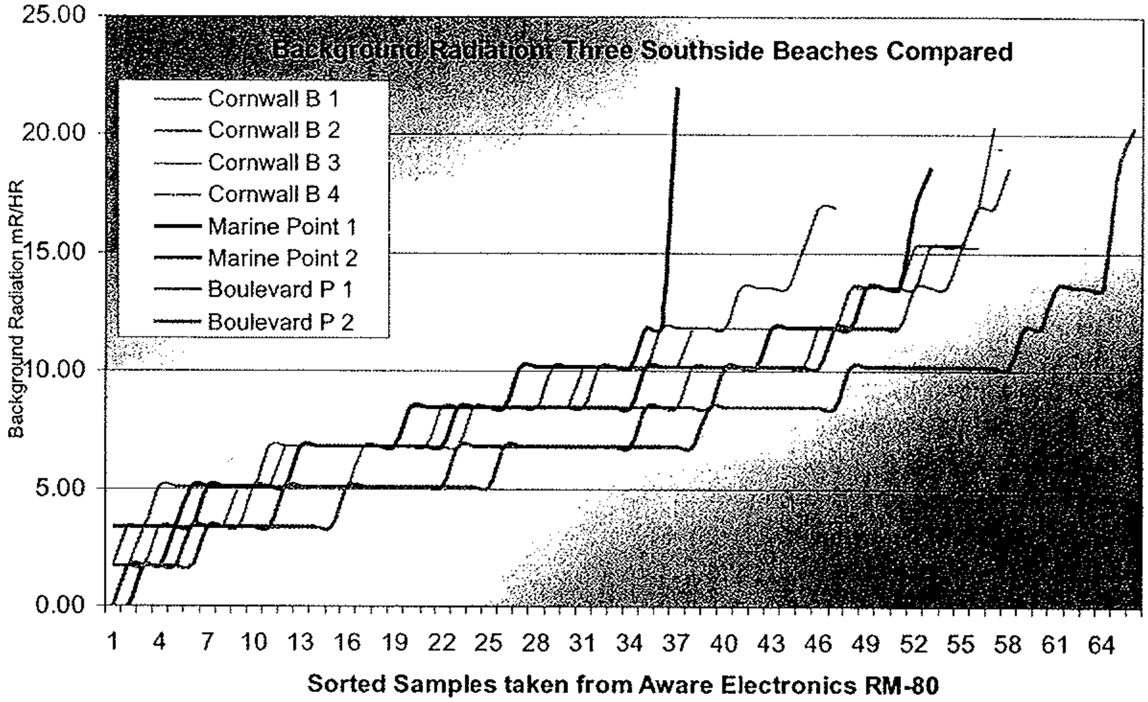
## What Lies Beneath... 22

The talk is enough to make your heart skip a beat. The very idea that Georgia Pacific may have accepted nuclear waste from Hanford and shoved it down the coal mines under Bellingham Bay is a proposition that, if proven, would send shivers of fear and disgust down the spine of any investor or family in Whatcom County. Is there any proof to support this contention? Or is the remaining proof disappearing as GP carts away historical documents by the truckload?

Whatcom County has an exceptionally high "age adjusted" cancer rate, ranking fifth out of thirty-nine Washington Counties with nearly 900 incidences of cancer per year. Anyone familiar with our county's history or current industrial base might find many potential environmental sources of cancer: 23 two oil refineries, a pulp plant, numerous dumpsites, a degrading water supply, agricultural pesticides, etc. But most insidious of all potential carcinogens are radioactive materials. Were they dumped in the Cornwall landfill? One Port of Bellingham document seems to suggest so. It documents water table testing that found Cesium 127 (typically medical radiological waste) and Tritium (an isotope of Hydrogen and a by product of nuclear fission) found in the Cornwall Landfill water table. What do Geiger counters tell us at beach side on the south side parks? I set out last week to find out, since no public agency seems to be doing this type of testing. Although I did not find any results above 25 micro Roentgens/hour at either Marine Point, Boulevard Park, or Cornwall Beach, I really have no idea if my testing can be considered conclusive.

And this is the precisely the problem in Bellingham now, where our Council recently voted 6 - 0 to sue a citizen's organization to prevent a petition from reaching the ballot that would authorize extensive environmental testing of the Cornwall Lagoon. The proposal would mandate that this testing be completed *before* the Port of Bellingham and the City Council allow the landfill to be dug up to build a very expensive marina. As citizens, we should not have to try to find out the truth for ourselves, as I did last week while sitting on a very dirty and glass littered Cornwall Beach at low tide; logging background radiation against the surf. The stakes are high indeed for such investigative work. But the sage will remind the Bellingham City Council that illegally dumping radioactive material is a federal crime, as would be conspiracy to cover up evidence of such dumping.

What is called for here is ruthless full disclosure and testing. No one wants to face the demons of past lives. Unfortunately, such demons often live to haunt the present until what lies beneath is exposed.


Background Radiation: Three Southside Beaches Compared
Cornwall B 1
Cornwall B 2
Cornwall B 3
Cornwall B 4
Marine Point 1
Marine Point 2
Boulevard P 1
Boulevard P 2
25.00
20.00
15.00
10.00
5.00
0.00
Background Radiation mR/HR
1 4 7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64
Sorted Samples taken from Aware Electronics RM-80

24

**From:** Ryan M. Ferris [mailto:rferrisx@comcast.net]
**Sent:** Monday, December 11, 2006 11:13 AM
**To:** McInerney, Lucy (ECY)
**Cc:** tim_paxton
**Subject:** second attempt to send letter....

Dear Ms. Lucy McInerney:

I am unsure as to why you did not get this e-mail the first time. Please submit for the public hearing record of **Whatcom Waterway Site-Bellingham Environmental Cleanup** the linked 1996 document from **Analytical Resources, Incorporated** apparently showing evidence of the radioactive substances **Tritium** and **Cesium 137** in the Cornwall Landfill. 25

Please also submit the linked jpg from statecancerprofiles.cancer.gov/micromaps showing dramatically increasing childhood cancer rates in Whatcom County. As a member of the general public concerned about extraordinarily high cancer rates in Whatcom county, including increasing child cancer rates , I would ask the Department of Ecology and all environmental organizations involved to include radiological and radioactive testing of all Waterfront GP properties and recommend appropriate remediation. These documents are available at:

http://www.rmfdevelopment.com/public/RadioactiveWhatcom/

Thank you for your time,

Ryan M. Ferris
1401 E. Victor
Bellingham, WA
98225

360.676.2734 home
360.815.6856 cell

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Ryan Ferris**
Thanks for letting me give my testimony. I have entered some documents into the record, but these are nice color prints. I notice that some of the photocopies just are kind of flat. So these are color prints and they're clear. My name is Ryan Ferris. I live in the Columbia neighborhood and I have two major concerns about the waterway cleanup.

My concerns relate to the Cornwall Landfill but they also relate to the aeration pond cleanup.

In looking at statecancerprofiles.cancer.gov it's easy to see that Whatcom County has fairly high cancer rates. In fact, in recent trends we outstrip every other county for cancers under 20 years of age. So that means that age group is suffering higher cancers at an increasing rate.

So I think that the discussion about toxicity in the waterfront is important because we're going to create public infrastructure on an area which had high levels of toxicity.

My second concern is about radiological dumping in the waterfront. In your documents I didn't see, perhaps I didn't look hard enough any testing of radiological emissions or dumping in the waterfront. I'm concerned about this because I have a document from 1996 from Landau and Associates that seems to show levels of tritium and cesium 137 in the water table at the Cornwall Landfill. My question to you is will you be testing for radiological emissions and radiological dumping be part of the RIFS and the Model Toxics Process.? 28

Analytical Resources, Incorporated
Analytical Chemists and Consultants

General Chemistry
Sample Data

Provided to

Landau Associates, Inc.

Project Name
Port of Bellingham
Cornwall Landfill
No. 1020.32

ARI Job No.
Q243

Prepared by

Analytical Resources, Inc.

October 11, 1996

ANALYTICAL
RESOURCES
INCORPORATED

OCHEMISTRY ANALYSIS DATA SHEET

Sample No: Lab Control Sample

Sample ID: Q243LCS
ID: 96-16081
Water

QC Report No: Q243-Landau Associates, Inc.
Project: Site Investigation
1020.3?

Release Authorized:
Reported: 10/04/96 Robert [illegible]

LAB CONTROL SAMPLE RECOVERY REPORT

| [illegible] | SPIKE FOUND | SPIKE ADDED | PERCENT RECOVERY |
|---|---|---|---|
| zed 10/01/96 | | | |
| [illegible] Alpha LCS | 25.3 | 22.3 | 113% |
| ed 10/01/96 | | | |
| Beta LCS | 35.5 | 39.9 | 89.0% |

reported in pCi/L

CONTROL LIMITS
Recovery 70 - 130 %

y QA Limits

FORM [illegible] RadChem

27

RADIOCHEMISTRY ANALYSIS DATA SHEET

[illegible]
Lab ID: [illegible]
Matrix: Water

Date Sampled: 09/2[illegible]/96
[illegible]

Data Release Authorized: Robert E. Gunbar
Date Reported: 10/04/96

MATRIX SPIKE/MATRIX SPIKE DUP RECOVERY REPORT

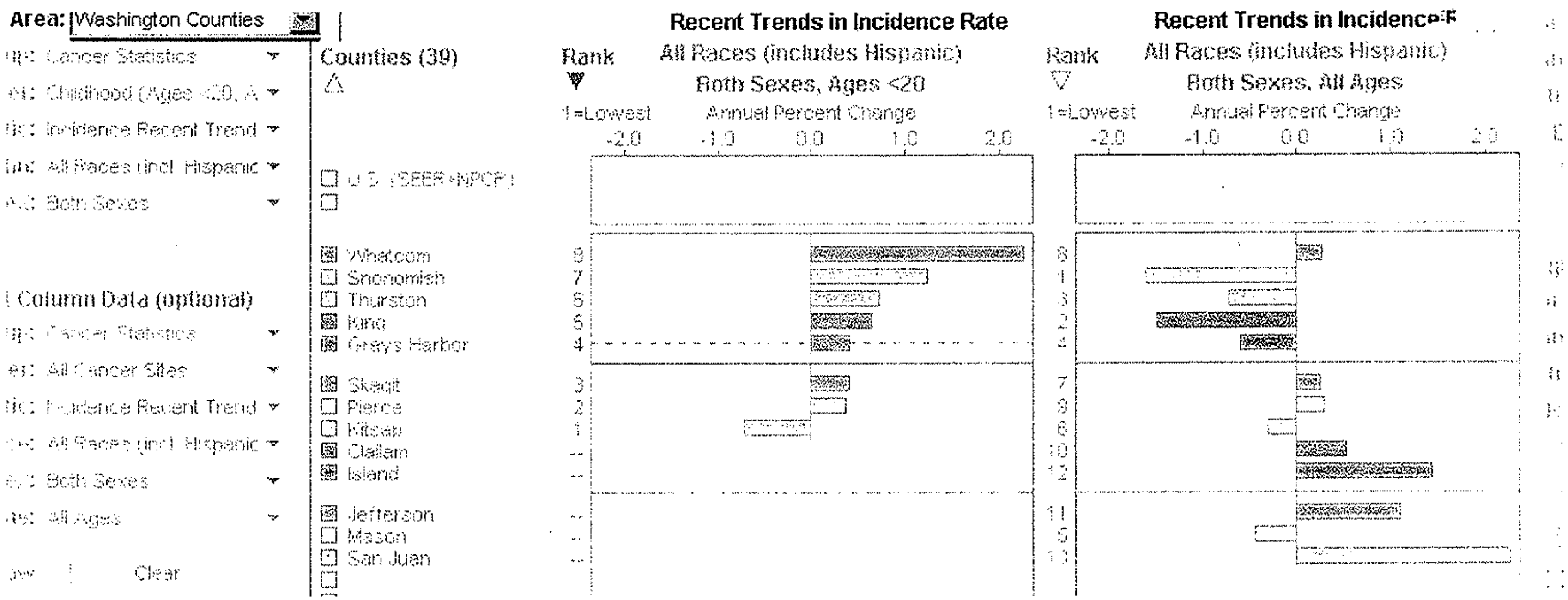
| CONSTITUENT | SAMPLE AMOUNT | SPIKE FOUND | SPIKE ADDED | PERCENT RECOVERY | RPD |
|---|---|---|---|---|---|
| Gamma Spectroscopy | | | | | |
| Date Analyzed: [illegible] | | | | | |
| Cs-137 MS | < 5.20 | 29.8 | 33.1 | 90.0% | |
| Cs-137 MSD | < 5.20 | 30.5 | 33.1 | 92.1% | 2.3% |
| Analyzed [illegible]/01/96 | | | | | |
| Gross Alpha MS | < 3.15 | 146 | 155 | 94.2% | |
| Gross Alpha MSD | < 3.15 | 150 | 155 | 96.8% | 2.7% |
| Analyzed 10/01/96 | | | | | |
| Gross Beta MS | < 3.06 | 113 | 132 | 85.6% | |
| Gross Beta MSD | < 3.06 | 126 | 132 | 95.5% | 10.9% |
| Analyzed 10/03/96 | | | | | |
| Tritium MS | < 460 | 8340 | 8510 | 98.0% | |
| Tritium MSD | < 460 | 7830 | 8510 | 92.0% | 6.3% |

Values reported in pCi/L

SPIKE CONTROL LIMITS
Percent Recovery 70 - 130 %
Relative Percent Difference < 30 %

Advisory QA Limits

FORM-III [illegible]


Area: Washington Counties
Cancer Statistics
Childhood (Ages <20, A
Incidence Recent Trend
All Races (incl. Hispanic
Both Sexes
Column Data (optional)
Cancer Statistics
All Cancer Sites
Incidence Recent Trend
All Races (incl. Hispanic
Both Sexes
All Ages
Clear
Counties (39)
U.S. (SEER+NPCR)
Whatcom
Snohomish
Thurston
King
Grays Harbor
Skagit
Pierce
Kitsap
Clallam
Island
Jefferson
Mason
San Juan
Recent Trends in Incidence Rate
Rank
All Races (includes Hispanic)
Both Sexes, Ages <20
1=Lowest
Annual Percent Change
-2.0
-1.0
0.0
1.0
2.0
9
7
6
5
4
3
2
1
Recent Trends in Incidence
Rank
All Races (includes Hispanic)
Both Sexes, All Ages
1=Lowest
Annual Percent Change
-2.0
-1.0
0.0
1.0
2.0
8
1
3
2
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10
12
11
5
13

Commenter No. | Name / Organization
---|---
54 | Fizzano, Perry

Commenter Submittals:

A E-mail dated Dec. 11, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

29

-----Original Message-----
From: perry fizzano [mailto:fizzano@gmail.com]
Sent: Monday, December 11, 2006 3:53 PM
To: McInerney, Lucy (ECY)
Subject: Bellingham Bay Cleanup

I for one would like to see Ecology do what is in the best interest of the public in terms of both health and monetary cost. Would you want
to live in an area that is above a bunch of mercury? Would you want to 30
eat shell fish from a Bay that is known to have mercury deposits? I would love to see all the mercury removed but if that is not monetarily feasible then let's dredge the waterway and cap the ASB.
The ASB was designed to contain hazardous waste and if you're going to cap something to save money then it should be the ASB that is capped and not the waterway.

Perry Fizzano

Commenter No. | Name / Organization
55 | Foster, Kevin

Commenter Submittals:

A | Comment form received Oct. 26, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Residuals and water quality | Residuals and water quality during dredging | 5.16 |
| 3 | FS | Project funding | Cleanup funding & property taxes | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

EIS | Supplemental Environmental Impact Statement
FS | Feasibility Study (Volume 2 of Supplemental RI/FS)
RI | Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS | Responsiveness Summary (Narrative)

rcvd 10/26/06 31

# Whatcom Waterway Site

WASHINGTON STATE DEPARTMENT OF ECOLOGY

## Comment Form

This is an invitation for comments on the draft Supplemental Remedial Investigation/Feasibility Study and draft Supplemental Environmental Impact Statement for the Whatcom Waterway site in Bellingham, Washington. If you wish to comment, please fold, affix postage, and mail this form to Ecology by December 9, 2006 (address on reverse).


*Name and address optional*

Name: Kevin Foster
Address: 5938 n. Star Rd.
City: Bham Zip Code: 98248
E-mail Address: www, llwvo7@aol


Plan 5d 6 seems to capture costs, jobs 33
not Disturbing already capped mercury. 30
managable taxs to the community 31

Commenter No. 56 — Name / Organization: Fredrikson, Keith

Commenter Submittals:

A Letter dated Dec. 16, 2006

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Project funding | Funding, taxes and grants | 5.26 |
| 2 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 3 | FS | Seismic stability | Stability of caps during earthquakes | 5.7 |
| 4 | FS | Wind & wave erosion | Tide and wave disturbance to cap stability | 5.3 |
| 5 | FS | Navigation disturbances | Prop wash and anthropogenic disturbances | 5.4 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

Keith Fredrikson
7516 Wheeler Road
Maple Falls, Washington 98266

December 16, 2006

RECEIVED
DEC 18 2006
DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

Lucille T. McInerney
DOE NW Regional Office
3190 160th Avenue
Bellevue, Wa. 98008

Dear Ms. McInerney,

Thank You for allowing me to comment on the RI/FS for the Whatcom Waterway Cleanup. I am very angry about the contamination and cleanup proposals for Bellingham Bay. First, because Georgia Pacific was allowed to contaminate the bay with mercury in the first place. They should have been forced to handle it as hazardous waste. Second, because they were allowed to dodge their responsibility for cleaning it up completely or even at all. Their deal with the Port of Bellingham should not have been allowed. Third, because now the public is being forced to clean up their mess for them. The Port is a public agency and the money they and their insurance company will spend is public money. Any grant money that the Department of Ecology will provide is public money. Any money above and byeond those sources will be public money. 30

We are where we are and we must find the best path forward. So here is my first comment. I want the Department of Ecology to sue Georgia Pacific to recover whatever costs are incurred for the cleanup. They are the responsible party and they should be held responsible. I know this is not likely. If the public gets stuck with the bill, then the public should own the property and should decide how to use it without interference from the Port.

My second comment is that the cleanup should be complete. The right thing to do is to get <u>all</u> the 31
mercury and phenols and other toxins out of the <u>entire</u> waterway and the ASB and the log pond.
Bellingham Bay is not and should not become a hazardous waste site. Why would the Deprtment
of Ecology ever consider placing a hazardous waste site on a shoreline in the middle of a heavily 32
populated area? There are reasons why you site landfills for both hazardous waste and solid
waste on the east side of the mountains, where it is dry, and on stable land not subject to
earthquakes and tidal and wave action and prop wash and people digging around in there in the 33
next 500 years or more. Put it somewhere where it can't harm people or the environment. GP
did not do that. We have the opportunity to do it now. 34

Thank You
Keith Fredrikson

Keith Fredrikson

Commenter No. Name / Organization
57 Friedman, Mitch

Commenter Submittals:
A Public hearing transcript excerpt

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |
| 2 | FS | Natural recovery | Concerns about effectiveness | 4.6 & 5.15 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

31

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Mitch Friedman**
Mitch Friedman, 1208 Bay Street. Not a lot remains to be said. The alternatives other than 5 and 6 – I share Heather's concern that they feel a bit like straw men. I appreciate the existence of alternative 3. It ought really to score fairly well. It removes a heck of a lot of mercury. It maximizes protectiveness it does it in a cost effective way, but because the landowner doesn't want it, it's a straw man. It doesn't give us a marina. 32

The higher alternatives, alternative 7 would remove quite a bit, but again it's based on a land use on a navigable waterway that really isn't the issue anymore. So we've got a limited set of alternatives. We don't really have an alternative based on maximizing protectiveness in the most cost efficient way.

I think what is driving this process is the sense of maybe optimism that the community doesn't share. When I say optimism it's somewhat counter-intuitive that there would be ten plus tons of mercury that would be discharged into the waterway and the bay over the last half century. Yet we wouldn't have a public health catastrophe on our hands. I don't think we really understand why we don't. We have a name for the fact that we don't have a catastrophe. We call it natural
recovery. We're not sure whether whatever condition is prohibiting the uptake of mercury right 33
now will continue into the future.

All of the things we're talking about tonight – seismic and wave action and grounded ships and tsunami's – all of these things aren't a matter of if, but when – within a lifetime of mercury. None of those things make optimism about natural recovery, about future uptake of mercury, very responsible. I don't know how we would begin to calculate the odds, the odds that mercury will not uptake under alternative 5,under a marina scenario. You know in the next 50 to 100 years are the odds 5 percent that we'll continue to enjoy an absence of mercury related diseases in an obvious way? Is it 50 percent, 95 percent, I don't think any of us know, but I do know that I presented to the director of Ecology with copies of 6400 signatures on the healthy bay initiative last week.

I know that everybody here tonight commented a great deal of concern, despite our primary sources of information being the Port and the city, that's being dragged along by the port, the *Bellingham Herald* that gives free advertising to the Port every week. They're still an extraordinary amount of concern in this community and a reluctance to just be optimistic. I hope, I'm sure that we all look to the Department of Ecology. I hope Department of Ecology comes through in putting the protectiveness of the health of this community foremost. Thanks.

| Commenter No. | Name / Organization |
|---|---|
| 58 | Fuglestad, Carol |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 18, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Project funding | Marina fees & cleanup funding | 5.26 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

From: henry [twodogz@fidalgo.net]
Sent: Monday, December 18, 2006 4:56 PM
To: McInerney, Lucy (ECY)
Subject: Whatcom Waterway

I attended the hearing on the Whatcom Waterway hearing and did not testify as I would have just said what everyone else was saying:

1) Clean up the Mercury forever.
2) First remove the mercury from the waterway, do not simply cap it in the inner waterway. 35
ANY SHORT-TERM COSTS PAY FOR THEMSELVES IN THE LONG-TERM
3) Fill the ASB or turn it into a marina, but if it is a marina use the fees to help pay off the long-term costs of the clean-up. 36

Thanks for upholding your charge and doing the right thing for the people, waters, and lands of Washington State, and not just what for a special interest group like the Port of Bellingham.

Thanks
Carol Fuglestad
4613 Willis St.
Bellingham, WA 98229

| Commenter No. | Name / Organization |
|---|---|
| 59 | Georgia Pacific |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Dec. 18, 2006 | Roger J. "Chip" Hilardes (General Manager Bellingham Operations) |

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | EIS | Land use changes | Support to land use changes | 6.6 |
| 2 | EIS | Navigation channel changes | Support for multi-purpose waterway | 6.7 |
| 3 | FS | Cap design | Capping guidance documents | 5.8 |
| 4 | FS | ASB comments | ASB sheet-piling during cleanup | 5.20 |
| 5 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

36

Georgia-Pacific

Georgia-Pacific West. Inc.

300 West Laurel Street
Bellingham, WA 98225
(360) 733-4410

December 18, 2006

Ms. Lucille T. McInerney, P.E.
Site Manager, Department of Ecology
3190 160th Ave SE
Bellevue, WA 98008-5452

RE: Whatcom Waterway Draft Supplemental RI/FS Comments

Dear Ms. McInerney,

Georgia-Pacific provides the following comments on the Draft Supplemental Remedial Investigation & Feasibility Study, Volume 2: FS Report – Public Review Draft (October 10, 2006) for the Whatcom Waterway Site:

- Overall, the FS Report is well organized and, except for extensive changes in property ownership and planned land use in and around the waterway, the basic rationale for the site is consistent with earlier RI/FS and Supplemental RI/FS documents. The changes in ownership and land use include plans to incorporate development of a marina within the ASB and to convert the inner portion of the Whatcom Waterway channel to a locally managed multi-purpose waterway. These changes have been appropriately addressed in the current documents and suggest that an adjustment to the previous proposal for site remediation is warranted." 2-K 37

- Section 5 - The entire discussion would benefit by incorporating or at least referencing updated reviews of sediment remediation technologies contained in EPA's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (December 2005) http://www.epa.gov/superfund/resources/sediment. Incorporation of the recent EPA technology screening and related information does not change the substantive conclusions presented in the document, but could improve the accuracy of the FS Report, as some of the current Section 5 discussion is no longer regarded as up to date. 38

- Section 6 – We do not believe the existing data requires the construction of a temporary sheet pile installation within the ASB berm (e.g., in Alternatives 5 and 6) to "prevent migration of impacted water through the berm during dredging. We believe the existing data demonstrates that ASB sludge or sediments have a very low leachability. This element of the project is likely to prove very expensive and would only provide limited benefits (i.e., an impracticable construction element). At this point in the process, it may be best to simply state in the document that, 39

"Subject to more detailed remedial design evaluations of the need for and cost-effectiveness of water quality controls, sheet piling may be considered . . .".

Georgia-Pacific supports Ecology's selection of Alternatives 5 and 6 as the preferred remedial alternatives for the Whatcom Waterway Site. If you have any questions please contact me at (360) 647-5695. 5

Sincerely,

Roger J. "Chip" Hilarides
General Manager – Bellingham Operations
Georgia-Pacific West Inc.

Cc: Michael Davis, Georgia-Pacific Corporation
Paul Montney, Georgia-Pacific Corporation

Commenter No. | Name / Organization
---|---
60 | Goodman, John

Commenter Submittals:

A E-mail dated Dec. 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
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- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

38

**From:** Wild Buffalo House of Music [mailto:wb@nas.com]
**Sent:** Saturday, December 16, 2006 3:13 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway cleanup

**Dear Lucy McInerney / Dept. of Ecology,**

**Regarding cleanup of the Whatcom Waterway in Bellingham, WA, the** only real solution is to remove the contaminated sediments and mercury, not bury it. I don't want the risks involved with leaving it there. We don't want to have to do this again, please. The side effects and costs of getting rid of it now far outway the long term effects and costs of leaving it in place. 39

Thank you for listening.

John Goodman - Bellingham 30 year resident, taxpayer, property owner, business owner.
1704 Fairhaven Ave.
Bellingham WA
98229
360-733-3229

| Commenter No. | Name / Organization |
|---|---|
| 61 | Gotchy, Celestine |

Commenter Submittals:

| | | |
|---|---|---|
| A | E-mail dated Dec 9, 2006 | Thomas & Celestine Gotchy |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | RI | Water quality | Concern about leachability of mercury | 4.7 |
| 3 | RI | Seafood quality | Concern about mercury in salmon & Orcas | 4.4 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#12-L

**From:** Thomas Gotchy [mailto:tellytom@msn.com]
**Sent:** Saturday, December 09, 2006 3:49 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham Bay, GP site cleanup

Lucille McInerney,

We need to remove the mercury which contaminates the Bellingham GP site, not 42
leave it buried in the sediment, where with time it will slowly leach out into Puget
Sound. Maybe I'm getting this wrong, but I thought we were trying to clean up Puget
Sound. I thought we were supposed to be doing something about levels of mercury 43
found in our salmon and Orca populations. Now is the time to clean it up, not after
more irreparable damage is done. Now is the time while it is still concerted in one
small location, not after it has dispersed through the environment and becomes 44
impossible to recover. Now is the time, not later. If it is the matter of money that is
making us hesitate from doing the right thing, now is our open window of
opportunity. Now is the least expensive time and we need to take advantage of
this opportunity while we can. Tomorrow or the day after tomorrow will be to late.

Sincerely,
Thomas & Celestine Gotchy
2911 Ellis Street
Bellingham, Washington 98225
tellytom@msn.com

| Commenter No. | Name / Organization |
|---|---|
| 62 | Gotchy, Thomas |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Nov 21, 2006 |

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | RI | Water quality | Concern about leachability of mercury | 4.7 |
| 3 | RI | Seafood quality | Concern about mercury in salmon & Orcas | 4.4 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

**From:** Thomas Gotchy [tellytom@msn.com]
**Sent:** Tuesday, November 21, 2006 1:47 PM
**To:** McInerney, Lucy (ECY)
**Cc:** Bellingham Bay Foundation
**Subject:** Remove mercury from the GP site, Bellingham Bay

Lucille T. McInerney, P.E. Site Manager
Washington State Department of Ecology
Northwest Regional Office

We need to remove the mercury which contaminates the Bellingham GP site, not leave it buried in the 1
sediment, where with enough time it will slowly leach out into greater Puget Sound. Maybe I'm getting 2
this
wrong, but I thought we were trying to clean up Puget Sound. I thought we were supposed to be 1
doing something about levels of mercury found in our salmon and Orca populations. Now is the time to clean it up, not after more irreparable damage is done. Now is the time while it is still concerted in one small location, not after it has dispersed through the environment and becomes impossible to recover. Now is the time, not later. If it is the matter of money that is making us hesitate from doing the right thing, now is our open window of opportunity. Now is the least expensive time and we need to take advantage of this opportunity while we can. Tomorrow or the day after tomorrow will be too late.

Sincerely,
Thomas Gotchy
2911 Ellis Street
Bellingham, Washington 98225
tellytom@msn.com

| Commenter No. | Name / Organization |
|---|---|
| 63 | Gregory, Raffel, L. Zapote |

Commenter Submittals:

A Letter dated Dec. 13, 2006

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | RI | Mercury concerns | General concerns about mercury toxicity | 4.2 |
| 3 | FS | Seismic stability | Stability of caps during earthquakes | 5.7 |
| 4 | FS | Wind & wave erosion | Storm & erosion disturbances | 5.3 |
| 5 | FS | Navigation disturbances | Prop wash & cap stability | 5.4 |
| 6 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

2

December 13, 2006

Lucille T. McInerney, P.E., Site Manager, at Ecology's Northwest Office
3190 160th Avenue
Bellevue, WA 98008-5452

Dear Ms. McInerney;
I am writing to express my concern about cleanup in the Whatcom Waterway and ASB.
During the last month I have attending two public meetings and I agree with the 25
members of our community who spoke up against your plan to cap the mercury 1
contaminants without serious consideration for options to remove the most contaminated
sediments. Many of those concerned citizens contributed scientific expertise and
professional experience to the roundtable. These testimonies and comments must be
considered in a thoughtful way to reflect the issue of the long- term effects for our
Bellingham regional community and marine ecosystem.

The most unsettling part of DOE's alternative cleanup choice is a disregard for life-the past,
present, and future health of all 'critters', which include us. We have been presented with
hundreds of pages of data, which supports your choice of Alternative #5 and #6 for
capping, but where is the data on the damage potential from the 10-12 tons of mercury
contamination? The entire area is being treated like a dead commodity. Where is your sense 3
of stewardship?

Here is my main question-is not even **one** life suffering the effects of mercury poisoning **one** life too many? What about the insidious effects on the 'most at-risk population?' If **your** loved ones were affected by mercury poisoning, wouldn't you be concerned? Who speaks for our little children, elderly, and future generations who may be affected by this disregard? Would you sweep toxins under the rug for your kids and call that acceptable? Just **one** child suffering from mercury toxicity-cerebral palsy type symptoms, deformity, or brain damage brings incalculable cost to our entire community.

For many years Georgia Pacific was permitted to dump unconscionable amounts of toxins
into the Whatcom Waterway. They should still be held accountable for their corporate
capers as well as the Port of Bellingham for thinking they can plunk down a marina and 1-B
multiuse downtown development on top of this toxic waste area. None of the serious
potential environmental impacts were considered by the Port-earthquakes, storms, erosion,
and shipping activities (how about those state of the art tug boats that stir up the sediments 4
in the bay)?

4

I ask- where are the **ethics** concerned in this decision making process? The Port of Bellingham's hundreds of pages of data serves only the Port's shortsighted interests. Does this reflect interest in the long-term? In our past, some businesses and governments adopted superior standards, like following the Golden Rule. Now we witness our government agencies, which are supposed to serve the public, serve it's own agenda, which is not acceptable. The Department of Ecology is not delivering on public health risks, period.

When you look out at Bellingham Bay, the beautiful waters hide the ugly monster of cart-blanche contamination. It is time for the Department of Ecology to step up responsibly and do the right thing –by requiring the removal of the most contaminated sediments, not by simply capping them. We don't need a band-aid approach to restoring Whatcom Waterway. 2

At the November 28th meeting it was insulting to have the Department of Health talking about the mercury problems from thermometers, when we have 10-12 tons sitting in Whatcom Waterway and the ASB. It is outrageous that not one shovel of toxins has been removed despite the 15 + years of DOE's numerous meetings concerning this 'cleanup'! How can your agency's inaction be justified, when every year of 'Natural Recovery' contributes to the contamination our food web? 'Natural Recovery' is a Do-Nothing strategy!

This really is a unique opportunity for the Department of Ecology to use great vision and care-one that supports and sustains the Bellingham Bay region. Why not set a fine example of exemplary responsibility? The Department of Ecology **does** have the power to do cleanup that serves the needs of its citizenry. The Port of Bellingham has demonstrated it does not respect nor consider the best options for Whatcom Waterway and the ASB. It is my hope that the Department of Ecology will carefully consider leaving a legacy instead of potential untold harm for our future generations.

Sincerely,

L. Zapote Gregory-Raffel

L. Zapote Gregory-Raffel
508 Gladstone St.
Bellingham, WA 98225

Commenter No. | Name / Organization
---|---
64 | Hammond, Garth

Commenter Submittals:

A E-mail dated Dec. 15, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: ghammond [mailto:garthart@speakeasy.net]
Sent: Friday, December 15, 2006 3:32 PM
To: McInerney, Lucy (ECY)
Subject: RE: the proposed plans for mercury containment in Bellingham

Ms. Lucy McInerney

Ms. McInerney;
I am writing to express my concern with the decision that is facing your

department. I would like to let you know that I am very strongly in favor of and committed to the complete removal of every bit of mercury we can from the bay. 1

We are both familiar with the legal and scientific information. That information alone in my opinion would indicate complete removal.

How many times have we gone the easy route or the convenient politically

expedient route to arrive at a point of crisis? From the tobacco industry to the gold mining disasters of Colorado, corporate and real estate interests urge the quick solution. What is called a compromise is really a way to keep those who can yell the loudest by virtue of owning the public forums from having to be responsible for their actions. In Bellingham once again the industry that created the mess is

off the hook and we the public are back on. Our duty to the next generations is to leave our children with the literal "grounds" to grow on.

Please think longer than the next crisis, please plan for many generations in the future. Remove the Mercury from the Bay.

Thank you,

Garth Hammond

Commenter No.     Name / Organization
65     Hass, Susan

Commenter Submittals:
A     E-mail dated Dec. 18, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Additional habitat | Favors development of shoreline habitat | 5.22 |
| | | | | |

**Notes:**

EIS     Supplemental Environmental Impact Statement
FS     Feasibility Study (Volume 2 of Supplemental RI/FS)
RI     Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS     Responsiveness Summary (Narrative)

2

-----Original Message-----
From: Charlsie Sprague [mailto:charlsiesprague@bellcoho.com]
Sent: Monday, December 18, 2006 9:08 PM
To: McInerney, Lucy (ECY)
Subject: public comment from Susan Hass

To: Lucille T. McInerney at the Department of Ecology

Thank you for your courage.

We all must commit to cleansing the area completely, and only then have public conversations about alternative ways to accomplish it. 1
The excitement from the commitment can spark a place restored with local labor that is wise for nature, full of creativity, light on the pocketbook, and respectful of the experienced Lummi Nation. I also support a change in the coastline, if people filled the area with dirt 2
and rocks. The creatures, soil, sand, and water can become a thriving habitat again, supporting culture, with thousands of years of chaos, flux, and change in the future.

Perhaps the efforts of EnviroStar dentists (here, Barkely Boulevard Dental Care and Mike Nelson) to take care of hazards in the body on a tiny scale can inspire the Department of Ecology to insist on health on this larger scale.

I imagine a handful of PUBLIC COMMENTS are intimidating in tone, content, and volume. Please listen to the patterns of the entirety of comments.

Thank you again for your courage!

Susan Hass

2628 Donovan Avenue
Bellingham 98225
360-738-7268

Commenter No. | Name / Organization
66 | Hayes, Hamilton

Commenter Submittals:

A Public hearing transcript excerpt

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Design & permitting | Public review during design process | 5.27 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

2

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Hamilton Hayes**
My name is Hamilton Hayes I'm from the Puget neighborhood. You are from the government, with no disrespect personally, but as I get into my questions. I'm a little concerned about process. So my comment is a recommendation that the design process also be subject to public
review. I know that you may consider some of us not to be technically astute. But our 3
community does have a substantial number of scientists and people in the university environment and the engineering environment that are certain to provide good technical comments.

I think given the experiences of some of the government agencies recently about construction and hydraulics that this would be something that would be very appropriate for the agency to adopt as their procedure. Thanks.

| Commenter No. | Name / Organization |
|---|---|
| 67 | Heron, Riley |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 12, 2006 |

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#4-B

-----Original Message-----
From: Riley Heron [mailto:rmhsurvey@hotmail.com]
Sent: Tuesday, December 12, 2006 9:04 AM
To: McInerney, Lucy (ECY)
Subject: Bellingham Bay Cleanup comes first

My desire is to see the highest level of cleanup possible for Bellingham's waterfront and Bellingham Bay to ensure a safe and healthy (financial and otherwise) future for current and future generations of residents. I am asking for a full removal of mercury from the marine environment of 4

Bellingham Bay and disposal of all toxic waste material in an approved upland disposal site. I believe the removal of mercury from the uplands of the site be accomplished all at once, before any construction begins. I am also not, at this point, completely convinced that the best or most "preferable" plan is currently on the table. The Department of Ecology approved plan is simply not protective enough.
Thank you,
Riley Heron
Bellingham, WA

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Commenter No. — Name / Organization
68 — Herring, Eileen

Commenter Submittals:
A — E-mail dated Dec. 18, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

4

-----Original Message-----
From: Herring/Sanders [mailto:alaneileen@verizon.net]
Sent: Monday, December 18, 2006 2:47 PM
To: McInerney, Lucy (ECY)
Subject: Whatcom Waterway cleanup

Dear Ms. McInerney;

Regarding the cleanup of Whatcom Waterway in Bellingham, I am
strongly in favor of complete removal rather than capping in place. 5
Yes, the initial cost will be higher, but it is the only method that is protective of our waterway and bay into the future. Having to go back and remove it at a later date would be much more expensive; this is our best opportunity. Do it for our kids.

Eileen Herring
Birch Bay

Commenter No. | Name / Organization
---|---
69 | Hertz, Kenneth

Commenter Submittals:

| | | |
|---|---|---|
| A | E-mail dated Dec. 14, 2006 | Debbie Turk |
| B | Letter dated Dec. 14, 2006 | Kenneth Hertz |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | EIS | Marina comments | Opposition to development of new marina | 6.8 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#5-A

**From:** Debbie Turk [mailto:debbie@blossommanagement.com]
**Sent:** Thursday, December 14, 2006 1:08 PM
**To:** 'www.lpeb461@ecy.wa.gov'
**Cc:** 'Betsy@restorationfund.org'; 'citycouncil@cob.org'; 'cgleichmann@cob.org'; 'marym@portofbellingham.com'
**Subject:** Letter from Ken Hertz re: GP Site

cc: Governor copy sent via US Mail.

Dear Lucy McInerney:

Ken Hertz asked me to email you the attached letter.

Ken's contact information is:
Ken Hertz
420 S. Clarkwood
Bellingham, WA 98225
Ph: 360-739-8315 or ken@blossommanagement.com

Sincerely,
Debbie Turk (for Ken Hertz)
360.738.8088
Debbie@blossommanagement.com

**Cheri Gleichmann**: Please provide Planning Commission the attached letter – thank you.

**Mary Matyas**: Kindly provide the Port Commissioners the attached letter – thank you.

6

# Hertz

December 14, 2006

Ms. Lucy McInerney
www.lpeb461@ecy.wa.gov
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Dear Ms. McInerny:

RE: Future Use of Georgia Pacific Site – Bellingham, Whatcom County, Washington

While the Department of Ecology and local jurisdictions assess the future of various Georgia Pacific site clean-up alternatives, it is crucial they also consider the long-term impact of proposed uses. One specific use (which is seemingly off-limits to serious discussion) is the proposed marina.

I am an avid boatman and quite familiar with various marinas in the Puget Sound and Gulf Islands. And typically…I find myself disillusioned with the polluted conditions of the marinas I visit.

A case in point, simply visit Squalicum Marina today and visible pollutants can be readily found floating upon the waters. It is a fact, that marinas generate a tremendous amount of nonpoint source pollution, no matter how controlled the area. Waste oil and spills, fuel dock operation and maintenance, bilge water discharge, pumpout facilities, boat cleaning, solid and hazardous waste disposal, (not to mention overboard pumping by unscrupulous boaters!), all have huge visible impacts on ocean waters that are a direct result of boaters.

It may seem odd for a boatman to oppose a marina, but I find it a direct contradiction in terms for a marina to be proposed for an area already environmentally compromised as is. There is no doubt that a marina at the GP site will only exacerbate the existing environmental wounds in these waters and contribute to the detriment of future water quality. Wouldn't a park make more sense for the local waters, Puget Sound and our community as a whole? 3

Hopefully, local agencies and DOE will *carefully* assess the water quality impact associated with both the initial clean-up and long-term impact of specific uses.

Sincerely,

Kenneth D. Hertz

KDH/dct

Copy: Governor Chris Gregoire, Puget Sound Restoration, Bellingham City Council, Planning Commission, Port Commission

420 South Clarkwood Drive, Bellingham, WA 98225

Commenter No. Name / Organization
70 Hirst, Eric

Commenter Submittals:
A E-mail dated Dec. 7, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
| --- | --- | --- | --- | --- |
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

**From:** Eric Hirst [mailto:EricHirst@comcast.net]
**Sent:** Thursday, December 07, 2006 6:11 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway Cleanup

Dear Lucy,

Having read the article by Murphy Evans in this week's issue of the *Cascadia Weekly*, I am now convinced that the full cleanup envisioned in Alternative 7 is the preferred choice. Although its initial costs are higher than those for Alternative 6, it promises a much higher level of environmental quality, much less long-term monitoring, and a much lower risk that additional mitigation actions will be required at a later date. I, therefore, urge the Washington Department of Ecology to adopt Alternative 7, both for its long-term economic benefits and its environmental benefits. 2

Please include this email in the record of public comments on the planned cleanup of Whatcom Waterway in Bellingham.

Thank you.

Eric

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Eric and Susan Hirst
1932 Rhododendron Way
Bellingham, WA 98229
☎ 360-656-6690 EricHirst@comcast.net

Commenter No. | Name / Organization
---|---
71 | Hutchins, Rebecca

Commenter Submittals:

A Letter dated Dec. 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | RI | Seafood quality | Concerns about mercury in seafood | 4.4 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | FS | Cost accuracy | Volumes of Waterway sediment | 5.23 |
| 5 | FS | Capping costs | Maintenance & contingent remedy costs | 5.12 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

1

December 16, 2006

Dear Ms. McInerney:

Thank you for accepting the following comments on the RI/FS for the Whatcom Waterway cleanup. I have reviewed many project-related documents and as a concerned citizen am deeply interested in the final clean-up plan.

Through the research and discussions I have participated in it is clear to me that the best option for a complete and permanent cleanup is an amended Alternative #7. It is critical to the health of our community
that dredging is completed in all places that are at a high risk of re- 13
contamination from mercury: the Inner Whatcom Waterway which is in an open environment and subject to boat traffic and rough weather, the log pond where the cap is failing, and the lagoon if it is to become a marina or other aquatic habitat. I would like to see capping at all other places that have mercury concentration above the sediment quality standard of 0.41.

My primary concern with capping the majority of the Inner Whatcom Waterway is that this is not a permanent solution. The longevity of capping is not proven and cannot be guaranteed. It is clear, however, that the mercury contamination in our bay will not degrade and will
affect the food chain in perpetuity. 14
The current level of mercury contamination in our waterway is extremely dangerous and the most conservative steps must be taken at this juncture to minimize future destruction of the environment and our community's health. Simply capping the current contamination will not provide the level of protection we should be seeking from this harmful element.

While I understand some of the dangers in dredging, I believe the technology is out there to complete the removal of this sediment in an
appropriate manner and I urge Ecology to evaluate the options to dredge 15
the sediment in the Waterway, log pond, and lagoon and to contain it in upland certified disposal site.

And finally, the cost estimates for the removal of the contamination
appear to be inflated and I urge Ecology to recalculate the actual 16
expense of these efforts. In addition when considering cost, it must be assumed that the ongoing cost of upkeep and repair of a cap will no
doubt far exceed the removal costs if calculated with realistic long- 17
term goals. Removal will clearly be more cost effective in the long run.

Thank you for considering my comments. I look forward to a clean, healthy waterway in the future of Bellingham and hope Ecology will do its best to represent these concerns and pursue the safest and most permanent options available and will reconsider its current position projected in the RI/FS.

Sincerely,

Rebecca L. Hutchins

Commenter No. | Name / Organization
---|---
72 | Ingram, Charles

Commenter Submittals:

A E-mail dated Dec 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

14

**From:** Charles Ingram [mailto:CIngram@dadco.com]
**Sent:** Thursday, December 14, 2006 3:20 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms. McInerney,

I am a Whatcom County resident that uses and views Bellingham Bay in various ways. I have reviewed the draft RI/FS and EIS documents for the Whatcom Waterway Site. I am in support of the preferred alternatives 5 and 6 as they are currently documented. Thank you for your commitment to the future of the waterfront. 15

Sincerely,

Charles Ingram
955 Marine Drive

<u>Commenter No.</u> | <u>Name / Organization</u>

73 Irving, Steve

<u>Commenter Submittals:</u>

A E-mail dated Dec 18, 2006

B Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Cleanup levels | Concerns over changing standards | 5.30 |
| 3 | FS | Log Pond | Concerns about Log Pond cap performance | 5.14 |
| 4 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 5 | FS | Capping concerns | General concerns about effectiveness | 5.2 |
| 6 | FS | Natural recovery | Concerns about continued performance | 5.15 |
| 7 | FS | Whatcom creek effects | Creek flooding and potential cap erosion | 5.5 |
| 8 | FS | Climate change | Effects of sea level rise on cap stability | 5.6 |

**Notes:**

EIS Supplemental Environmental Impact Statement

FS Feasibility Study (Volume 2 of Supplemental RI/FS)

RI Remedial Investigation (Volume 1 of Supplemental RI/FS)

RS Responsiveness Summary (Narrative)

16

YAHOO! MAIL

Print - Close Window

**Date:** Mon, 18 Dec 2006 20:30:56 -0800 (PST)

**From:** "steve helene irving" <shirvings@yahoo.com>

**Subject:** Whatcom Waterway Cleanup Plan

**To:** lpeb461@ecy.wa.gov

Lucille McInerney
Site Manager

I am in strongly in favor of removing all of the mercury in Bellingham Bay to the MCL Standard of .59 ppm. The opportunity to clean up the mess left over from Georgia-Pacific is not likely to be better than it is durring this process. The Department of Ecology has the responsibility to take care of this site and not push the decision off to future regulators. We all know that given the Human and Ecological Health effects of mercury it is too dangerous to leave in place. The regulations concerning mercury contamination in the future will be more stringent making the MTCA analysis much too short term. Capping highly contaminated sites is too risky and short term as we found out by failure of the log pond cap in less than 5 years. Five years is a whole lot less than forever which means that the only thing we can count on forever is more contamination and expenses that are not adequately examined in the MCTA analysis. 17 18 19

At a minimum we need to remove the mercury in any area that is above the Minimum Cleanup Level of .59 ppm. This includes the log pond, the ASB lagoon, the South West corner of the ASB, and the inner Whatcom Waterway. Additional testing must be done at the Starr Rock area and the Head of the Whatcom Waterway along with mercury removal as warranted. 20

Governor Gregoire calls for $220 million to be spent in the next two years with $9 billion between now and 2020. Bellingham Bay cleanup should be an example of the new cleanups not the last of the old cleanups.

Steve Irving
2664 Brown Road
Ferndale Washigton 98248

360-384-1618

21

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Steve Irving**
I think just about everything I was going to say has already been used but I'll just repeat it. I think that the Whatcom Waterway, the ASB, the Log Pond, the SW corner of the ASB and all of the other identified hot spots for mercury should be cleaned up. I think we have one good chance of getting mercury out of the bay and it's right now during this process. If we miss this chance, we probably won't get another good one, we probably will never get another one.

We all know that mercury bioaccumulates we know that is bad. I'd like to believe in the caps but I just can't. Most of the reasons are just all the things that people have brought up. And I just kind of wrote down some of them that I had already thought of. I don't want to take credit for all of them.

All of them seem to be pretty short term to me. We can't even, we won't know what it is going
to happen. We won't even know what is going to happen ten years from now, let alone 500
years. We should do this the best way we can. For the reasons that have already been said; storm
surges, tsunamis, earthquakes, and somebody mentioned the Nooksack sedimentation that will
keep the cap on. We've got to remember the Nooksack changes course. It hasn't done it in our 22
lifetime but sometimes it goes on one side of Gooseberry Point and sometimes it goes on the
other one. On big storm surges it's come close sometimes to go out the other way. If it goes the
other way you're going to lose all of that sedimentation. You know, right were we're using this 23
is going to cap it, well maybe it isn't, maybe the Nooksack is going to go the other way.

I would like to add two more, well actually I wrote two more, but somebody already took one of
them. One of the things that really gets me with the Whatcom Waterway is that we have a big
creek coming through there and people have stood on the creek during a storm – there's a lot of
water coming down that thing. You get all that water with the low tide you're going to get 24
cutting down on that creek.

The other one was the global warming, if some predictions that have been made for what our
future is going to look like as far as sea level. That's going to change what we're planning for 25
Capping isn't going to work because you are going to have much higher water levels. So, that's
fine.

Commenter No. Name / Organization
74 James, Paul

Commenter Submittals:
A E-mail dated Dec 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Cleanup levels | Concerns about changing cleanup levels | 5.30 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

23

-----Original Message-----
From: Paul James [mailto:Paul.James@wwu.edu]
Sent: Saturday, December 16, 2006 8:49 PM
To: McInerney, Lucy (ECY)
Subject: Whatcom Waterway Cleanup

Lucille T. McInerney, P.E., Site Manager Department of Ecology, Northwest Regional Office 3190 160th Avenue Bellevue, WA 98008-5452

Dear Ms. McInerney,

I am writing in regards to the cleanup of the Whatcom Waterway here in my community, Bellingham, Washington. It is essential that we clean up all of the waterway to the accepted standard of 0.59 parts per million of mercury contamination. This must include the aeration basin 24
(ASB) and all low lying areas that were originally part of the Whatcom creek estuary. This is to insure the safety of ourselves and our children. In the past 50 years our knowledge of the effects of mercury on human health and ecology has dramatically increased. In my parents generation liquid mercury was at times played with as a toy by young people. Since that time it has been removed from most common uses such as thermometers and more recently removed in picogram amounts from childhood vaccines. That is because we are beginning to understand the impact of this heavy metal on nerve cell development, a fundamental component of human life from movement to intelligence. Over this period environmental standards have also been reduced, and it is likely that environmental standards will continue to decrease in the future. 25

Right now we have the opportunity to clean up the GP site to the current standards, an accountable public agency owns all of it, and there are resources available in part because the area is relatively valuable. In the future this will not be possible. It will be owned by a variety of entities and the cost of clean up may be prohibitive. It is essential that the Department of Ecology support the will of the people of our community and comply with the conservative interpretation of the law stating that all of the aquatic GP site be cleaned up to the current standard of 0.59 ppm for mercury. The long term benefits will
far outweigh the current costs and in addition to mercury, moving this 7-B
sediment to an upland storage facility suited for waste disposal will effectively remove the other harmful contaminants present in this area.

When I was a child the beaches of Bellingham Bay were dead, barnacles and kelp could not even grow in many areas. In the past ten years I have watched the aquatic life here rebound, from barnacles, kelp, mussels and fish to crabs, seals, otters and eagles. It is essential that we preserve this trend by enforcing current ecological laws to the best extent possible. I know that law is really an interpretive art rather than a science, so in your interpretation please err on the side of our children and the future generations that will live in this environment that we have contaminated. Right now we have the opportunity to do it right. Please do your part.

Paul James
409 Donovan Ave
Bellingham, WA 98225

| Commenter No. | Name / Organization |
|---|---|
| 75 | Johnson, Tip |

Commenter Submittals:

| | |
|---|---|
| A | Written comments dated Dec 11, 2006 |
| B | Sketch of remedy proposal (undated) |
| C | E-mail dated Dec 17, 2006 |
| D | Written comments dated Nov. 17, 2006 |
| E | Public hearing transcript excerpt |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | RI | Non-sediment mercury | GP historical use/emissions of mercury | 4.18 |
| 2 | RI | Non-sediment mercury | GP historical use/emissions of mercury | 4.18 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | FS | Capping concerns | General concerns about cap effectiveness | 5.2 |
| 5 | EIS | Alternative ASB uses | Use of ASB for wastewater treatment | 6.9 |
| 6 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 7 | FS | Additional habitat | Favors habitat development with new CAD | 5.22 |
| 8 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 9 | RI | Mercury methylation | Concerns about potential methylation | 4.8 |
| 10 | RI | Non-sediment mercury | GP historical use/emissions of mercury | 4.18 |
| 11 | FS | Capping concerns | General concerns about cap effectiveness | 5.2 |
| 12 | EIS | Alternative ASB uses | Use of ASB for wastewater treatment | 6.9 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

COMMENTS ON THE DRAFT SUPPLEMENTAL EIS & RI/FS – WHATCOM WATERWAY
Tip Johnson
11 Dec 2006

The plan before us tonight is, in my opinion, a hazard to the people of Whatcom County. It continues a fraud and deception begun in 1965 Before we accept a plan that purports to clean anything up, we should first answer the question, "Where is the missing mercury?" Absent this information, this plan could be nothing more than a cover-up and regulators may be lying to the people. That's not their job

Step back to 1959. Scientists then concluded that mercury was the cause of tragic health consequences in Minimata, Japan. Six years later, in 1965, regulators here were writing permits for G-P's facility Bellingham Bay was then the site of extensive oyster farms. Company officials testified the farms would come to no harm See any oyster farms now? Scientists already knew the plant would pose a threat to human health and the environment, but nothing was done to prevent it being started just upwind of our population, water supply and agricultural lands.

A few years later, officials in the U.S. and Canada started removing some thirty such facilities throughout the Great Lakes basin, where elevated mercury levels had been found in fish tissue Sound familiar? But G-P's plant would operate for another twenty five years, spewing tons of the most dangerous, persistent, bio-accumulative neuro-toxin all over Whatcom County A three year air quality study of downtown Bellingham would be conducted without once checking for mercury.

Dave Franklin, former G-P General Manager, after years of badgering, told the City Council that at least 15 tons of mercury needed to be added to the plant each year. That totals nearly 600 tons over their term of operation, a figure supported by industry standards of mercury used per ton of product produced. G-P admits to only 15 or twenty tons in the bay. Where's the rest of it?

We can only speculate DOE won't ask for an accounting. A couple hundred tons were probably vaporized from the cell house into the atmosphere downtown. They dumped contaminated sludge along the shores of Whatcom Creek – a popular juvenile fishing stream. They illegally buried fifteen tons on their property. DOE made them pave over it Untold quantities were roasted in the first Mercury Recovery Unit. G-P found it very effective at removing mercury, but admitted none was being recovered. DOE urged them to keep trying No one knows how much was dumped in gravel pits and ravines to "go away". When DOE asked them to stop dumping, G-P "respectfully refused". DOE let them continue The fate of this mercury is crucial to any real plan. G-P were masters of go-away toxic management and that influence is duly noted in this plan. 7-B

G-P attended the infamous meetings of the Chemical Industry Association that Bill Moyers later exposed as a widespread conspiracy to avoid disposal regulations by packaging waste as products. For instance, G-P made a drilling mud for the oil industry. Now mercury hotspots appear around offshore platforms. We know G-P also sold a similar product to their forestry divisions as a dust suppressant for use on logging roads. We don't know what was in it. But we do know that G-P accepted hazardous waste from Boeing and others, as far away as Ketchikan. Why is this important?

Because depending on the fate of their mercury, this is either a least-cost, do-nothing plan that is horribly irresponsible to the public's health - or a deliberate attempt to hide the problem and escape liability for an environmental health disaster.

Here's the lie. The plan hinges around two bogus theories, Capping and Natural Recovery. Together with the missing mercury, they provide a mask and shield to hide the effects of G-P's work and DOE's regulation. Natural Recovery just means it goes away. A clean cap is the shield that they hope will limit releases to rates and levels indistinguishable from relatively high levels of mercury entering the bay via the Nooksack River.

tip@skookum.us / 2719 Donovan Ave., Bellingham, WA ~ USA / Tel +1.360 733 9211 / Fax +1.206 350.3664

But why are background levels so high? G-P and regulators have often suggested that cinnabar deposits high in mercury are common to volcanic areas. But no one has actually identified the deposits What if, instead, it is the tons of mercury spewed into the air, dumped willy-nilly and sprayed on logging roads throughout the watershed? In that case, background levels are the mask that allows this plan to exploit past wrongs and continue them into the future while avoiding costs and responsibility That's wrong. 26

DOE has a conflict of interest and is not acting in the public's best interest They should step aside and ask the EPA to step in This plan is nonsensical and some very important public interests are about to be needlessly squandered. DOE should put these interests in perspective, not just pander to whatever authority is willing to overlook their liability

The theory of Natural Recovery has a problem. Mercury is persistent and bio-accumulative. It degenerates brain neurons. It is highly mobile. It should not be left loose in the environment. It should go away only to approved repositories. Placing clean sediment is fine, but contaminated sediments should first be removed, treated and properly disposed.

Capping is unproven. The Log Pond cap already suffers from erosion despite its protected location. Caps are doomed to fail even as a function of their success. Eventually, roots and burrows will penetrate the cap and recovering populations will become feeding targets. Uptake and mixing will distribute the toxins. That's no way for mercury to go away. 27

The success of Governor Gregoire's recently announced restoration of Puget Sound's nearshore habitat will increasingly rely upon treating urban run-off. Why would DOE entertain a proposal that eliminates our treatment capacity when they are likely to mandate additional treatment requirements? That doesn't make sense and will cost us plenty. Where will we replace it?

And where will industry treat their process water? Does DOE, the Port or City believe we no longer need industry? Even clean industry needs water. Without treatment capacity, what use will we gain from the large industrial water supply already provided to the waterfront? That's economic waste. 28

This evolution of Alternative K is a plan born of predisposition toward the Port's particular purposes. Those purposes are narrow and not in the public's best interests. DOE, or their successors in this process, should revisit the Contained Aquatic Disposal option already approved by our Legislature. We can build a better marina, maintain shipping capacity, safely reposit our contaminated sediments, retain treatment capacity for industry and urban run-off, and protect our restoration efforts from future pollution. Please comprehensively integrate and prioritize these public interests. 29

Please also advance a plan that accounts for the missing mercury and protects the public.

Thank you.

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Please incorporate by reference:

- Special Report #32, An Oceanographic Survey of the Bellingham-Samish Bay Systems, University of Washington, Department of Oceanography, March 1966, and

- The video entitled "How Mercury Causes Brain Neuron Degeneration", Department of Physiology and Biophysics, Faculty of Medicine, University of Calgary, 2000 (available online).

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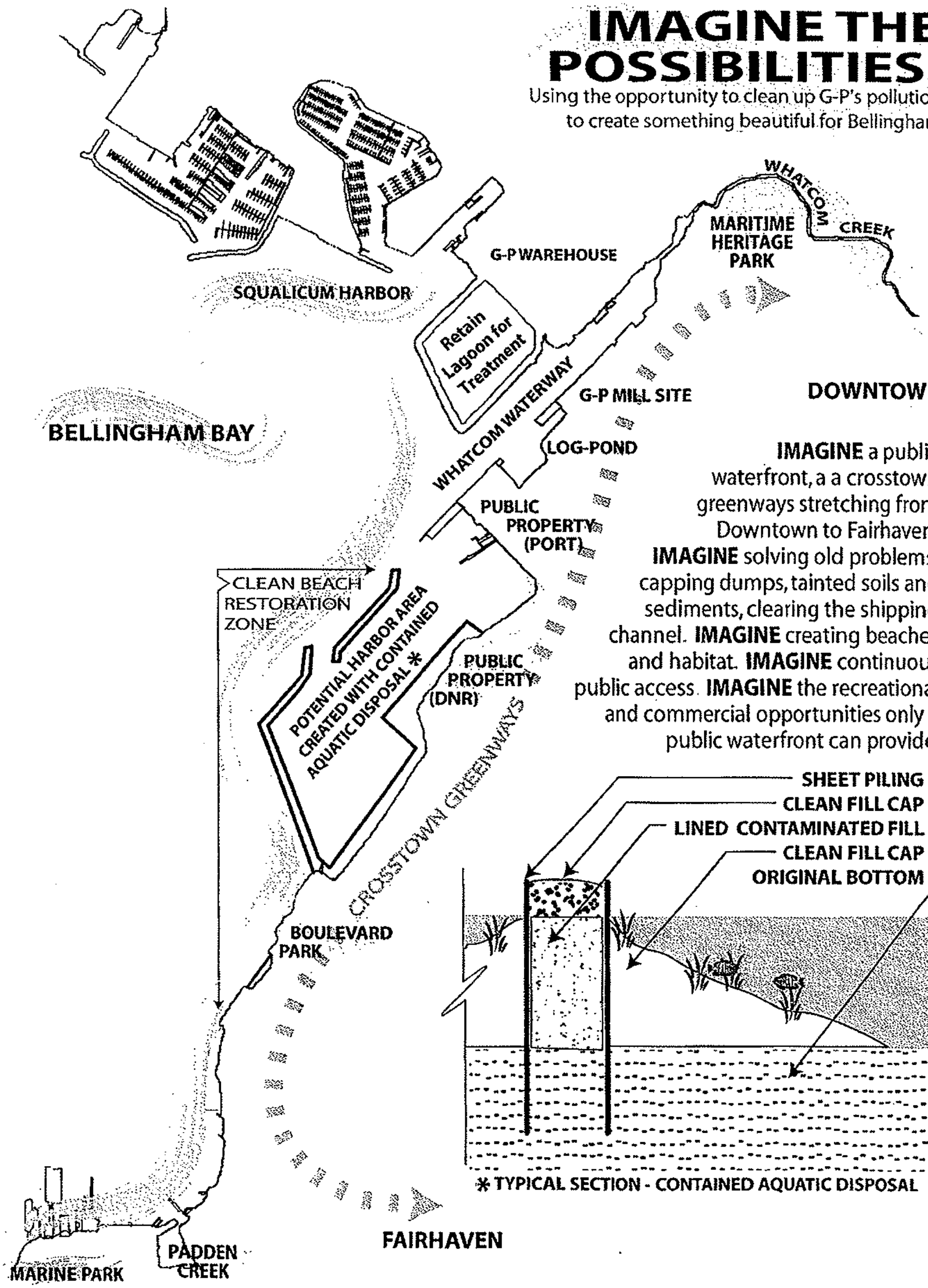
# IMAGINE THE POSSIBILITIES!

Using the opportunity to clean up G-P's pollution
to create something beautiful for Bellingham




**IMAGINE** a public waterfront, a a crosstown greenways stretching from Downtown to Fairhaven. **IMAGINE** solving old problems: capping dumps, tainted soils and sediments, clearing the shipping channel. **IMAGINE** creating beaches and habitat. **IMAGINE** continuous public access. **IMAGINE** the recreational and commercial opportunities only a public waterfront can provide. 31

32

* TYPICAL SECTION - CONTAINED AQUATIC DISPOSAL

-----Original Message-----
From: Tip Johnson [mailto:tip@skookum.us]
Sent: Sunday, December 17, 2006 8:44 PM
To: McInerney, Lucy (ECY)
Subject: Supplemental Comment on the Draft Supplemental EIS & RI/FS - Whatcom Waterway

Thanks!

Tip Johnson
2719 Donovan Avenue
Bellingham, WA 98225 USA
Tel +1.360.733.9211
Cel +1.360.255.1200
Fax +1.206.350.3664
tip@skookum.us

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Please include these posts from www.nwcitizen.us. They detail the difficulty citizens may have had acquiring information about this public hearing. I believe the public participation was dreadfully attenuated by a lack of outreach, bad information, severe weather and changing tims and venues or the proceeding. The hearing should be held again.

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**Mon, Nov 27**

**Public Process - Lots of it (kind of), or**
**I lied (sort of!)**

In the previous post I complained that the biggest rip-off in Whatcom County history was happening without even being discussed or making it into the news. Well, I lied. Today it is in the news, sort of. (This last link will expire at the Herald, so I am posting the info here:

*The state Department of Ecology has scheduled a public hearing Tuesday on the draft cleanup study and environment impact reports for the Whatcom Waterway site. At the hearing, people can provide oral and written comments. The hearing is scheduled for 5:30 to 8:30 p.m. at Bellingham Municipal Court, 2014 C St. The public is encouraged to review the documents and comment to the department by Dec. 9.*

We emphatically thank the Herald! Why? Because you probably wouldn't otherwise know about the hearing or the December 9th deadline for written comment.

We went to the website for "New Whatcom". The following information can be found there:

*Two Department of Ecology public meetings to hear public comment on the plan to clean up the Whatcom Waterway: 6:30 - 8:30 p.m., Thursday, November 30th at Bellingham Municipal Court, 2014 C Street*

They curiously mention two meetings, but list only one. Also, it is well known to denizens of the political cesspool that "meetings" do not a "public hearing" make. Public hearings are designed to accept testimony and create a public record. Meetings are merely a chance for citizens to vent while officials pretend to listen. They do not create a legal record for a public proceeding as does a public hearing.

We looked into the link on the New Whatcom site for "Public Involvement", but found only a recitation of all the meetings they have already had. Regardless of whether the public has the information they need to actually participate in the process, officials will at least be able to say they had a lot of meetings.

Incredibly, we found another link to "calendar" lower down in the body of the text. With amazement, we found one of two public meetings listed, but no information on the public hearing or the December 9th deadline. Hmmm.

Undaunted, considering ourselves resourceful as all get-out, we followed links from that page to the Port's website. After all, it's really their project. On the homepage, we found a link to "Latest Development News". Here there was, once again, nothing on the public hearing, nothing on the public meeting and nothing on the December 9th deadline. However, there is a tremendous volume of materials regarding the successful lawsuit against the citizen-sponsored "Healthy Bay Initiative". Port officials seem pround of their ability to thwart the public's will by preventing them from voting on it. Oh boy, that's democratic!

Even more remarkably, there was a link to a Department of Ecology document with information on one of the public meetings mentioned at the New Whatcom website, a sidebar with the December 9th deadline, but nothing on the public hearing.

WIthout discouragement, we found another link, under "Waterfront Redevelopment" that pointed to "Whatcom Waterway". Since that is the subject of the hearing, we must have struck paydirt by now!

Nope! Here there is even more about suing citizens, including copies of the legal complaints, the summons, responses from the Port and declarations by their Environmental Director. The public hearing and meetings would be long over by the time you finished reading it all!

Now, feeling as if we must be doing something wrong, we looked very closely. Aha! Once again, lower down in the bottom of the text, it says, *"To learn more about master planning efforts for this area, click here."* In typical government run-around style, this merely takes us back to the New Whatcom site whence we came.

Now we are feeling a little put out. We've spent quite a bit of time without even starting to read the relevant documents (plus this post is getting longer than I like). We've run out of options - except the Department of Ecology (sometimes referred to as the Department of Apology for their habit of issuing permits to pollute - like G.P.'s mercury cell facility - and their usual failure to require compliance with regulations - like G.P. taking a hike at the public's expense).

Finally, paydirt!

The following information is posted there:

PUBLIC HEARING TIME and LOCATION
Tuesday, November 28, 2006; 5:30 PM ñ 8:30 PM (Public Hearing), Bellingham Municipal Court, 2014 C Street, Bellingham, WA

DOCUMENTS FOR PUBLIC REVIEW
The draft Supplemental RI/FS and draft Supplemental EIS are available for review at the following locations:
Bellingham Public Library, Main Branch, 210 Central Ave., (360) 676-6860, Bellingham
WA Department of Ecology, Bellingham Field Office, 1204 Railroad Ave. #200, (360) 738- 6250, Bellingham
WA Department of Ecology, Northwest Regional Office, 3190 160th Ave. SE, (425) 649-7000, Bellevue, WA 98008
Ecologyís web site: http://www.ecy.wa.gov/programs/tcp/sites/whatcom/ww.htm

Taking the above link to Ecology's website, we finally found reference to both public meetings mentioned on the New Whatcom site. One of them passed on October 26th. The other is scheduled for:

November 30th, 6:30 p.m. ñ 8:30 p.m., Bellingham Municipal Court, 2014 C Street, Bellingham, WA

It's a bit remarkable that none of it is available on either local project website. Almost like they really don't want folks to come. But, finally, here is where you can find all the information you need to make a sensible comment! But you better get busy, because - look - there's quite a bit to consider!

If it is starting to look like a snow job, or aptly for our weather, a veritable blizzard, remember, this is how our government employees legitimize their fine salaries and benefits. What's missing is how we assure that the taxes we spend are working for us - ask the thousands of citizens that wanted to vote on whether to clean it up vs covering it up. Oh well, here comes the snowstorm:

(Links to documents at ecy.wa.gov have been omitted)

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**Thurs, Nov 30**

**Notice:**

Relative to the last post:

Ecology has rescheduled the public meeting for:
December 7th, 6:30 p.m. ñ 8:30 p.m., Bellingham Cruise Terminal, 355 Harris Avenue, Bellingham, WA

Ecology has rescheduled the public hearing for:
December 11th, 5:30 p.m. - 8:30 p.m., Bellingham Municipal Court, 2014 C Street, Bellingham, WA

**Mon, Dec 11, 2006**

**Moving Target**

On of the more momentous public hearings in Bellingham's history appears to be ready to pass with more than the ordinary confusion. We wrote about some of the mis/disinformation earlier.

)n the eve of one of the most important decisions for Bellingham's future, it is now unclear just where the hearing on Whatcom Waterway cleanup will be held. It is scheduled for this evening, Mon, Dec 11, but there is confusion as to whether it will occur at the Cruise Terminal or at the Municipal Court.

Shannon Sullivan of Ecology is telling the press to ignore the websites and that the hearing is at the court site. City and the DOE websites say the Cruise terminal.

http://www.newwhatcom.org/ws-doe-meetings.htm

http://www.ecy.wa.gov/programs/TCP/sites/whatcom/ww.htm

Wendy Steffensen, of ReSources, has sent out a notice to her mailing list today saying the Muni Court and says Shannon told her so.

The Whatcom Independent says Muni Court - and that means they probably got a fax. On Nov 29 the City had no idea where it would be held - less than 2 weeks before the hearing. The Indy on Nov 30 said the site would be announced later.

How much later? Hopefully the City and DOE will update their sites to include the correct info. But as of this moment, there are conflicting stories and it is anybody's guess.

All this is so familiar to any citizen activist. Bureaucrats will whine that it was an honest mistake. And citizens don't show up because they don't know when or where or why. It happens again and again.

So - where should you go at 5:30 pm this evening - as the two sites are several miles apart? Nobody knows. And what do people do who go to one of these places and it is simply closed and dark? Is it just too bad for folks who take transit or walk or bike? It's a long way to the other venue. That's public participation! Again and again and again!

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Please also include reference to these documents which pertain to Ecology's assertion that mercury left in the waterway will not methylate: 31

"The Formation and Destruction of Methylmercury by Bacterial Processes"

R.S. Oremland, USGS

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"Accumulation of Mercury in Sediment"

Edward B. Swain, et al

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"Global Mercury Cycling and the Historical Record"

D. B. Porcellaepri, et al

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« Interactions of Dissolved Organic Carbon and Mercury"

George Aiken, USGS

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"CERP Monitoring and Assessment Plan, Part 1
South Florida Mercury Bioaccumulation Module"

Especially Figures 3-73, 3-75 and Section 3.6.2.2

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"U.S. Geological Survey Open-File Report 00-449"

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"Influence of sulphur cycle on mercury methylation in estuarine sediment (Seine estuary, France)"

NIESSEN S., et al;(ELICO, UMR 8013 du CNRS, Laboratory for Marine and Analytical Chemistry

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"Sediment microbial community composition and methylmercury pollution at four mercury mine-impacted sites"

BATTEN K. M.; SCOW K. M.; Department of Land, Air, and Water Resources, University of California, Davis

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"Mercury Methylation from Unexpected Sources: Molybdate-Inhibited Freshwater Sediments and an Iron-Reducing Bacterium"

Fleming, et al; Section of Microbiology and Department of Civil and Environmental Engineering, 2005

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"Behavior of mercury in the Patuxent River estuary"

J.M. BENOIT, et al; The University of Maryland, Center for Environmental and Estuarine Studies, 1998

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"Leaching, Transport, and Methylation of Mercury in and around Abandoned Mercury Mines in the Humboldt River Basin and Surrounding Areas, Nevada"

John Gray, USGS, 2003

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'Methylmercury in Estuarine Sediments"

Anders Andren, et al, Oceanography Department and the Marine Laboratory, Florida State University

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"Organic Material: The Primary Control on Mercury Methylation and Ambient Methyl Mercury Concentrations in Estuarine Sediments"

Lars Lambertsson and Mats Nilsson, 2005

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"The Response of Methylmercury Concentrations in Fish to a Reduction in Hg Emissions: The Importance of the Watershed"

Dr. Andrew Heyes, Chesapeake Biological Laboratory, 2006

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"Mercury methylation in aquatic systems affected by acid deposition"

Cynthia C. Gilmour and Elizabeth A. Henry, Benedict Estuarine Research Laboratory, 1990

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"Concentration, Distribution and Bioavailability of Mercury and Methylmercury in Sediments of altimore Harbor and Chesapeake Bay, Maryland, USA"

Robert P. Mason and Angie L. Lawrence, University of Maryland, Center for Environmental Science, Chesapeake Biological Laboratory, 1998

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**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Tip Johnson**
Tip Johnson, I live in the Happy Valley neighborhood and I too have been involved with Georgia Pacific for a long time and other environmental matters as well. I'm going to paraphrase my comments tonight because they're kind of long and just cut me off when you will.

I hinge around where is the missing mercury? I don't know how we can have a plan until we identify where the mercury is. We don't know if the 25 holes you guys punched which John says you didn't punch in the right place. We don't know if there are big puddles down there in the waterway or if there are maybe 500 or 600 tons of mercury working their way back to the bay from wherever they landed when they were volatilized from the plant downtown.

I don't know how we can have a plan without that information. Let's just step back. In 1959
scientists concluded that the tragic health effects in Minimata, Japan were due to mercury 33
releases into the bay. In 1965, 6 years later, we started writing the permits for this plan. About, just a few years later in the mid to early 70s federal officials of the United States and Canada started removing 30 such facilities in the Great Lakes Basin because of elevated fish tissue levels in the Great Lakes.

This plant continued to operate for another 25 years. If you use industry standards for the amount of mercury generally used per pound of pulp produced or ton of pulp you'll come up with a number roughly 600 tons of mercury. That correlates to the figure Dave Franklin, the former plant manager, gave me of 500 tons. Or 15 tons per year they had to add. So GP admits to maybe 20 tons in the bay.

Where is the rest of it? I mean I don't know how we can have a plan without knowing where the rest of it is. Well a couple of hundred tons were probably vaporized from the cell house into the atmosphere downtown. They dumped contaminated sludge along the shores of Whatcom Creek, a popular fishing stream. They illegally buried 15 tons on their property. Untold quantities were roasted in the first mercury recovery unit. GP found it very effective at removing mercury, but admitted none of it was being recovered. DOE urged them to continue trying.

How much of that is downwind in the watershed? I'm going to cut to the chase here because we know that GP attended the infamous meetings of the Chemical Industry Association. Bill Moyers later exposed as a widespread conspiracy to avoid disposal regulations by packaging waste as products. For instance GP made a drilling mud for the oil industry. Now mercury hotspots appear around offshore platforms. They made a similar product for their forestry division as a dust suppressant for logging roads. We don't know what was in it but we do know they accepted hazardous waste from Boeing and others as far away as Ketchikan.

Depending on the fate of that mercury, in my opinion, this plan is either very poorly conceived and seriously irresponsible of the public's health by being least cost and do nothing. Or it's a deliberate attempt to hide the problem and escape liability for an environmental health disaster.

I think I see that the plan hinges around two bogus theories, capping and natural recovery. Together with the missing mercury they provide a mask and shield to hide the effects of GP's work and DOE's regulation. Naturally, natural recovery just means it goes away. With mercury that's not OK.

A clean cap is the shield that they hope will limit releases to rates and levels indistinguishable from relatively high levels of mercury entering the bay via the Nooksack River. Why are those levels so high? The cinnabar deposits that GP was fond of suggesting were the cause have really never been located. And if it really is the mercury that was spewed upwind coming back down then in that case it's a mask. To continue wrongs of the past into the future and avoid the costs and liabilities and I think that is wrong.

Natural recovery is a problem. With mercury it doesn't count, forget about it. Capping is unproven. Even if they're successful they are going to fail because roots and burrows will 34 penetrate, the populations recovering on the caps will become feeding targets, uptake and mixing will distribute the toxins. With mercury that's not OK.

**Moderator**
Sir, you have about a minute left.

**Tip Johnson**
Thank you. The success of Governor Gregoire's recently announced restoration of Puget Sound's nearshore habitat will increasingly rely upon treating urban runoff. Why would DOE entertain a proposal that eliminates our treatment capacity when they are likely to mandate 35 additional treatment requirements? That doesn't make sense and will cost us plenty. Where will we replace that treatment capacity and where will industry treat their waste? Do we no longer need industry? Even clean industry needs water treatment.

In closing, I think this plan is born of a predisposition to accommodate the Port's land use. And you kept coming back to that point. And you guys are acting as a consultant to a developer essentially and that's not in the public's best interest. We can build a better marina, maintain our shipping capacity, safely deposit our contaminated sediments, retain treatment capacity for industry and urban runoff and protect our restoration efforts from future pollution. But we need to comprehensively integrate and prioritize these public interests and we need your help to do it, because the Port is not going to and I have even submitted a diagram of how I think it can be done alternatively so thank you.

Commenter No.    Name / Organization
76    Jones, Scott

Commenter Submittals:
A    E-mail dated Dec. 17, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Capping concerns | General concerns about cap effectiveness | 5.2 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | FS | Cost accuracy | Sediment volumes in waterway | 5.23 |
| 5 | FS | Capping costs | Maintenance & contingent remedy costs | 5.12 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

35

-----Original Message-----
From: Scott Jones [mailto:okoboji1@yahoo.com]
Sent: Sunday, December 17, 2006 6:54 PM
To: McInerney, Lucy (ECY)
Subject: Whatcom Creek Waterway Mercury Cleanup

December 17, 2006

Dear Ms. McInerney:

Thank you for accepting the following comments on the RI/FS for the Whatcom Waterway cleanup.

Through the research and discussions I have participated in it is clear to me that the best option for a complete and permanent cleanup is an amended Alternative #7. It is critical to the health of our community that dredging is completed in all places that are at a high risk of re-contamination from mercury: the Inner Whatcom Waterway which is in an open environment and subject to boat traffic and rough weather, the log pond where the cap is failing, and the lagoon if it is to become a marina or other aquatic habitat. I would like to see capping at all other places that have mercury concentration above the sediment quality standard of 0.41. 36

My primary concern with capping the majority of the Inner Whatcom Waterway is that this is not a permanent solution. The longevity of capping is not proven and cannot be guaranteed. It is clear, however, that the mercury contamination in our bay will not degrade and will affect the food chain in perpetuity. The current level of mercury contamination in our waterway is extremely dangerous and the most conservative steps must be taken at this juncture to minimize future destruction of the environment and our community's health. Simply capping the current contamination will not provide the level of protection we should be seeking from this harmful element. 2-K

While I understand some of the dangers in dredging, I believe the technology is out there to complete the removal of this sediment in an appropriate manner and I urge Ecology to evaluate the options to dredge the sediment in the Waterway, log pond, and lagoon and to contain it in upland certified disposal site. 37

And finally, the cost estimates for the removal of the contamination appear to be inflated and I urge Ecology to recalculate the actual expense of these efforts. 38
In addition when considering cost, it must be assumed that the ongoing cost of upkeep and repair of a cap will no doubt far exceed the removal costs if calculated with realistic long-term goals. Removal will clearly be more cost effective in the long run. 39

Thank you for considering my comments. I look forward to a clean, healthy waterway in the future of Bellingham and hope Ecology will do its best to represent these concerns and pursue the safest and most permanent options available and will reconsider its current position projected in the RI/FS.

Sincerely,

Scott Jones

Lettered Street Neighborhood
Bellingham

Commenter No. | Name / Organization
77 | Jorgensen, Donald

Commenter Submittals:
A E-mail dated Dec. 15, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | EIS | Marina comments | Favors development of small boat facilities | 6.8 |
| 2 | EIS | Marina comments | Favors development of new marina | 6.8 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#12-K

**From:** donjorgensen JORGENSEN [mailto:donjorgensen@msn.com]
**Sent:** Friday, December 15, 2006 4:52 PM
**To:** McInerney, Lucy (ECY)
**Cc:** Steve Moore
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms McInerney,
I am a Whatcom County resident and small buisness owner that is a member of the Bellingham Yacht Club. I race in Bellingham Bay from April to November. I own a 40 foot sailboat and would like to own a dingy that could be kept at a community location with easy water access. I believe that the waterfront development should provide water oriented activity opportunities by housing a large covered storage for small nonmotorized boats under 18 feet in length ranging from kayaks to catamarans with hand trailer access to the water. One possible port property that might work would be the old plywood factory on the north side of the bay. I also think that enlarging the marina in the lagoon will help the small service businesses that work with the boating community. 37 38
I have reviewed the draft RI/FS and EIS documents for the Whatcom Waterway Site. I am in support of the preferred alternatives 5 and 6 as they are currently documented. 39
Thank you for your attention.
Sincerely

Donald A Jorgensen
777 Jorgensen Place
Bellingham WA. 98226
360-398-8906

Commenter No.   Name / Organization

| Commenter No. | Name / Organization |
|---|---|
| 78 | Karlburg, Doug |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 18, 2006 |
| B | E-mail dated Dec. 18, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | RI | Additional data collection | Additional core sampling | 4.10 |
| 2 | RI | Additional data collection | Additional core sampling | 4.10 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | FS | Sediment dewatering | Use of ASB for sediment dewatering | 5.17 |
| 5 | FS | Future sediment treatment | Temporary storage with future treatment | 5.18 |
| 6 | FS | Sediment dewatering | Use of ASB for sediment dewatering | 5.17 |
| 7 | RI | Additional data collection | Additional core sampling | 4.10 |
| 8 | FS | Future sediment treatment | Temporary storage with future treatment | 5.18 |
| 9 | FS | Future sediment treatment | Temporary storage with future treatment | 5.18 |
| 10 | EIS | Marina comments | Opposition to development of new marina | 6.8 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

**From:** Doug Karlberg [mailto:douglaskarlberg@yahoo.com]
**Sent:** Monday, December 18, 2006 12:31 PM
**To:** McInerney, Lucy (ECY)
**Cc:** Murphy Evans
**Subject:** Whatcom waterway cleanup comments

Thank you for the opportunity to comment.

The public is offered the opportunity to comment on a variety of clean up proposals. Each proposal includes estimated cost of clean up. The premise of the opportunity to comment is that the the DOE and related parties have placed before the public adequate information on the project for the public to make informed comments.

Unfortunately the waterway project has not had a comprehensive sampling and analysis program and the data placed before the public comment period ends. The sampling that has been accomplished is of such a scant nature that both the cost estimates for clean up and the corresponding balancing information of "what the pollutants are, where are they, and in what concentrations", are simply not sufficiently known at this time of public comment. This is a fatal flaw in the decision process. 39

Asking for public comments without providing adequate information to reasonably form a conclusion is not "substantive due process", which is a guaranteed right of all citizens by the US Constitution and other major laws.

The basis analysis of this waterway cleanup decision is a balance of what the cleanup options cost versus the risks of leaving the some or all of the pollutants in place. This analysis depends on single document. This document is a survey of what pollutants are there, where they are, what are they and associated risks of each individual pollutant, and finally, in what concentrations . From this document a person could reasonably estimate the clean up costs of varying levels of cleanup.

A comprehensive analysis(or survey) with several hundred core sample may actually save money on the clean up if there are only pockets of concentrated pollutants. This survey is going to have to be done eventually as any contractor on any cleanup proposal and monitoring scheme is highly dependent on this baseline data. Why wait and accomplish this baseline data later when it is so critical to the decision process? .2-L

Further DOE cannot divorce itself from the context of this issue. The Port of Bellingham failed to adequately inform the public that they made an agreement secretly with Georgia Pacific. A reasonable person could be suspicious of this agreement for two reasons.

One: any agreement between the polluter and the developer as to what cleanup approach to utilize may be an attempt to cover up more pollution than has been disclosed. This is especially true when the preferred method of cleanup between the Port (developer) and Georgia Pacific (polluter) is to literally cover up the pollution. Only a blind person would not be able to identify substantial monetary consequences (a motivation) from this decision.

Two; Large powerful public agencies which take on developments and then privately cut deals with polluters can seriously corrupt the public review processes with DOE. The Port is no longer a party whose only interest is the public interest.

If the Port had cut this deal with Georgi-Pacific for a contractually determined preferred clean up had taken place publicly, and before the decision to purchase this property, this would have been an honest decision. Unfortunately this is not the case. In fact the Port indicated that they would be a better party than Georgia-Pacific to clean up this site.

The Port then quietly entered into an agreement whereby Georgia-Pacific decided the Port's preferred method of cleanup. Various clean up plans were being discussed and the Port's behavior at the very least undermines the public's confidence. this behavior is important and should be detailed in your recommendations.

I would hate to find out later that there was much more pollution in the waterway than had been divulged and/or discovered by a comprehensive core sampling project.

There is another logical question that has to be asked; Why does Georgia-Pacific care what clean up plan is implemented if they are selling the property to the Port? What are they hiding? Logic tells us that Georgia-Pacific has sold the property and divorced themselves form this pollution liability. This undisclosed agreement cast doubt on Georgia-Pacific's motives.

The Port has plans to move Huxley College campus to the waterfront. Huxley is an environmental sciences college. How ironic if the pollutants in the waterway were larger than expected and not cleaned up.

DOE has responsibility for the safety of the public at large. The Port is now by any reasonable definition acting as a developer of these properties. The Port intends to dramatically increase the availability of this waterway to the general public. DOE has a responsibility to take into consideration the increased in public access and the level of pollutants, and provide a plan that adequately protects the public. The Port should be boldly recognized as the developer of this property and as such the Ports' economic interests may interfere with the public safety issues. This conflict of interest should be recognized clearly upfront in any decision or recommendation. Only the DOE does not have an economic interest which would cloud their judgment in adequately protecting the public.

The economics of dredging require that the current pollution control ponds must be 40
utilized during any dredging to control the dredge spoils from re-polluting the waterway.
Maybe only temporarily, awaiting final disposal. To not utilize the current pollution
control ponds is sheer folly, economically and environmentally. 42

Simply palcing any dredge spoils into the existing GP pollution control ponds for a year 43 and letting the material fully dewater wills shave millions form this project. With a project of this size there is plenty that can be accomplished in this year. Fully dewatering the the dredge spoils may actaully pay for development costs. 44

The decision as to whether the pollution control ponds are filled in for eventual land use or shipped off to somebody else's backyard for disposal is simply not a decision that needs to be decided at this time. It is more prudent to see what is in this material and and what the volume and costs for shipping turn out to be. The dredge material must be de-watered in any proposal, so why not say so. Nobody can possibly suggest that we pay to send water to Eastern Washington! 45
Make the decision to use the ponds one way or the other, now!

Frankly the technology for cleaning up polluted material is still evolving and it may make the most sense to dredge the waterway completely into the settling ponds and thoroughly de-water the material. At this point we will know exactly what the material consists of. At this point the pollution is in storage designed specifically to contain pollution. 46

The longer into the future that we try to project costs, the more inaccurate. This whole process should be broken into stages. At each stage we will have considerable date that is now firm and not wild guess's. Where does it say that we have to make all the decisions right this very minute. This is a multi-year project, break this project into logical chunks. Parts of this project remind me of deciding what your child is going to be , before they are borne.

In conclusion, here are my simple recommendations. Recognize that without a comprehensive core sampling survey of the Whatcom Waterway, any decison may be seriously flawed. Tell the Port that any plan going forward will likely need to utilize the current pollution settling ponds. Delay the final decision to empty the ponds or turn the ponds into land use to later date. 47

Place the comprehensive core sampling survey before the public and then ask them for their decision. DOE will get a better a decision form the public with this process, building trust in DOE.

I would hate to think of the damage that would happen to the DOE's credibility if private individuals were to take core samples form the Whatcom Waterway and which showed considerably more pollution that what DOE now indicates. How much poison is there, and how toxic is the poison? These are the two most important questions that must be answered, prior to a decision. Without this information adequately estimated, DOE's decision may be fatally flawed.

Thank you,

Doug Karlberg

48

**From:** Doug Karlberg [mailto:douglaskarlberg@yahoo.com]
**Sent:** Monday, December 18, 2006 4:09 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway Cleanup

One last parting comment. After reading the comments of others on this DOE action, I have found there are some comments which indicated that a marina is some sort of fisheries habitat enhancement.

Marina are filled with boats which certainly do not have fisheries habitat enhancement characteristics. All marinas have boats which pump oily bilge water into a basically enclosed lagoon. Porta-patties are another concern, Finally most of the boats in a marina have bottom paint which is designed to kill any marine organism which comes into contact with. Most boat owners typically haul their boats once a year to "freshen up" their bottom paints' killing power.

Marinas are not enhanced fisheries habitat. The only thing that would be worse fisheries habitat... would be well ...a pulp mill.

To read a letter from a professor at Huxley College, an environmental sciences college, is
almost laughable. ( 27 Nov 06 letter from Mr. Bert Webber). This is not science, this is
politics and only goes to show to what extreme lengths the Port of Bellingham will go to 49
in snowballing folks into believing in the value of a marina. The Port will fight any
proposal which does not include their beloved marina.

DOE's obligation is to the health and safety of current and future generations. Ingore the Marina, and focus on our health. Our health is more important than a marina.

If a marina is enhanced fisheries habitat, then I want to argue about the meaning of the word "is". Please stick to good science.

Doug Karlberg

Commenter No. Name / Organization
79 Kehoe, Bob

Commenter Submittals:
A E-mail dated Nov. 21, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Recontamination & water quality | Concerns about "stirring up" contamination | 5.16 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

**From:** bob kehoe [bobkehoe@comcast.net] 50
**Sent:** Tuesday, November 21, 2006 8:49 PM
**To:** McInerney, Lucy (ECY)
**Cc:** bay foundation
**Subject:** bay 51
Leave the mercury where it is, stirring it up will be more harmful.
52

| Commenter No. | Name / Organization |
|---|---|
| 80 | Kemplin, Keith |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 17, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | EIS | Marina comments | Opposes marina | 6.8 |
| 3 | EIS | Alternative ASB uses | Favors ASB removal & habitat development | 6.9 |
| 4 | FS | Additional habitat | Favors ASB removal & habitat development | 5.22 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

52

-----Original Message-----
From: keith kemplin [mailto:keith_kemplin1@hotmail.com]
Sent: Sunday, December 17, 2006 10:48 AM
To: McInerney, Lucy (ECY)
Cc: editor@whatcomindy.com
Subject: Whatcom Waterway Site Bellingham RI/FS

Whatcom Waterway Site Bellingham RI/FS

Preferred alternative 6 assumes it is adequate to cap the mercury in
the

waterway and I believe that is not true- human disturbance, erosion and
storms could all expose the material. All the mercury in the waterway 53
and the ASB should be removed and taken to an approved toxic disposal
dump offsite.

The Port of Bellingham proposes converting the ASB to a "clean ocean 54
marina". Marinas are anything but clean and it is inappropriate for the
Department of Ecology to support such an un-ecological idea. The ASB
should be returned to it's pre-1980's natural habitat - not the Port's 55
"planned

aquatic reuse". 56

Keith Kemplin
123 Viewcrest Road
Bellingham, WA 98229

| Commenter No. | Name / Organization |
|---|---|
| 81 | Kilanowski, Elizabeth |

Commenter Submittals:

| | |
|---|---|
| A | Written comments dated Dec 11, 2006 |
| B | Written comments dated Dec 12, 2006 |
| C | Public hearing transcript excerpt |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Seismic stability | Cap stability during earthquakes | 5.7 |
| 2 | FS | Wind & wave erosion | Storm surge | 5.5 |
| 3 | FS | Wind & wave erosion | Storm surge | 5.5 |
| 4 | FS | Seismic stability | Cap stability during earthquakes | 5.7 |
| 5 | FS | Seismic stability | Cap stability during earthquakes | 5.7 |
| 6 | FS | Seismic stability | Cap stability during earthquakes | 5.7 |
| 7 | FS | Wind & wave erosion | Storm surge | 5.5 |
| 8 | FS | Wind & wave erosion | Storm surge | 5.5 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

55

Comments for the DOE Public Hearing
December 11, 2006
Elizabeth Kilanowski
PO Box 2206
Bellingham, WA 98227
kilaruba@copper.net

In my opinion, seismic events, liquefaction, and storm surge have not been adequately addressed in the RI/FS.

When an earthquake wave passes through the type of sediments in the Whatcom Waterway, those sediments can lose their cohesion and begin to liquefy causing resuspension of contaminants and woody debris. Liquefaction may be accompanied by sand volcanoes, which eject material to the surface and can breach sediment caps.

Seismic events, which can lead to liquefaction and sand volcanoes are best addressed before an alternative is chosen. The alternative selected for the Waterway (capping or dredging) could be changed by information obtained from a comprehensive seismic study. 56

The question of liquefaction should also be addressed early on in documents associated with the Chlor-alkali upland site. While much progress has been made in the past 10 years on identifying sites susceptible to liquefaction and on engineering solutions for structures constructed on those sites, much is still unknown. Citizens should be made aware of the high costs associated with building in seismically sensitive areas.

In Section 3.2 of the EIS, the statement that "no major fault lines exist in the study area" is misleading in that little work has been done in the past to identify area faults. At this time the Seismic Hazard Investigation of Puget Sound (SHIPS) project is in the process of mapping faults in Northern Puget Sound and the Georgia Basin. This study is being conducted by the USGS and organizations in Canada and has been ongoing since 1998. Several documents are available about the study.

I AM MAKING MORE EXTENSIVE WRITTEN COMMENTS ON THE LACK OF SEISMIC INFORMATION IN RI/FS.

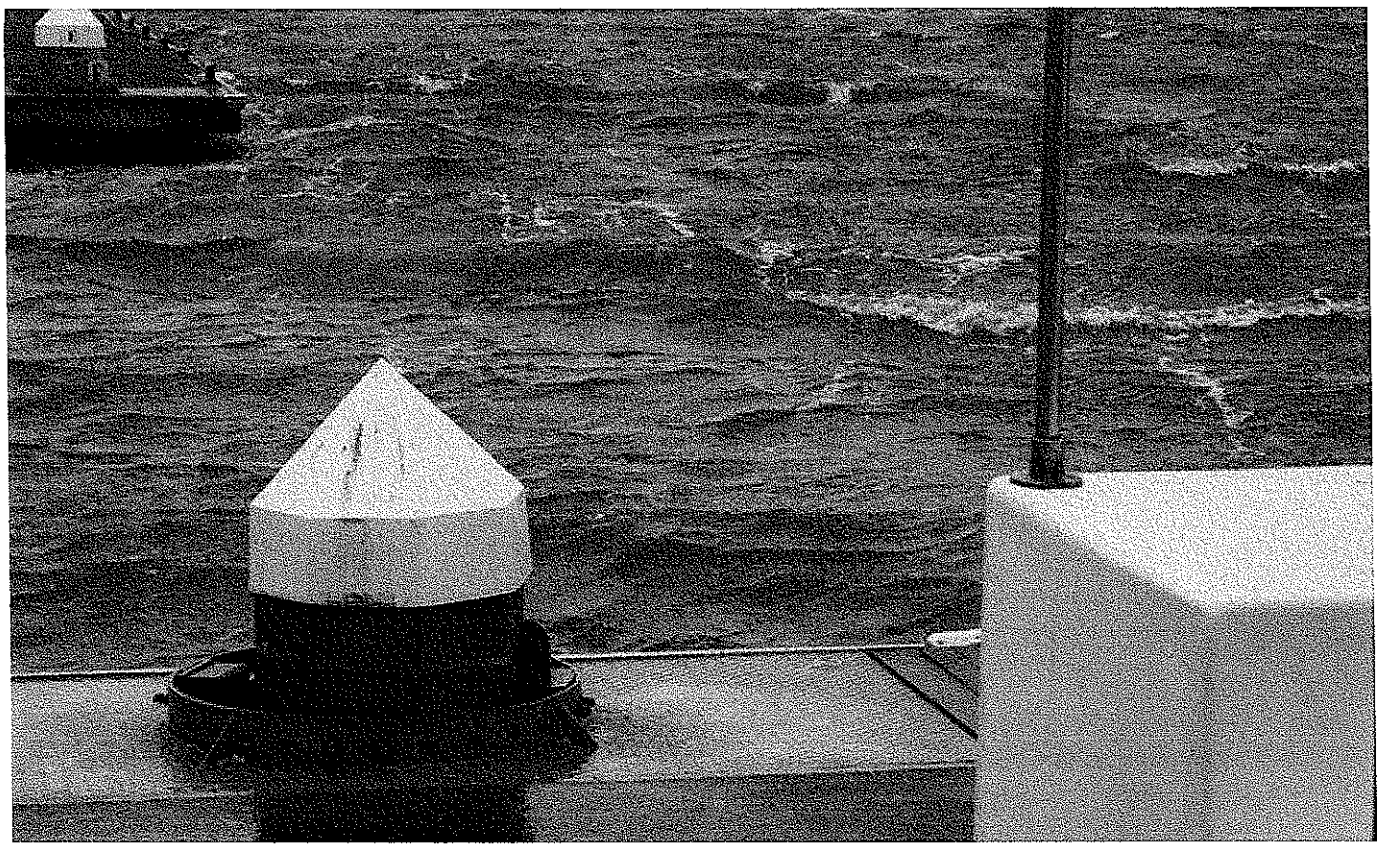
In Section 3.2 of the EIS storm surge is called "rare". What is rare: one storm a year, a decade, or every 50 years? Anecdotal evidence indicates one or two 57 serious storms in this area each year, for example the February 4, 2006 storm and the November 15, 2006 storm, both of which had significant storm surge associated with them. This is a picture I took of the Blaine Harbor docks on February 4, 2006. The pilings are very near to being topped. This is a new part of the Blaine Marina, recently dredged, with new pilings added. A higher tide or a seismic event coupled with a storm surge like this could have set the docks floating free. On November 15 of this year, a line of eel grass, 10 feet or so inland from the edge of the beach, marked the high water mark in Boulevard Park.

Storm surge is not just about water levels rising, however. There is nothing in this report about currents associated with storm events that can cause cap and bottom erosion.

Every year unexpected storm surge in our area seems to be showing us inadequacies in our previous waterfront engineering

Lastly, I wish to thank the Dept. of Ecology for hosting this public hearing at the request of local citizens. This is an important process; it gives citizens a chance to comment and to hear the comments of others.

BLAINE HARBOR
FEBRUARY 5 2005



**To:** Department of Ecology

**From:** Elizabeth Kilanowski
PO Box 2206
Bellingham, WA 98227
kilaruba@copper.net

**RE:** Comments on RI/FS and EIS for the Bellingham Bay Whatcom Waterway Site.
**Date:** December 12, 2006

A. In Volume I of the RI/FS, RETEC has copied and pasted paragraphs from the Anchor Engineering Design Report - Log Pond Cleanup/Habitat Restoration document dated 7/31/2000. It appears that these same copied and pasted paragraphs are from the Technical Memorandum by Steven L. Kramer, Ph.D.G-P Log Pond Seismic Study Whatcom Waterway Site Bellingham, Washington May 29, 2000. 59

Under Earthquake Ground Motions, copied into section 6.3.4, Seismic Influences on Sediment Stability Vol.1 RI are the following paragraphs. Only a few words have been changed, i.e. *Log Pond* has been replaced with *Whatcom Waterway* and, *is commonly*, is changed to, *can be observed*. There are more plagiarized paragraphs than the ones quoted below.

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"The (*Log Pond*) Whatcom Waterway site is located within the Puget Sound Basin, an area of active seismicity. The Site could be affected by earthquakes from three primary sources: shallow crustal faults, deep intraslab earthquakes, and interpolate (subduction) earthquakes. The contribution of each of these sources to ground shaking hazards has been evaluated by the U.S. Geological Survey (USGS; http://geohazards.cr.usgs.gov).

USGS disaggregation analyses indicate that the hazard in Bellingham is controlled predominantly by shallow crustal earthquakes at distances of less than 25 kM at a return period of 2,475 years. The relative contribution of crustal sources is expected to be even larger at the 475 year return period level.

Liquefaction (*is commonly*) can be observed in loose, saturated, cohesionless soils subjected to strong earthquake shaking. Cohesive soils, such as plastic silts and clays, are not susceptible to liquefaction, though sensitive clays may exhibit similar behavior. The potential for liquefaction to occur therefore varies from location to location with area lithology, and can affect certain site sediments, and upland soils adjacent to certain site sediment areas. The primary effects of liquefaction are flow sliding or lateral spreading. Flow sliding occurs when the residual shear strength of a liquefied soil is lower than the shear stresses required to maintain static equilibrium. While it occurs relatively rarely, flow sliding can lead to large lateral soil movements, either during or following earthquake shaking. Lateral spreading can also produce horizontal soil movements during strong ground motion. The displacements produced by lateral spreading typically develop during earthquake shaking and are complete by the time earthquake shaking has ended."

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Reprinted below are definitions of the term plagiarism.

*Plagiarize* - The American Heritage Dictionary of the English Language 1978.
"To steal and use (the ideas or writings of another) as one's own. To appropriate passages or ideas from

(another) and use them as one's own."

*Plagiarism* - http://depts.washington.edu/grading/issue1/honesty.htm#plagiarism
"One of the most common forms of cheating is plagiarism, using another's words or ideas without proper citation. When students plagiarize, they usually do so in one of the following six ways:

1. Using another writer's words without proper citation. If you use another writer's words, you must place quotation marks around the quoted material and include a footnote or other indication of the source of the quotation.
2. Using another writer's ideas without proper citation. When you use another author's ideas, you must indicate with footnotes or other means where this information can be found. Your instructors want to know which ideas and judgments are yours and which you arrived at by consulting other sources. Even if you arrived at the same judgment on your own, you need to acknowledge that the writer you consulted also came up with the idea.
3. Citing your source but reproducing the exact words of a printed source without quotation marks. This makes it appear that you have paraphrased rather than borrowed the author's exact words.
4. Borrowing the structure of another author's phrases or sentences without crediting the author from whom it came. This kind of plagiarism usually occurs out of laziness: it is easier to replicate another writer's style than to think about what you have read and then put it in your own words. The following example is from A Writer's Reference by Diana Hacker (New York, 1989, p. 171).
   * Original: If the existence of a signing ape was unsettling for linguists, it was also startling news for animal behaviorists.
   * Unacceptable borrowing of words: An ape who knew sign language unsettled linguists and startled animal behaviorists.
   * Unacceptable borrowing of sentence structure: If the presence of a sign-language-using chimp was disturbing for scientists studying language, it was also surprising to scientists studying animal behavior.
   * Acceptable paraphrase: When they learned of an ape's ability to use sign language, both linguists and animal behaviorists were taken by surprise.
5. Borrowing all or part of another ..................."

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RETEC's work violates numbers, 1 through 4 of the above criteria. It is unacceptable and unprofessional that a consulting firm that employs college graduates who have, in all likelihood, been schooled about plagiarism in their academic work to submit this report to the public. Phrases, sentences, and paragraphs that have been written by others must be identified with quotes; this makes it clear that RETEC employees were not the authors of the text.

**B**. Section:6.3.4 of Volume One cannot be verified. I went to the USGS website: geohazards,cr.usgs.gov, followed the instructions for obtaining spectral accelerations that are listed in the 2000 RI/FS and the Technical Memorandum from Dr. Steven Kramer, but omitted in the 2006 RI/FS. I was unable to replicate the statement that does appear in the 2006 document, that "the hazard in Bellingham is controlled predominantly by shallow crustal earthquakes at distances of less than 25 kM at a return period of 2,475 years." I contacted Dr. Kramer and he indicated that the number, 2,475, may have come from Anchor, who may have been given that number, "as a standard hazard level for their evaluation" and "corresponds to 2% probability of exceedance in a 50-yr period" (Dr. Kramer, personal communication). I have attempted to contact Anchor Engineering about the statement quoted above and have had no response. The statements in this section that have been copied and pasted into the document should be verified and referenced.

It should also be noted that the USGS earthquake prediction model returns a result for the Bellingham area based on faults located in Southern Puget Sound. The site is more appropriate for the Seattle area than the Northern Puget Sound area. In addition this disclaimer is on the website: the model is "not necessarily the best model for such determinations. However, it is the model that is used for many seismic-hazard assessments and it can be used as a benchmark for comparisons with *other* more sophisticated earthquake-generation models." 60

**C**. In Section 3.2 of the EIS, the statement that "no major fault lines exist in the study area" is misleading in that little work has been done to identify area faults. What should be said is, "no major faults have been mapped in the study area" or "faults assume to exist in the area but have not been mapped". The Seismic Hazard Investigation of Puget Sound (SHIPS) project is in the process of mapping faults in Northern Puget Sound and the Georgia Basin. See, U.S. Department of the Interior, USGS, Open-File Report 03-160 Wide-Angle Seismic Recordings from the 2002 Georgia Basin Geohazards Initiative Northwestern Washington and British Columbia, 2003.

**D**. Liquefaction has not been adequately addressed in the RI/FS. Sections of the Whatcom Waterway have wood waste at depth, which, in the event of an earthquake, could be resuspended by sand volcanoes, which are associated with liquefaction. Sand volcanoes are also capable of resuspending contaminants into the Waterway and of breaching a sediment cap.

In the first public meeting on October 26, Mark Larsen from RETEC, in response to a question from the audience about seismic concerns, indicated that after an alternative for the Waterway was chosen, the seismic questions would be addressed in more detail. In my opinion, seismic events, which can lead to liquefaction and sand volcanoes must be addressed before an alternative is chosen. The alternative selected for the Waterway (capping or dredging) would be affected by the outcome of a comprehensive seismic study.

**E.** Many of the documents (for example, Appendix E) have been scanned instead of prepared as regular PDF files. This has made searching them very difficult. For example, it should not be necessary for someone who wishes to verify data to type numbers into a spreadsheet in order to replicate a graph when a properly prepared document would allow for copy and paste procedures. Some of the scanned documents (Appendix A - Vol. 1) are barely readable.

References:

a. http://www.ce.washington.edu/~liquefaction/html/main.html

b. Sand Boil Mechanisms and Effects on Liquefaction-Induced Ground Deformations, (2001), Z. Yang and A. Elgamal, 15th Intl. Conference on Soil Mechanics and Geotechnical Engineering, Istanbul, Turkey, August. A.M. Ansal (Ed.), 345-350.

c. Crider, J. G.,Schermer, E. R., and Haugerud, R. A., 2001,Liquefaction of the Issaquah Creek delta during the Nisqually earthquake: Seismological Research Letters, v. 72, p. 394.

d. Galli, P., New Empirical Relationships between Magnitude and Distance for Liquefaction, Tectonophysics 324 (2000) 169-187.

e. http://geohazards.cr.usgs.gov

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Elizabeth Kilanowski**
I'm Elizabeth Kilanowski. I'm a geologist. In my opinion seismic events, liquefaction and storm surge haven't been adequately addressed in the RIFS. When an earth quake wave passes through 61
the type of sediments in the Whatcom Waterway those sediments can lose their cohesion and begin to liquefy causing resuspension of contaminants and woody debris. Liquefaction may be accompanied by sand volcano's which eject materials to the surface and can reach sediment caps.

Seismic events which can lead to liquefaction and sand volcanoes are best addressed before an alternative is chosen. The alternative selected for the waterway, either capping or dredging, could be changed by information obtained from a comprehensive seismic study. The question of liquefaction should also be addressed early on in documents associated with the Chlor-alkali upland site.

While much progress has been made in the past 10 years identifying sites susceptible to liquefaction and on engineering solutions for structures constructed on those sites. Much is still unknown. Citizens should be made aware of the high cost associated with building in seismically sensitive areas.

In section 3.2 of the EIS, the statement that quote "no major fault lines exist in the study area" quote is misleading in that little work has been done in the past to identify this area's faults. At this time the Seismic Hazard Investigation of Puget Sound, called SHIPS as an acronym, project is in the process of mapping faults in the Northern Puget Sound and the Georgia Basin. This study is being conducted by the U.S.G.S an organization from Canada and has been ongoing since 1998. Several documents are available about the studies.

I'm making more expansive written comments on the lack of seismic information in the RIFS and I'll be passing those along.

In section 3.2 of the EIS, storm surge is called rare. What is rare? One storm a year, a decade, or every 50 years? Anecdotal evidence indicates one or two serious storms in this area each year. For example the February 4, 2006 storm and the November 15, 2006 storm both of which had significant storm surge associated with them. This is a picture right here that I took in the Blaine Harbor docks of the Blaine Harbor Docks, on February 4, 2006. The pilings are very nearly topped. They have less than a foot to go. We had a high tide and a storm. There was a significant storm surge.

This is part of the Blaine Marina that was recently dredged and the new pilings are added there. These are brand new pilings. A higher tide or a seismic event coupled with a storm surge like
this could have set the docks floating free. If you could imagine what a bunch of docks would 62
look like with boats attached to them and floating free. It's a little bit scary.

On November 15 of this year a line of eel grass ten feet or so inland from the edge of the beach
marked the high water mark – Boulevard Park. Storm surge is not just about water levels rising, 63
however. There is nothing in this report about currents that are associated with storm events that
can cause cap and bottom erosion.

Every year unexpected storm surge in our area seems to be showing us inadequacies in our previous waterfront engineering.

Lastly I want to thank the Department of Ecology very much for hosting this public hearing at the request of local citizens. I think it's a very important process. It gives citizens a chance to comment and to hear the comments of others. So thank you.

Commenter No. | Name / Organization
82 | Kimmich, Mike

Commenter Submittals:
A Public hearing transcript excerpt

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Cap monitoring | Time-frame for monitoring | 5.10 |
| 3 | FS | Capping costs | Maintenance & contingent remedy costs | 5.12 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

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**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Mike Kimmich**

I would like to qualify this by saying my name is Mike Kimmich and I have a business that is more or less at the head of Whatcom Waterway, about a block off. It's a marine related business. So I have a very vested interest in the marina. That said, we've all agreed that mercury is forever. It doesn't go away; it sits there and insidiously waits for something to happen. It's not rocket
science to figure out that if you remove it, get it put away, get it out of the water, it's gone. 65
We've all read the articles about the salmon that we have mercury contamination in now and everything coming in the sound and pregnant women shouldn't eat it more than once a week and that type of thing.

Well this is just more of the same. I think that the way it's looking the two alternatives capping in place. Since we all agree that mercury is forever it comes down to dollars, dollars and cents. I
think the cost benefit analysis that was done should include long-term monitoring. You were 66
talking about a 500 year event horizon for tsunami's, etc. Well I feel very strongly that the monitoring should be costed out over that same period of time. Whether it's 100 years or 500 years. Either that or it should be monitored until technology allows us to remove the hazard that's in the waterway at this point in time. I think it is irresponsible not to do that.

I have a concern that nowhere have I heard any kind of a monitoring schedule and a cost. You say it's built into the costs of the, the cost benefit analysis. But I would very much like to hear an actual hard figure, the number of times, every other year for the next ten years, and then maybe every three years.

Also I haven't heard anything about a trigger and I think strongly there should be some type of a
trigger. If more than two or three tests show some type of an elevated level above our clean 67
water standards there should be some very specific remedies written into the, what's it called, the Consent Decree. So that it's not a "well let's negotiate what's going to happen." It's "if this happens then this is going to happen." You don't put together a program and then try and negotiate out later when the dollars become enormous what you're going to do. So that's I think needs to be removed and if it isn't then at the very least the public should know exactly what it is going to cost to monitor it and over what time period. Because it doesn't go away, it's there forever. You don't bury a poison and then forget about it after ten years because it hasn't come up and bit you in the butt.

So, that's it.

Commenter No. | Name / Organization
---|---
83 | Langei, Jim

Commenter Submittals:

A E-mail dated Dec 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

68

**From:** Jim Langei [mailto:jim.langei@wecu.com]
**Sent:** Thursday, December 14, 2006 3:55 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Regarding the New Whatcom Plan

Dear Ms McInerney,

I am a Bellingham Native who has been following the New Whatcom Plan. I am also a boater with a boat in the marina and have watched the changes taking place along our shoreline. After listening to various arguments and reviewing the drafts for the Whatcom Waterway Site, I am **in support of alternatives 5 and 6 as they currently stand**. 69

Thank you for your time and commitment to the future of the area.

Best Regards,

Jim Langei

Commenter No. | Name / Organization
84 | Linder, Jacob

Commenter Submittals:

A E-mail dated Dec 18, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | Preference not clear or not stated | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

-----Original Message-----
From: Jacob Linder [mailto:jacob.linder@hotmail.com]
Sent: Monday, December 18, 2006 9:00 PM
To: McInerney, Lucy (ECY)
Subject: Re: Whatcom Waterway Supplemental RI/FS

Lucille T. McInerney
Department of Ecology,
3190 160th Ave.
Bellevue, WA 98008

Good evening, thank you for taking the time to read this. I have read contradictory accounts as to when the deadline for comments considered for the proposed actions are to be welcomed relating to the bay, and I hope that this comes to you in time to be within the window of hearing.

My name is Jacob Linder and my home is in Bellingham. This is the place

where I will raise my children, and I see the bay as an often beautiful, yet sometimes frightening horizon. My studies in college have focused on the subjects of social theory, evolutionary psychology, and the future of our various systems in terms of technology - I am not an environmentalist or

ecologist - but I cannot imagine anything more important than the sanctity of the potential of the developing intellects of our children. As an informed citizen, I have learned about the persistent, accumulating toxins that sabotage the mental and physical health of every one of us. And while I also tire of the, "it's for the children" tagline we all see in political rhetoric, I feel that because Bellingham is going to be one of the faster growing cities during the next half-century of our state story, it will be a destination that the world will look for reasons to develop and invest in.
As such, we must pour every resource we are able to into the total cleanup of these toxins that were poured into the community during an era when the potential of our health and intellects was carelessly ignored and will be slowly revealed during the coming years. To not do so will not only reduce the potential of our state, but also the attractiveness of investment in 71

this growing city of real potential in terms of the state's commitment to making it a world class destination and business-base much like Seattle during the next half-century.

We know that these chemicals and metals decrease human potential in ways we can only understand in terms of this cleanup project being an investment in one of our most precious areas. To not advocate for and procure every resource possible to eliminate the toxic legacy that courses through the

bodysystem of every person in this city is to betray not just the victims of corporate industrial pollution, but also the future of our state in terms of the ever-increasing dependence we will have on the progressive evolution of our intellectual, mental adaptivity so necessary to success in the economics of the 21st century. Within one of the hometowns of our five state universities, I write this as a statement of recommendation for a long-term economic investment in a future economic hub of Washington State . I write this as a human being who is directly affected by the health of the water and air and life that surrounds me as nature incarnate. I write this as a native born in Seattle, for my homeland Washington State, and I thank you for your time.

(Even if it is too late, :) Thank you,

Jacob Linder

Bellingham, Washington

| Commenter No. | Name / Organization |
|---|---|
| 85 | Lookman, Diane |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Nov. 27, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Capping costs | Maintenance & contingent remedy costs | 5.12 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

72

From: diane lookman [dddiner@hotmail.com]
Sent: Monday, November 27, 2006 12:42 PM
To: McInerney, Lucy (ECY)
Cc: info@bbayf.org
Subject: letter to the DOE

Lucille T. McInerney, P.E. Site Manager

Washington State Department of Ecology

Northwest Regional Office

3190 160th Avenue

Bellevue, WA 98008-5452

Dear Lucille T. McInerney, P.E. Site Manager

Please clean up Bellingham Bay to the highest possible standard. This citizen and this letter support the Bellingham Bay Foundation calling for the DOE to approve a plan that prioritizes removing mercury-contaminated sediments rather than capping them in place. Like them, I think the long-term benefits of this approach far outweigh the short-term costs. 73

As for the costs, from first hand experience I know that environmental clean-up is expensive in time and money. From personal experience I shudder to think about what I am asking of you. But I do not hesitate to exercise my right to speak out as a citizen to clean up the waterway fully and comprehensively.

It is my humble opinion that solving a problem starts with identifying the problem correctly and problem solving from that point - in this case, there is mercury contamination in Bellingham Bay at the old Georgia Pacific Site. That they cannot be legally held responsible for the mess they left behind is moot at this juncture. Having reviewed the literature, I believe the wisest approach and in the end the shortest solution time is to fully remove the mercury-contaminated sediments in our waterways. In the end, I believe this may be the cheaper alternative if in hindsight we look back at a failed attempt to cap mercury-contaminated sediments in place. This is how I want my tax dollars spent. 74

Thank-you for the time it takes for you to read my letter. Good luck in your decision making.

Sincerely,

Diane Lookman
1504 Irving Way
Bellingham WA 98225

Commenter No. | Name / Organization
86 | Lowe, Robert

Commenter Submittals:

A E-mail dated Dec 18, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

#12-N

-----Original Message-----
From: Robert Lowe [mailto:b059@hotmail.com]
Sent: Monday, December 18, 2006 3:37 PM
To: McInerney, Lucy (ECY)
Subject: Bellingham Bay

Dear Dept of Ecology,

It is my estimation that the dredging of the ASB in the Bellingham Bay area to faciltate the new marina is by far the best option to consider. The good of the community ensures the proper response to take. Is this not the primary role of the Department's mission statement ? 75

The dollar amount is not the issue, heatlh is. Should we find it so easy to set limits on safety issues ?

Sincerely,

Robert K. Lowe

Commenter No. Name / Organization
87 Lummi Nation

Commenter Submittals:

| | | |
|---|---|---|
| A | E-mail dated Dec. 8, 2006 | Jeremy Freimund (Lummi Natural Resource Dept.) |
| B | Letter dated Dec. 8, 2006 | Merle Jefferson (Lummi Natural Resource Dept.) |
| C | Figure 1 (attached to Dec 8 Letter) | |
| D | Figure 2 (attached to Dec 8 Letter) | |
| E | Attachment 1 to Dec 8 Letter | |

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| 1 | EIS | ASB alternative uses | Full removal & habitat restoration in ASB | 6.9 |
| 2 | FS | Project funding | Funding for habitat reuse of ASB | 5.26 |
| 3 | EIS | Scope of EIS | Analysis of NEPA criteria | 6.1 |
| 4 | EIS | EIS baseline conditions | Evaluation against pre-1859 conditions | 6.1 |
| 5 | RI | Data QA/QC | QA/QC reporting for RI data | 4.13 |
| 6 | FS | Project funding | Clarification of project funding roles | 5.26 |
| 7 | RI | BSL basis | Tissue data regression analysis | 4.3 |
| 8 | RI | BSL basis | English sole data & regresssion analysis | 4.3 |
| 9 | RI | Seafood consumption rates | Types & quantities of seafood consumed | 4.3 |
| 10 | RI | Seafood quality | Concerns over mercury levels in salmon | 4.4 |
| 11 | FS | Navigation disturbances | Impacts of prop wash & anchor drag | 5.4 |
| 12 | FS | Wind & wave distrubance | Concerns over wind/waves, storm surge | 5.3 |
| 13 | FS | Navigation disturbances | Impacts of fishing activity on sediments | 5.4 |
| 14 | FS | Log Pond concerns | Analysis of data trends in Log Pond | 5.14 |
| 15 | RI | Site cleanup levels | Roles of SMS cleanup levels and BSL | 4.2 |
| 16 | FS | Whatcom creek effects | Potential disturbance during creek flooding | 5.5 |
| 17 | FS | Navigation disturbances | Impacts of prepellor wash | 5.4 |
| 18 | FS/EIS | Additional habitat | Full removal & habitat restoration in ASB | 5.22 & 6.9 |
| 19 | EIS | Scope of EIS | Analysis of NEPA criteria | 6.1 |
| 20 | EIS | Additional habitat | Full removal & habitat restoration in ASB | 6.9 |
| 21 | EIS | Scope of EIS | Analysis of NEPA criteria | 6.1 |
| 22 | EIS | Scope of EIS | Analysis of NEPA criteria | 6.1 |
| 23 | EIS | EIS baseline conditions | Evaluation against pre-1859 conditions | 6.1 |
| 24 | EIS | EIS baseline conditions | Evaluation against pre-1859 conditions | 6.1 |
| 25 | EIS | Specific references | Watershed text clarification | 6.13 |
| 26 | EIS | EIS baseline conditions | Evaluation against pre-1859 conditions | 6.1 |
| 27 | EIS | Specific references | ESA text clarification | 6.13 |
| 28 | EIS | Specific references | ESA text clarification | 6.13 |
| 29 | EIS | EIS baseline conditions | Evaluation against pre-1859 conditions | 6.1 |
| 30 | EIS | EIS baseline conditions | Evaluation against pre-1859 conditions | 6.1 |
| 31 | FS | Project funding | Funding for habitat reuse of ASB | 5.26 |
| 32 | EIS | Additional habitat | Full removal & habitat restoration in ASB | 5.22 & 6.9 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

**From:** Jeremy Freimund [mailto:JeremyF@lummi-nsn.gov]
**Sent:** Friday, December 08, 2006 4:47 PM
**To:** McInerney, Lucy (ECY)
**Cc:** Evelyn Jefferson; Merle Jefferson; Harlan James; Elden Hillaire; James Hillaire; Darrell Hillaire; Leroy Deardorff; Leonard Dixon; Tom Edwards; Stacy A. Fawell; Dean Martin; Alan Chapman; Candice Wilson; Curt C Wolters; Kathryn.A.Carpenter@nws02.usace.army.mil; Travis.C.Shaw@nws02.usace.army.mil; Randel.J.Perry@nws02.usace.army.mil; michelle.walker@nws02.usace.army.mil; mikes@portofbellingham.com; Mike MacKay; Gerald I. James
**Subject:** Lummi Natural Resources Department Comments on the Oct. 10, 2006 draft RI/FS and SEIS for the Bellingham Bay Cleanup

Lucy,
Merle asked me to transmit the attached comment letter from the Lummi Natural Resources Department regarding the October 10, 2006 draft RI/FS and SEIS for the Bellingham Bay Comprehensive Strategy. Please acknowledge receipt of this comment letter.
Kind Regards,
Jeremy

Jeremy R. Freimund, P.H.
Water Resources Manager
Lummi Natural Resources Department
2616 Kwina Road
Bellingham, WA 98226-9298
jeremyf@lummi-nsn.gov

(tel) 360-384-2212
(fax) 360-384-4737

#1-A

# LUMMI INDIAN BUSINESS COUNCIL

2616 KWINA ROAD · BELLINGHAM, WASHINGTON 98226 · (360)384-1489

DEPARTMENT________________________EXT.____

December 8, 2006

Ms. Lucille T. McInerney, P.E.
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue, SE
Bellevue, WA 98008-5452

**SUBJECT: Lummi Nation Comments on the October 10, 2006 Draft Remedial Investigation, Feasibility Study, and Supplemental Environmental Impact Statement: Bellingham Bay Comprehensive Strategy – Whatcom Waterway Cleanup Site**

Dear Ms. McInerney,

The purpose of this letter is to summarize overall comments by the Lummi Natural Resources Department on the subject draft documents and to transmit specific comments identified either by Lummi Natural Resources Department staff members and/or by environmental scientists with the Seattle District U.S. Army Corps of Engineers (ACOE). As you know, the ACOE scientists have provided technical support in our review of the draft Remedial Investigation/Feasibility Study (RI/FS). The Lummi Cultural Resources Department may be submitting comments on these documents under a separate cover.

Overall Comments:

1. The analyses are incomplete in that they did not evaluate implementation of an important alternative sub-area strategy identified in the 2000 Comprehensive Strategy EIS developed by the Bellingham Bay Pilot Team (Pilot Team). Habitat Action No. 13 identified by the Pilot Team is the removal of the Aerated Stabilization Basin (ASB) from the water and establishment of intertidal and shallow subtidal habitat and marine buffers and/or eelgrass. As described in Appendix A of the 2006 draft Supplemental Environmental Impact Statement (SEIS), Habitat Action No. 13 would result in the single largest habitat gain (33 acres) of all of the actions identified by the Pilot Team. This alternative aquatic land use should have been evaluated in addition to the alternative desired by the Port of Bellingham (i.e., converting the ASB to a marina). 1

   As you know, the Bellingham Bay Pilot Team included representatives from numerous federal, tribal, and state agencies (including the Department of Ecology and the Port of Bellingham) and worked for over 10 years on coordinated clean-up, source control, and habitat restoration planning in Bellingham Bay. As you note in Section 5 of the 2006 draft SEIS, the Bellingham Bay Pilot included an unprecedented level of community involvement and public outreach activities. In the alternatives analysis presented in the 2006 draft SEIS, if an alternative did not include converting the ASB to a marina, it was judged not to be consistent with current land use plans.

   In this current draft RI/FS and SEIS, implementation of Habitat Action No. 13 identified by the Pilot Team seems to have been dismissed as an alternative because no funding mechanisms have been identified to implement this type of project (see SEIS page 3-52). Just because the Port of

Bellingham chose not to identify funding mechanisms for this alternative does not mean that the funding mechanisms do not exist or that this alternative should not have been evaluated. The 2
Feasibility Study and the SEIS should be revised to incorporate an evaluation of the implementation of Habitat Action No. 13 alternative.

2. The draft SEIS should have been written in a manner to also address National Environmental Policy Act (NEPA) requirements. Writing the SEIS in a manner that addresses both State Environmental 1
Policy Act (SEPA) and NEPA requirements would ensure that the required federal permitting for the proposed clean up actions would be more stream-lined. This combined approach would better achieve Bellingham Bay Pilot Goal 6 (i.e., *Implement actions that are more expedient and more cost-effective, through approaches that achieve multiple objectives*). As written, the SEIS does not comply with NEPA because cumulative effects and environmental justice issues associated with the evaluated alternatives were not considered.

   Similar to SEPA, federal impact assessments specifically require treatment of cumulative effects during EPA and EIS procedures: "Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects, and any resulting environmental degradation, that should be the focus of cumulative impact analysis. While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all disturbances, since cumulative impacts result in the compounding of the effect of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community of that action and all other activities affecting that resource, no matter what entity (federal, non-federal or private) is taking the actions." (EPA 315-R-99).

   In addition, Executive Order 12898 of February 11, 1994 requires federal agencies to achieve environmental justice by addressing "disproportionately high and adverse human health and environmental effects on minority and low-income populations." The impacts of the project, both negative and positive, on minority and low-income populations must be analyzed. Environmental Justice issues include potential impacts on the physical and natural environment as well as social, cultural, and economic effects of the project. Based on the 2000 Census, the Lummi tribal members comprise the largest low income, minority population in the area and the physical, natural, social, cultural, and economic impacts of the proposed alternatives on the Lummi people need to be specifically addressed.

   The SEIS should be revised to comply with NEPA and specifically address both cumulative effects and environmental justice issues for each alternative.

3. The characterization of affected fish and wildlife habitat in the SEIS is based on current conditions rather than the more appropriate environmental baseline that existed along what is now the Bellingham waterfront prior to the substantial anthropogenic impacts to this environment. The 2
Lummi Nation is a fishing tribe and has used the waters and shorelines of Bellingham Bay since time immemorial. The Lummi Nation is one of the signatories to the Point Elliot Treaty of January 22, 1855 (12 Stat. 927) which was ratified by the United States Senate on March 8, 1859, Proclaimed April 11, 1859 and which reserves certain rights for the Lummi people including but not limited to "the right of taking fish at usual and accustomed grounds and stations" and "hunting and gathering roots and berries on open and unclaimed lands." The decision of *United States v. Washington* (384 F. Supp. 312, 377 [W.D. Wash. 1974], aff'd, 520 F.2d 676 [9th Cir. 1975], cert. Denied, 423 U.S. 1086

[1976]) and subsequent court orders, as upheld by the United States Supreme Court, provide rules of engagement of the Lummi Nation and other co-managers relating to natural resources management.

Prior to and following the arrival of Euro-Americans, the shorelines of Bellingham Bay were used as fishing villages and the tidelands and waters of Bellingham Bay were used to harvest fin- and shellfish for commercial, subsistence, and ceremonial purposes. Although the Lummi Nation still fishes the waters of Bellingham Bay, the resources have been degraded by human activities and shoreline development has precluded the use of traditional hunting, fishing, and gathering sites along the bay. As shown in Figure 1 and detailed in Figure 2, approximately 748 acres of the Bellingham Bay nearshore has been impacted (dredged, filled, or armored) including the Whatcom Waterway and the Aerated Stabilization Basin (ASB). In addition to these actions, which have physically precluded the exercise of tribal treaty rights in these areas, the Whatcom Waterway, the ASB, and surrounding areas are contaminated with a number of substances released from industrial waterfront activities including mercury discharges from the former Georgia Pacific chlor-alkali plant. By adopting the degraded current conditions as an environmental baseline, the environmental impacts of the proposed alternatives are lessened. Addressing cumulative effects and environmental justice issues will result in a more accurate assessment of the impacts of each alternative.

In summary, objectively addressing both cumulative effects and environmental justice issues and adding the Bellingham Pilot Team Habitat Action No. 13 as an alternative would help complete the analysis and support the selection of an appropriate preferred alternative.

In addition to these general comments, Attachment 1 to this letter identifies specific comments regarding the RI/FS and the SEIS.

Sincerely,

Merle Jefferson

Merle Jefferson, Executive Director
Lummi Natural Resources Department

cc Evelyn Jefferson, LIBC Chairwoman
Elden Hillaire, Lummi Natural Resources Commission Chairman

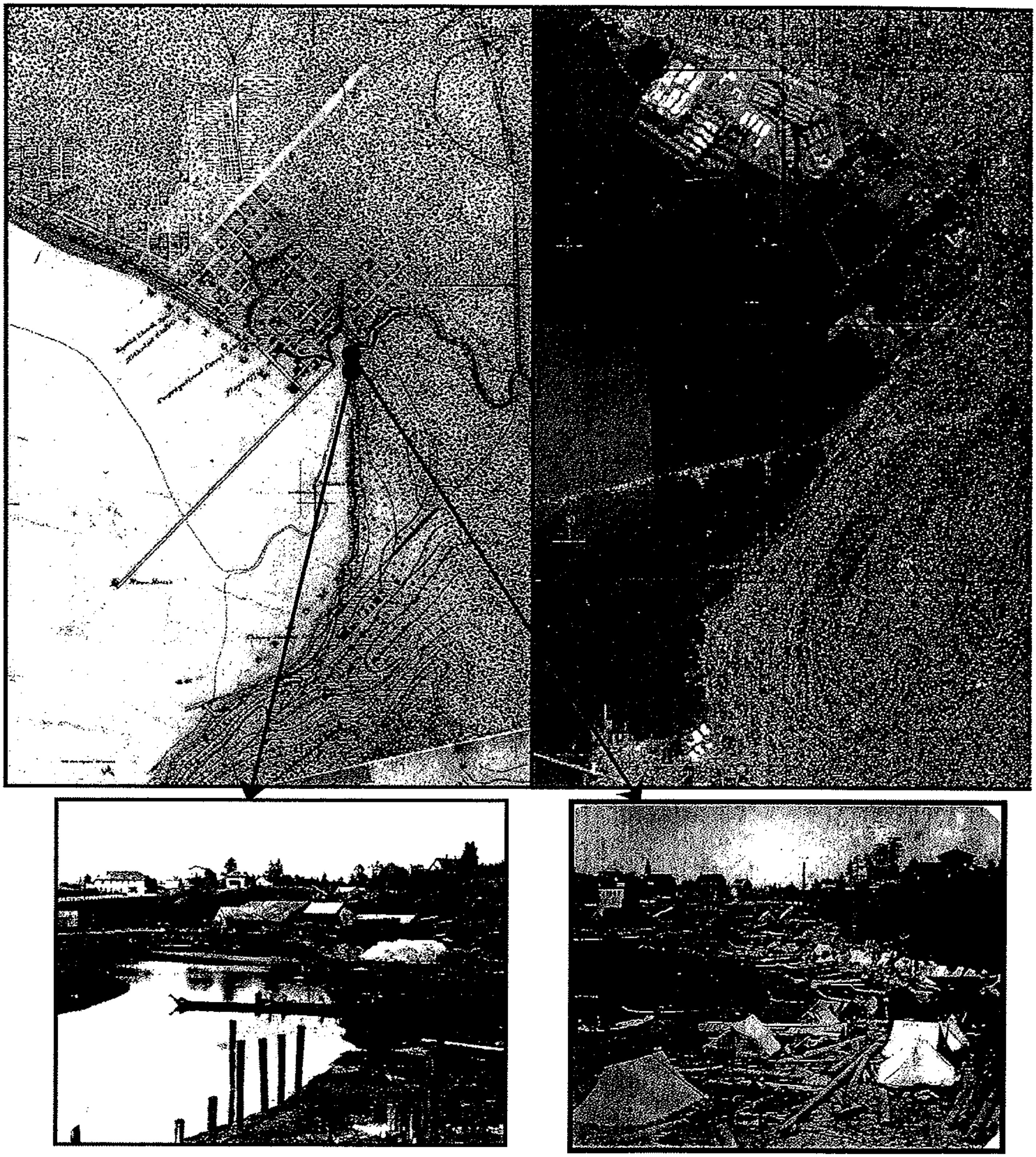

Figure 1. Bellingham Bay Nearshore Impacts

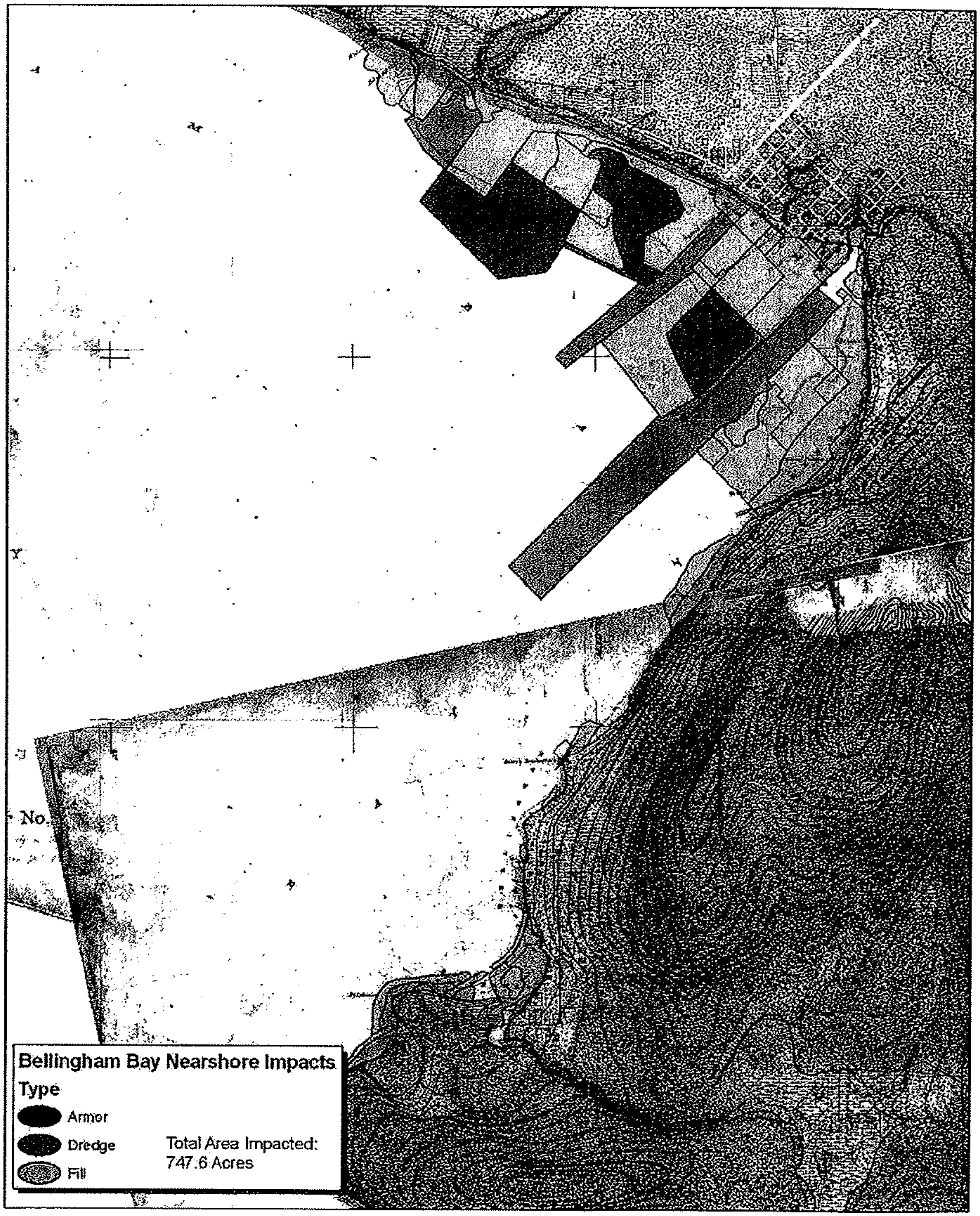


Figure 2. Bellingham Bay Nearshore Impacts

4

**Attachment 1**

**Specific Comments Submitted by the Lummi Nation Regarding the October 10, 2006 Draft Remedial Investigation (RI), Feasibility Study (FS), and Supplemental Environmental Impact Statement (SEIS): Bellingham Bay Comprehensive Strategy – Whatcom Waterway Cleanup Site**

| Document | Page/Location | Comment | |
|---|---|---|---|
| RI | General | Please include an evaluation of data quality for both analytical and bioassay results. The appendices do include some level of quality assurance reporting for the Colony Wharf and 2003 ASB sampling event. However, the newer data collected to support the Supplemental RI are not discussed or evaluated. Consider an additional appendix that summarizes or contains data assessments from the previous investigations that would help document that the data collected over the life of the project thus far are of sufficient quality for decision making. | 4 |
| RI | Page 1-1 | Please provide a description of the major stakeholders and decision makers involved in the project to clarify the role Ecology and the Port of Bellingham have in the cleanup. For example, who will be responsible and accountable for selection of the remedy, management of remedial construction, and long-term monitoring after the remedy is in place? Which organization(s) is funding the cleanup activity? | 5 |
| RI | Page 4-5 | Please clarify the regression relationship between estimated home range sediment concentrations and concentrations in tissue samples. There are several technical issues that need to be addressed either in this section or in Appendix E:<br>• It appears that the upper range of Dungeness crab data used in the regression analysis ends at 0.91 mg/kg, which is lower than the proposed BSL value. It is generally not statistically valid to extrapolate (or predict) a functional relational relationship beyond the measured range of data used in a regression (*Biostatistical Analysis*, J.H. Zar, 1984). Consequently, the statement that the Dungeness crab regression represents a conservative upper-bound estimate of mercury bioaccumulation is not technically correct.<br>• The regression of English sole had a $p$ value for the slope greater than 0.05 (Appendix E). The text should clarify that this means that the slope of the regression line for this species was not significantly different from zero, and that there is no functional relationship between sediment mercury concentrations and tissue concentrations in English sole. It is clear in Appendix E that the English sole data were not used in the calculation of the final BSL, however, this section (and Appendix E) should identify that the utility of the English sole data is limited in regards to developing the final BSL. | 6<br>#5-A |

| Document | Page/Location | Comment | |
|---|---|---|---|
| RI | Page 4-6 | The discussion of fish consumption rates should clarify which consumption rates were actually used to calculate the BSL. It is not clear that the bottomfish/shell fish consumption rate of 70 g/day was the value used to calculate the BSL and that the 173 g/day value represents total seafood consumption. This is an important point to clarify since bottomfish and shellfish represent only a fraction of the potential seafood diet of a subsistence fisher with the remainder coming from salmonid or pelagic species. If the BSL represents an estimated mercury intake to just below the reference dose, then any additional seafood consumption could push the daily total above 0.0001 mg/kg/day. Given the recent seafood advisory issued by the Washington State Department of Health for salmon species in Puget Sound, the total intake of mercury from seafood is an important issue for sensitive or subsistence fisher populations. | 3<br>4 |
| RI | Page 6-2 | Propeller wash and anchor drag are only given cursory consideration in the RI report. No specific information on potential depths of scour by propeller wash in Whatcom Waterway is presented. Wind and wave conditions have been considered in developing the remediation plan, but storm surge was not specifically incorporated. Although it is acknowledged that storm surge would be most severe under high wind and wave conditions, it still should be addressed. Please identify and discuss any other factors, such as the impact of net weight lines or crab pots from fishing activity, that might impact sediment stability if use of the site changes in the future? | 2<br>1 |
| RI | Appendix I, Table 4-2 | Mercury contamination is shown to be increasing over time for sample sites identified as SS-301, SS-40, and SS-WP-1 but an explanation for this increase is only provided for sample site SS-WP-1. Please provide an explanation as to why mercury contamination increased in the other two sample locations. | 13 |
| FS | General | Feasibility Study is not complete and should have evaluated the complete removal and restoration of the ASB site (Habitat Action No. 13 identified in the 2000 Comprehensive Strategy EIS). | 14 |
| FS | Page 3-1 | Please clarify what the specific cleanup objectives are for the Whatcom Waterway remediation. There is a discussion of the applicable SMS standards and the BSL, but it is not clear how they will be applied in the determination that the remedial action is complete. Is the intent to meet SQS or MCUL? If a sample exceeds the MCUL, but passes the bioassay, would cleanup to the BSL be initiated? Please provide a decision tree or flow chart to state the remediation goals more explicitly. | 15 |
| FS | Page 4-5 | Please evaluate the potential for discharges from Whatcom Creek to erode contaminated sediment from the tidal flats at the east end of the Inner Waterway. | 16 |
| FS | Page 4-12 | The impact of propeller wash and the type of vessels used in the area are not fully described in the discussion of the alternatives. Please more thoroughly evaluate the potential impact of propeller wash. | 17 |
| SEIS | General | The evaluation of alternatives is not complete as the remedial action of complete removal and restoration of the ASB site (Habitat Action No. 13 identified in the 2000 Comprehensive Strategy EIS) was not evaluated. | 18 |
| SEIS | General | Not complete, cumulative effects and environmental justice issues not evaluated. | 19 |

| Document | Page/Location | Comment | |
|---|---|---|---|
| SEIS | Pages 1-2 and 2-12 | The RI/FS does not provide a comprehensive evaluation of clean-up options. Should evaluate the alternative represented by Habitat Action No. 13 to make the evaluation comprehensive. | 20 |
| SEIS | Pages 1-6 and 2-13 | Should note that the federal permitting process also includes an evaluation of issues in terms of cumulative effects and environmental justice. | 21 |
| SEIS | Page 1-7 | List of primary areas of controversy and uncertainty is incomplete. Should also include:<br>• Future of the aquatic lands currently used for wastewater treatment (ASB) and associated impacts to treaty rights – conversion of the ASB to a marina as desired by the Port of Bellingham will continue to preclude tribal access to fishing grounds<br>• Cumulative effects and the appropriate environmental baseline for comparative analysis<br>• Environmental justice | 22 |
| RI, SEIS | Page 2-1 | The Site Area History section is incomplete and completely ignores the fact that the Bellingham Bay shoreline was used by Lummi tribal members for fishing village sites since time immemorial and after the arrival of euro-Americans. This section also fails to describe the habitat features of the bay (e.g., extensive eelgrass beds) and associated natural production of shellfish for ceremonial, subsistence, and commercial benefits that existed prior to the anthropogenic impacts that resulted in approximately 748 acres of the Bellingham Bay nearshore (including the Whatcom Waterway and the Aerated Stabilization Basin [ASB]) being dredged, filled, or armored (see Figure 1 and Figure 2). | 23 |
| SEIS | Page 3-5 | The section on anthropogenic shoreline modifications should be more quantitative and state that based on a comparison of the historic shoreline and current conditions (Wahl 2003), approximately 748 acres of the Bellingham Bay nearshore (including the Whatcom Waterway and the Aerated Stabilization Basin [ASB]) being dredged, filled, or armored (see Figure 1 and Figure 2). | 24 |
| SEIS | Page 3-8 | Nooksack River watershed characterization is inaccurate and incomplete. Lake Whatcom is part of the Whatcom Creek watershed, there is no discussion of 303(d) listings or of the Lower Nooksack River fecal coliform TMDL, no discussion of impacts of channelization. | 25 |
| SEIS | Pages 3-25 through 3-31 | Should be clear regarding the environmental baseline and revise text such as the following:<br>3-26: no surf smelt or sand lance spawning has been documented in inner Bellingham Bay, presumably because suitable substrates are no longer available.<br>3-27: shellfish densities are currently relatively low.<br>3-28: Because the Whatcom Waterway currently has relatively limited quantities of these habitats…<br>3-31 Whatcom Waterway currently serves more as a migration corridor between Whatcom Creek and the Whatcom Creek estuary than nursery/rearing habitat given the current lack of suitable substrate and refuge. | #7-B |
| SEIS | Page 3-30 | The Bald eagle is still protected by the federal Endangered Species Act. | 26 |

| Document | Page/Location | Comment | |
|---|---|---|---|
| SEIS | Page 3-30 | Peregrine falcons are delisted under the federal Endangered Species Act. | 27 |
| SEIS | Page 3-46 | The section on shellfish harvesting should recognize the habitat losses that have occurred due to anthropogenic impacts. Early mapping of Bellingham Bay and the presences of shell middens in the archaeological sites described on Page 3-59 suggest that historically the shellfish habitat in this section of Bellingham Bay was very good. | 28 |
| SEIS | Page 3-46 | The section on salmon fisheries should note the habitat losses that have occurred due to anthropogenic impacts. Early mapping of Bellingham Bay and the associated extensive eelgrass beds suggest that habitat for a variety of forage fish (e.g., herring, surf smelt, sand lance) existed in the action area. | 31 |
| SEIS | Page 3-52 | Habitat Action No. 13 identified in the 2000 Comprehensive Strategy EIS appears to be dismissed in this section of the SEIS by relying on the argument that no funding mechanisms have been identified to implement this action and alternative uses of the ASB have formed the basis of recent land use planning efforts. It is noted that at the time of the 2000 Comprehensive Strategy EIS development, no entity looked for these funding mechanisms because at the time the ASB was still being used for wastewater treatment. Potential funding sources for implementing this action include state and federal funding associated with the salmon recovery effort and/or the Puget Sound Partnership; the Port of Bellingham increasing moorage rates for recreational boaters; and the Port of Bellingham exercising its county-wide taxing authority. Regarding recent land use planning efforts, these efforts have been driven by what the Port of Bellingham (one member of the Bellingham Bay Pilot Team) wants to do, not what all members of the Bellingham Bay Pilot Team agreed to do. | 29 |
| SEIS | Page 3-53 | In the discussion of converting the ASB to a marina, one of the arguments provided in favor of the conversion is "net gains in both habitat and public access opportunities." The accuracy of this assessment depends on the environmental baseline used to conduct the evaluation and whether or not cumulative effects, environmental justice, and impacts to treaty rights are considered. As written, current degraded conditions are being considered the environmental baseline and cumulative effects, environmental justice, and impacts to treaty rights are <u>not</u> considered. As stated in the SEIS, if completed according to the design concept, the ASB marina would reconnect the 28-acre ASB area to Bellingham Bay and restore nearly 4,500 linear feet of salmonid migration corridor. In contrast, if Habitat Action No. 13 identified by the Bellingham Pilot Team was implemented, 33-acres of inter-tidal and shallow subtidal habitat will be restored to eelgrass beds, forage fish habitat, shellfish habitat, and nursery/rearing areas for juvenile Dungeness crab. Because of all of the dredging, filling, and armoring that has occurred, these habitat types and the resultant shellfish densities and rearing habitat for juvenile crab are currently relatively low in the action area. In addition, implementing Habitat Action No. 13 would result in public access over these aquatic lands and specifically would not preclude tribal members from harvesting fin- or shellfish over this 33-acre area. | 30 |

Commenter No. Name / Organization
88 Mackay, Michael

Commenter Submittals:

A Letter dated Dec. 18, 2006
B Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | RI | General mercury concerns | Concerns over toxic effects of mercury | 4.1 |
| 3 | FS | General capping concerns | Concerns over long-term cap effectiveness | 5.2 |
| 4 | FS | Log pond concerns | Concerns over Log Pond cap effectiveness | 5.14 |
| 5 | FS | Capping costs | Costs of long-term cap monitoring | 5.11 |
| 6 | FS | Cleanup levels | Potential future changes to cleanup levels | 5.30 |
| 7 | RI | Methylmercury | Concerns over methylmercury formation | 4.8 |
| 8 | RI | Cleanup levels | Roles of bioassay testing | 4.2 |
| 9 | RI | BSL Basis | Fish consumption rates | 4.3 |
| 10 | RI | General mercury concerns | Concerns over toxic effects of mercury | 4.1 |
| 11 | RI | BSL basis | Desire for full risk assessment | 4.3 |
| 12 | RI | General mercury concerns | Concerns over toxic effects of mercury | 4.1 |
| 13 | FS | Capping effectiveness | General concerns over cap effectiveness | 5.2 |
| 14 | RI | Additional sampling | Adequacy of existing sampling data | 4.10 |
| 15 | RI | BSL Basis | Concern over protectiveness of BSL | 4.3 |
| 16 | FS | Recontamination | Evaluation of sheet-piling during dredging | 5.16 |
| 17 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

December 18, 2006

RE: **Written Comments on the Whatcom Waterway RI/FS Documents**

Dear Ms. McInerney:

Please accept these comments on the RI/FS documents that describe alternatives for Whatcom Waterway sediment cleanup actions.

Having reviewed these documents, I am very disappointed with the overall cleanup strategy presented, as it does not adequately protect the public health or the health of the important marine resources that occupy these waters.

With no reasonable alternatives to select, I believe the best option for cleanup is an amended alternative #7. I would like to see **removal and proper land disposal of sediment exceeding the Minimum Cleanup Level (0.59ppm) for** 1
**mercury**. These areas include locations that are at a high risk for re-contamination: 1) the Inner Whatcom Waterway which is subject to river discharge, wave erosion, and prop scour and 2) the log pond where the sediment cap is already failing in several places after only a few years of service. **I would like to see capping at all other locations having mercury concentrations above the sediment quality standard of 0.41ppm.**

The higher cost for removal of highly contaminated sediments is justified because:

1. These sediments contain high levels of mercury, which is a **persistent bioaccumulative neurotoxin**. Unlike many toxins, mercury does not degrade. Mercury is rapidly concentrated in the tissues of marine animals as it moves up the food chain.
2. Mercury poisoning at levels likely to be encountered would probably result in **sub-lethal effects that are difficult to detect and difficult to trace to** 2
**the source of contamination**. In humans, the very young are most susceptible and suffer from adverse brain development resulting in decreased cognitive abilities including impaired memory, language skills, and fine motor abilities.
3. Marine organisms exposed to the toxic effects of mercury have been shown to exhibit impaired migratory and foraging behaviors. This unfortunately increases the likelihood of being preyed upon which is one aspect of bioaccumulation.
4. Long-term mercury exposure risks will remain after capping; as **not all contaminated areas can be effectively sealed by this technique.** Cap 1
deterioration in the form of erosion in shallow and exposed locations will and already has occurred. Problems with the failure of the Log Pond cap 2

have not been remedied, despite knowledge of these problems for
several years.

5. Remediation and monitoring costs over the years would soon exceed the
   additional costs incurred to remove the most contaminated sediments. 3
   Also, it is likely that sediment standards will become more protective in
   the future, requiring additional actions to bring these areas up to higher #4-B
   standards. It is cost effective to remove the highly contaminated
   sediments from the beginning.

6. We do not know the factors responsible for the conversion of mercury to
   the more toxic and biologically active form (methyl mercury). Subtle 4
   changes in the chemistry or biota of the sediments in the waterway could
   accelerate conversion to this more toxic form, increasing bioaccumulation
   effects.

Biological sediment tests are being misused to reduce the amount of area
required for cleanup and illustrate a major flaw in how sediment toxicity was 6
evaluated in the Whatcom Waterway. The biological tests were never intended
to evaluate mercury bioaccumulation risk, and so this exemption incorrectly
suggests sediments are not harmful when in fact they pose a significant
bioaccumulation risk for mercury.

Moreover, the Biological Screening Level (1.2 parts per million in sediment), the
level calculated to protect subsistence fishers, uses an unrealistic consumption 4
rate of seafood (70 grams/ day vs. 173 grams/day) and is not protective for
human health.

The most recent published crab data from 1991 and 1997 from the Whatcom Waterway show that crabs have bioaccumulated mercury and contain between 0.1 and 0.2 ppm in their tissues. At this level, subsistence fishers consuming crab as their source of seafood would eat 2 ½ – 5 times the amount of mercury considered safe by the FDA.

If you believe that mercury does not pose a human health risk to our society,
consider a recent study that found "approximately 8% of women had
concentrations higher than the US EPA's recommended reference dose (5.8
ug/L) below which exposures are considered to be without adverse effects."
(Shober et al, JAMA, April 2003) A second study estimated that between 316,588
and 637,233 children have a loss of intelligence that causes "diminished 5
economic productivity that persists over the entire lifetime of these children," and
that, "This lost productivity is the major cost of methylmercury toxicity and it
amounts to $8.7 billion annually." (Trasande et al, Env. Health Perspect., May
2005).

As you know the recently released Puget Sound Partnership Recommendations to the Governor's office included this statement for immediate action:

*"Accelerate the cleanup of in-water sites and upland sites within one-half mile of Puget Sound. The first priority for the use of Model Toxics Control Account funds should be to complete the cleanup of these sites in a* ***timely*** *and* ***protective manner."*** (emphasis added).

For the past 15 years the Department of Ecology has continued on the path of a process-oriented cleanup strategy, which is neither timely nor protective. In Whatcom Waterway, so called 'natural recovery' appears to be the Department's rationale for not expediting cleanup actions. This lack of strong leadership and political will allows toxic bioaccumulation to continue unabated which increases human health risks to our community. To continue in this way without timely and protective actions is irresponsible

I find it unconscionable that Ecology should approve this cleanup plan as written. Those representing the Port also need to consider their individual actions as they impact the health and well being of our community.

I strongly recommend that Ecology have the Port **rewrite these documents to include a more robust and protective human health risk assessment**. The rewrite needs to include an alternative that seriously evaluates the removal of the most contaminated Log Pond and upper waterway sediments using a systematic approach which **confines, de-waters and removes sediments in areas that are the most contaminated.** To do less leaves a toxic legacy for our children. #5-A

Sincerely,

Michael T. MacKay

cc: Governor Gregoire
Port of Bellingham Commissioners
Bellingham City Council

3

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Mike Mackay**
My name is Mike Mackay. I'm a fisheries biologist. I work with the Lummi Indian Nation, but I won't be speaking on their behalf tonight. I'm just going to be talking as a citizen. I live in Bellingham. I've been following this process for quite sometime actually was on the action team that Lucy is a member of and was on a meeting group that preceded that action team. So I have a background that goes back quite a ways.

So I'm going to just read off some of my written comments and if there is any time left I would just like talk a little bit about power point presentation that I hoped to give tonight. It has figures that might be interesting to some of you from a perspective that we're not used to hearing about in these documents and that's the one from the organisms that live in the Whatcom Waterway and the Log Pond – the fish, the crabs, the marine resources that we're concerned with when we're talking about mercury and bioaccumulation.

OK, so some of my comments tonight I would like to say that I have reviewed these documents and find that none of the alternatives offered provide a suitable strategy for sediment clean up which protect human health or minimizes harm to the marine environment to a significant level. I will therefore provide some comments and recommendations for your consideration and actually I'll provide written comments too for the deadline.

I believe that the overriding goal in sediment clean up must be to reduce mercury exposure to marine organisms so that we can avoid the negative consequences of bioaccumulation in populations that are most at risk. Because of the higher seafood consumption rates at risk populations include our neighbors the indigenous people and the orca whales.

Mercury poisoning is not an insignificant matter. When it occurs it affects the very young by interfering with proper development of the brain and nervous system Children who have been exposed to high levels of mercury suffer with learning disabilities and distorted vision. These problems affect them their entire life. We can only imagine what the consequences are for marine organisms but they're similar other studies have found. For example fish become disorientated and do not have the ability to migrate successfully when exposed to levels of 4
mercury.

Mercury poisoning may not be as rare as you might think. A recent medical journal, and this is the AMA – Journal of the American Medical Association, volume 289, number 13, April 2nd 03. It states that samples from 8 percent of pregnant women in their sample group, and it was several hundred samples I believe, found that the levels of mercury in these women's blood was at a level that was high enough to cause harm to their unborn fetuses.

This is a national sort of study, but it does illustrate some of the problems that are real problems that we need to – there is a reason we're trying to clean up sediment in Bellingham Bay. We just can't forget that. To accomplish a significant reduction of exposure risk to mercury would require some of the most highly contaminated sediments be physically removed from the waterway.

I can't believe over the 15 years or so that I have followed these processes with Ecology that we have not yet arrived to a place where serious consideration is being given to remove one cubic yard of sediment, contaminated sediment, out of the Whatcom Waterway or Log Pond area. I just can't believe that isn't seriously considered as an alternative.

Unfortunately these documents drafted by the Port's consultants and approved by Ecology suggest clean up measures that rely heavily on sediment capping and natural recovery. They allow contaminated sediments to pass the state's minimum clean up level using a flawed evaluation process that uses other types of biological tests which were not intended to evaluate mercury bioaccumulation risk. So it's a very major flaw in this whole design in terms of screening sediments. They use tests to eliminate further clean up using tests that don't look at the bioaccumulation risk. They're designed for other sorts of measures of toxicity.

**Moderator**
Sir you have about a minute left please.

**Mike Mackay**
OK. Capping contaminated sediments with clean material is a legitimate way to reduce exposure in areas where mercury exists in low concentrations. Capping is not appropriate where mercury levels in the sediments are high. This is because there are significant unacceptable risks that the cap will leak. Even if the cap were to initially seal the contamination ensuring 100 percent 2
effectiveness in the cap over the long term is not presently feasible. Given the expected level of monitoring suggested by these documents.

You know. If George is somewhat alarmed by the sampling grid being sparse as referred to the sampling of sediments, you ought to look at the biological data. You know there is just nothing 1
there to base some of the human health risks analyses they've created in these documents. It's all about sample size and good science and non-biased science and I just don't think we have it in 13
these documents. We ought to scrutinize the human health risk analysis much further. I have several specific comments and I'm sure others do too concerning that very important part of these documents.

We are fortunate that the configuration of the shoreline along the waterway lends itself to isolating pockets of contamination for removal. There is within the Log Pond and the upper waterway the most contaminated areas can be confined using sheet pile to dewater and remove 14
these sediments. The ASB pond could also be used for dewatering sediments prior to transport.

**Moderator**
If you could summarize please.

**Mike Mackay**
A plan that does not include the removal of the most highly contaminated sediments is not a clean up plan it's a sweep it under the rug plan and should be rejected. Thank you. 15

| Commenter No. | Name / Organization |
|---|---|
| 89 | Maliszewski, Charles |

Commenter Submittals:

| | |
|---|---|
| A | Public hearing transcript excerpt |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | RI | Cleanup levels | Role of bioassays in site cleanup levels | 4.2 |
| 2 | RI | BSL basis | Regression analysis | 4.3 |
| 3 | RI | BSL basis | Fish consumption rates | 4.3 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Charles Maliszewski**
Hi, my name Charles Maliszewski. I live at 760 Old Samish Road. First of all I would like to congratulate you guys for sitting through an entire evening of this. It's kind of like the people at a carnival everybody is throwing water balloons at and making sure that they fall into the big tank of water.

Actually I would like to thank you for being public servants. I know it's not an easy job. I will return the discussion to the more arcane. There have been some very eloquent testimonies here and all I wanted to address was the numbers being used by the Department of Ecology as determinants of whether something is a safe mercury level.

I'll try not to talk too much about MCUL and SQS and BSL but my finishing statement will be we hope you will use the MCUL as your determinant for what is a safe level of mercury in sediment and subsurface sediment and I have two main reasons why I would argue that.

The first reason is because there are many sites in the bay that exceed MCUL and SQS. The numbers say that chemically there is too much mercury here. The bioassays don't support that. 1
The MCUL and SQS numbers are built on a circular argument about chemistry vs. biology There are so many holes in that argument. Now again I realize this is state law, it's not likely that my testimony is going to change it, but if it doesn't happen at this site, boy I sure wish would really think harder about that bioassay versus chemistry argument because as a scientist it makes no sense to me at all.

As an example because we do see a lot of sites out here that exceed the MCUL but don't pass the bioassay one objection that I do have is once that is site no longer, once that site passes a bioassay almost never has anyone gone back to those sites to retest for chemistry and biology. So what one sees as you follow the timeline from when testing began was fewer and fewer and fewer bioassays to the point it was just a handful in the last series of tests. That to me makes no sense, because you've gone from barely statistically significant to nonstatistically significant.

OK let's get away from MCUL we'll go to BSL. So BSL is the bioaccumulation screening level that's based on a comparison between the amount of mercury that is measured in organisms from the area relative to the amount of mercury that is in the sediments that are within the home range of these organisms. There was a regression analysis that was performed. Don't need to go into details on that, that will be written up, that suggests that 1.2 mg/kg is a safe level. Several problems with the regression analysis. The first problem is that when you do a regression analysis you never go beyond your data points to come up with a value and that's exactly what 2
you do. I believe the highest sediment value on the regression curve is .9 where as you come up with a 1.2 mg/kg. That's just bad math, you can't do that.

Secondly, we are assured throughout, I believe it's section 5 of the RI that conservative estimates are used throughout in determining the what is considered the safe level. Well Wendy's scientific advisory group spent a lot of time going over those numbers. We've got biologists, geologists, hydrologists, toxicologists and none of us was able to make real sense of it. In fact I have to say the latest iteration; the latest explanation in this RIFS is so cloudy that I literally stayed awake nights trying to figure out what it really meant.

OK let's get down to basics. If you really take into account subsistence level consumption of fish 1
and shellfish in this area and you plug that into the regression analysis you come up with a value that is 2.5 to 5 times lower than the BSL that is actually generated from the description in the RIFS. That's a number that is even lower than the MCUL. So a proper BSL is even less than the MCUL which requires bioassay support.

So conservatively then I would argue that you use the current MCUL as your level for determining what a safe level of mercury in sediment and subsurface sediment. Thank you.

Commenter No. | Name / Organization
---|---
90 | Malone, Tom

Commenter Submittals:

A E-mail dated Dec 18, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Tom Malone [mailto:tmalone@comcast.net]
**Sent:** Monday, December 18, 2006 7:40 AM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms McInerney

I am a Whatcom County resident and an avid boater on Bellingham Bay. I have reviewed the draft RI/FS and EIS documents for the Whatcom Waterway Site. I am in support of the preferred alternatives 5 and 6 as they are currently documented. Thank you for your time and commitment to the future of the area. 1

Regards,

Tom Malone
Bellingham, WA 98225
360-393-0714

Commenter No. | Name / Organization
--- | ---
91 | Mansker, Anna

Commenter Submittals:

A E-mail dated Dec 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: anna mansker [mailto:thelasmom@hotmail.com]
Sent: Thursday, December 14, 2006 10:31 AM
To: McInerney, Lucy (ECY)
Subject: bham bay cleanup

Dear Ms. McInerney

I wish to add my thoughts to the consideration of the options to the cleaning of the mercury in Bellingham Bay. I feel that in order to avoid the unknown future expense both financially, environmentally, and to people's health, the best option is a complete cleanup and removal of the mercury at this time. 1

Thank you for your thoughtful consideration of this matter.

Sincerely,

Anna Mansker

Commenter No. 92 — Name / Organization: McAuley, Michael

Commenter Submittals:

A E-mail dated Dec. 18, 2006

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Michael McAuley [mailto:mmcgolly@yahoo.com]
Sent: Monday, December 18, 2006 12:22 PM
To: McInerney, Lucy (ECY)
Subject: Whatcom Waterway Cleanup

Ms. McInerney,

Having lived within blocks of the Whatcom Waterway for eight years now, as well as being a Board Member of the adjacent Lettered Streets Neighborhood Association, I have come to understand the high value of our waterfront both culturally and monetarily.

In our neighborhood meetings over the past year we have discussed the clean-up repeatedly and worry about certain effects of the clean-up and eventual redevelopment on our neighborhood.

Time and again the consensus we hear is that "we" should clean up the waterfront to the greatest extent possible. But it should also be sensible and cost effective.

Of the options outlined recently, one has not been considered: dredge the waterway only to depth required to remove the mercury laden sediments and clean the uplands to the greatest extent of technological possibility. Dredging to a full 30 foot depth of the old channel is not necessary if there is no mercury there. 2

Thank you for your time and consideration,

Michael McAuley
PO Box 2807
Bellingham, WA 98227

360-201-7199

Commenter No. 93

Name / Organization: McCune, Mike

Commenter Submittals:

A	E-mail dated Dec 13, 2006

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 3 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| | | | | |

**Notes:**

EIS	Supplemental Environmental Impact Statement
FS	Feasibility Study (Volume 2 of Supplemental RI/FS)
RI	Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS	Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: michael mccune [mailto:satyamjm@yahoo.com]
Sent: Wednesday, December 13, 2006 10:07 PM
To: McInerney, Lucy (ECY)
Subject: cleanup, not cover up

Dear Friend,
I was unable to let my voice be heard at the Monday night event and so
I resort to the second best option of emailing you directly. As a
citizen of Bellingham, a teacher of children in the community, i must
say that I believe that the cover up of the mercury is in NO WAY
acceptable to me. The future generations of this city deserve better. 1
Mercury is forever and when the Port bought the G-P Site they should
have had the foresight to realize that the people of Bellingham will
not stand for any half-hearted measure that leaves the cost of clean-up
on future generations.
The current capping plans do not take into account the real costs that 2
capping entails, long term monitoring being just one example.
Know that as a voting member of this community, as a concerned citizen
of this world, i believe that capping only creates costs and problems 1
for future generation. Clean-up is our responsibility.

Thanks For Your Time,
Mike McCune

Commenter No. Name / Organization
94 McDiarmid, M

Commenter Submittals:
A E-mail dated Dec 17, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Capping effectiveness | Concerns over long-term effectiveness | 5.2 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Henry and Mickey [mailto:rojoyeti@sysmatrix.net]
**Sent:** Sunday, December 17, 2006 12:35 AM
**To:** McInerney, Lucy (ECY)
**Subject:** clean up

Lucille T. McInerney, P.E., Site Manager
Department of Ecology, Northwest Regional Office
3190 160th Avenue
Bellevue, WA 98008-5452

December 18, 2006

Dear Ms. McInerney:

My vote is for a full clean up. I do not believe capping is a solution to the long term situation for the health of the bay, aquatic life and the community at large.

I understand the reason that dredging will not be used is because it is more expensive and there is risk that it may recontaminate sediment on a short-term basis. I would like Ecology to evaluate the options to dredge the sediment in the Waterway, log pond, and lagoon and to contain it using state-of-the-art technology. I know that this will be more costly than the current alternative that was chosen by Ecology, but I believe it is a smarter choice over the long run. 1

In addition, Ecology should redo it's analysis so it reflects that dredging is more protective than capping over the decades. 2

Thank you,

M Mc Diarmid

507 E. Illinois St.

Bellingham WA 98225

Commenter No. | Name / Organization
95 | McGowan, Kirk

Commenter Submittals:

A E-mail dated Dec 15, 2006

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Kirk Mcgowan [mailto:kirk.mcgowan@oracle.com]
Sent: Friday, December 15, 2006 10:34 AM
To: McInerney, Lucy (ECY)
Subject: Whatcom Waterway RI/FS/EIS Public Input

Dear Ms McInerney,
I am a Whatcom County resident that frequents Bellingham Bay. I have reviewed the draft RI/FS and EIS documents for the Whatcom Waterway Site. I am in support of the preferred alternatives 5 and 6 as they are currently documented. Thank you for your time and commitment to the future of the area. 1
Regards,
Kirk McGowan

Commenter No. | Name / Organization
---|---
96 | McKee, Phyllis

Commenter Submittals:

A    E-mail dated Dec 8, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS    Supplemental Environmental Impact Statement
FS    Feasibility Study (Volume 2 of Supplemental RI/FS)
RI    Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS    Responsiveness Summary (Narrative)

#1-A

**From:** Jonasson@aol.com [mailto:Jonasson@aol.com]
**Sent:** Friday, December 08, 2006 9:17 AM
**To:** lydiab@portofbellingham.com
**Cc:** McInerney, Lucy (ECY)
**Subject:** Remedial Investigation Feasibility Study

*Lydia Bennett, CCIM, CPM*
*Director of Real Estate*
*Port of Bellingham*
*1801 Roeder Avenue*
*Bellingham, WA 98227-1677*
*360-676-2500 ph / 360-671-6411 fax*
*lydiab@portofbellingham.com*

Regarding: Remedial Investigation Feasibility Study

Dear Lydia,

Thank you for meeting with us the other day regarding parking.

As to the subject of any clean-up pf contaminated waterways near the GP plant in Bellingham I would like to see a practical and pragmatic approach to the matter. Of the options shown, I would favor # 6 as it includes manageable clean-up and then containment. 1

Should you need anything further from me, please let me know.

Regards,

Phyllis McKee

827 Blueberry Lane # 202

Bellingham, Washington

360-676-5278

| Commenter No. | Name / Organization |
|---|---|
| 97 | Meyer, Jeanette |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec 17, 2006 |
| B | Public hearing transcript excerpt |

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

**From:** Jenny & Floyd [mailto:jenny.floyd@danjoranch.com]
**Sent:** Sunday, December 17, 2006 10:35 PM
**To:** McInerney, Lucy (ECY)
**Subject:** bellingham waterfront clean-up

Bellingham has been my home for almost 80 years now and I remember the awful choking air of downtown back as far as my school days, from the pulp mill I was told. My wish is to have ALL of the toxins removed. It bothers me to put it in somebody else's back yard. If they can contain it securely in that distant place far from our waterway & soil perhaps a way will be found in the future to separate the different contaminants from harmless residue. Money and inconvenience, a lovely park and marina, the wishes of investers and planners with grand ideas should not take precedence over cleaning it up FIRST. We would not invite folks to a nice dinner without seeing the floor, chairs, tableware, etc. are really clean. How could we enjoy the grand plan you have for that area knowing under our feet & nearby lies the refuse material that could make people sick? We've just had some bad storms, and future storms, earthquakes, eruptions could burst the bubble. We wouldn,t have the stuff in our homes, or yards, or neighborhoods, so why in our city?The dollars should go for the cleanup first; then you may start building for a great waterfront. Thank you for your work on this. 1

Ph: 319-8987 Jeanette (Jenny) Douglas Meyer, 3028
Cottonwwod Ave, Bellingham, WA 98225

2

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Jenny Meyer**
I want to agree with everybody that spoke tonight. Jenny Meyer and I'm from the Birchwood district. I lived here most of my life. I remember going downtown when we had to take a handkerchief and hold it over our nose because what we called the pulp mill had this stuff in the air. And we were down Cornwall and Holly Street. It went all over the place and we couldn't breathe so we would get on the bus and go home. That's not great. They should have done something then. But I haven't heard anything about how you're disposing of all this junk. You're going to go dig a hole in somebody else's mountain and put it down there for them to take care of? And we're going to pay for that also?

Why don't we just build or get some great big heavy tanks that are secure and put all that
garbage in there until in the future somebody smart, like these people, will know how to separate 1
this stuff and get rid of it safely. That's all.

Commenter No. | Name / Organization
---|---
98 | Milstead, James

Commenter Submittals:

A    Ecology Transcription of Dec 18, 2006 Verbal Comment

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Seismic concerns | Sediment stability during earthquake | 5.7 |
| 3 | RI | General mercury concerns | Concerns over toxicity of mercury | 4.1 |
| 4 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| | | | | |

**Notes:**

EIS    Supplemental Environmental Impact Statement
FS    Feasibility Study (Volume 2 of Supplemental RI/FS)
RI    Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS    Responsiveness Summary (Narrative)

The following verbal comment was received by Ecology on December 18, 2006:

James Milstead
1469 Oriental Avenue
Bellingham, WA 98226-5033

I am absolutely opposed to capping the mercury contaminated area. I think we need a 1
complete cleanup. It is obvious that we are in jeopardy of a substantial earthquake within 2
the next twenty years. I think it calls for responsible action on the part of the Port and I
regard this whole thing as a scam from the beginning. I think Georgia-Pacific donating
the land to Bellingham in return for Bellingham being responsible for the cleanup is 1
outrageous. In any case I am for a complete cleanup. This mercury is a toxic material.
The term mad-as-a-hatter comes from its use in the hat making industry. Anything less 2
than a complete removal is putting us all at risk.

Thank you very much.

| Commenter No. | Name / Organization |
|---|---|
| 99 | Moore and Company |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Nov. 21, 2006 | Steve Moore (Broker) |

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Land use changes | Support for waterfront land use changes | 6.6 |
| 3 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 4 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
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| RS | Responsiveness Summary (Narrative) |

#1-A

Moore and company
A COMMERCIAL REAL ESTATE GROUP

21 November 2006

Lucille T. McInerney, P.E.
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Ms. McInerney:

I would like to express my thoughts on the future clean-up of the Whatcom Waterway Site in Bellingham, Washington.

I am a Commercial Real Estate broker and have dealt with land, wetlands, and development throughout the West. I thoroughly reviewed the materials from the Department of Ecology and I am in support of Alternative #6 for cleaning the site and getting it ready for redevelopment. 1

The land which makes up the former Georgia Pacific site will provide Bellingham and Whatcom County with an opportunity to return the former industrial land to a more open and public use. The unique partnership between the Port and the City of Bellingham will allow the site to be fully redeveloped, providing housing, jobs, recreation, waterway access, and a full gamut of services to our community. 2

In cleaning the contaminants on the site, I believe that we must choose the option which provides for a nexus between public safety, redevelopment potential and cost. I believe Alternative #6 provides for this nexus by ensuring the full site can be used for redevelopment (including development of a public marina in the old GP Ponding Basin), while using approved methods to dredge, cap and provide for shoreline stabilization. 1

Alternative #6 has received a High overall MTCA ranking, meets all MTCA threshold criteria, and its restoration time frame is amongst the lowest of the eight alternatives being reviewed. Furthermore, MTCA ranks the overall benefits of Alternative #6 as High, finds the costs of the clean-up to be proportionate to the benefit, and that the alternative is permanent to the maximum extent practicable.

Many, many citizens of Bellingham and Whatcom County are excited about the potential of this important redevelopment project, and I am certainly one of them. Alternative #6 will provide our community with the best opportunity to clean this site, and return it to the use of the community. 2

**Please support Alternative #6.**

Sincerely,

Steve Moore

Steve Moore

114 W. Magnolia, 4th Floor, Bellingham, WA 98225

Commenter No. | Name / Organization
--- | ---
100 | Nagel, Toni

Commenter Submittals:

A E-mail dated Dec 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Toni Nagel [mailto:toninagel@earthlink.net]
Sent: Saturday, December 16, 2006 7:27 AM
To: McInerney, Lucy (ECY)
Subject: Whatcom Creek Waterway Mercury Cleanup

Dear Representatives of our Environment and the Department of Ecology,

I encourage you to pursue an in-depth clean up of the mercury within the Whatcom Creek waterway. The level of cleanup should not be an issue, a full clean up is the right thing to do for us and future generations of humans and wildlife to come. I support a full removal of mercury from the marine environment and disposal in an approved upland disposal site. The cost of such an endeavor should not play a role in the level of cleanup for a site contaminated with mercury. Salmon return to this creek, residents fish here and eat the salmon. Kids play in the creek at low tide. Many of us kayak in the waters of this waterway. A determination by participating property owners should not be taken into consideration as "Impracticable" options. Capping is not an option. The citizens entrust our environment to the Department of Ecology and hope that you will have the foresight to do the right thing, which seems to be a no-brainer for our future -- a full clean up of the contaminated waterway. 1

Sincerely,

Toni L. Nagel
2415 I Street
Bellingham, WA 98225

Commenter No. Name / Organization
101 Naismith, Anne

Commenter Submittals:
A Comment form dated Oct. 30, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Climate change | Impacts of sea level rise on cap stability | 5.6 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

10/30/06

# Whatcom Waterway Site

WASHINGTON STATE DEPARTMENT OF ECOLOGY

#1-A

## Comment Form

This is an invitation for comments on the draft Supplemental Remedial Investigation/Feasibility Study and draft Supplemental Environmental Impact Statement for the Whatcom Waterway site in Bellingham, Washington. If you wish to comment, please fold, affix postage, and mail this form to Ecology by December 9, 2006 (address on reverse).

*Name and address optional*

Name.... Anne Naismith

Address........

City........ Zip Code ........

E-mail Address.. sailcoast@earthlink.net

Computer projections predict a water level raise between 3 and 20 feet as a result of global warming. This depends on the severity of the land mass ice melt, but it could occur within the next 40-50 years. Does the EIS or RI/FS address this and if so, what assumptions are used. If not, why not? 1

| Commenter No. | Name / Organization |
|---|---|
| 102 | Niedermeyer, Thomas |

Commenter Submittals:

A E-mail dated Dec. 15, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

**From:** th.niedermeyer@comcast.net [mailto:th.niedermeyer@comcast.net]
**Sent:** Friday, December 15, 2006 3:41 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms. McInerney,

I live in Whatcom County and I am a boat owner. My sailboat occupies one of the 1400 slips in the Bellingham marina.

I have read the draft RI/FS and EIS documents for the Whatcom Waterway Site. You should know that, like many others, I support the preferred alternatives 5 and 6 as they are currently written. 1

Thank you for your consideration.

Sincerely,
Thomas Niedermeyer

Commenter No. | Name / Organization
---|---
103 | Northwest Marine Systems LLC

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Nov. 21, 2006 | Chris Hughes |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Land use changes | Support for land use changes | 6.6 |
| 3 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 4 | EIS | Land use changes | Support for land use changes | 6.6 |
| 5 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

# NORTHWEST MARINE SYSTEMS LLC

21 November 2006

Ms. Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452
VIA E-MAIL: lpeb461@ecy.wa.gov

Ms. McInerney:

We write regarding the clean-up strategy for the Whatcom Waterway Site in Bellingham, Washington. After carefully reviewing relevant materials, we are convinced **Alternative 6 is the preferred alternative** for site remediation, environmentally sound clean-up, and the benefit of the community as a whole. 1

The 137 acre Georgia-Pacific site, transferred to the Port of Bellingham in January 2005, offers an unparalleled opportunity to convert contaminated former industrial land into one of the West Coast's most attractive waterfronts. The positive effect on Bellingham's waterfront and downtown core is difficult to overstate. Alternative 6 will allow full site utilization – providing housing, jobs, recreation, and waterway access in appropriate locations consistent with community-oriented redevelopment. 2

Here in Bellingham, we have the advantage of extremely competent leadership at both the Port of Bellingham and the City of Bellingham, leadership uniquely committed to a coherent long-range, community-based vision for Bellingham's waterfront. <u>With that in mind, we join the Port of Bellingham and the City of Bellingham in recommending Alternative 6 as the preferred site clean-up alternative</u>.

In assessing the risk of projects undertaken by the federal government, the U.S. Army Corps of Engineers uses a three-part test, known as "The Three E's" of project due diligence: (1) engineering justification; (2) economic viability; and (3) environmental acceptability. Each factor is equally important and must be carefully balanced with each other.

Given the federal government's inevitable participation in funding and permitting, it is conceptually useful to consider the Whatcom Waterway Site clean-up from their perspective. Of the proposed alternatives, it is obvious that Alternative 6 will best address and balance environmental and public safety considerations with redevelopment potential and cost. Alternative #6 does this by ensuring the full site can be used for redevelopment (including development of a public marina in the Aeration Stabilization Basin), while using approved methods to dredge, cap and provide for shoreline stabilization. 1

Alternative 6 also rates best applying MTCA standards, receiving a High overall MTCA ranking, meeting all MTCA threshold criteria, with restoration time frame the lowest of all eight alternatives under consideration. Overall MTCA benefits are rated as High, with Alternative 6 providing the best cost to benefit ratio. Also of importance to DOE's MTCA analysis, Alternative 6 is permanent to the maximum extent practicable.

As a Canadian citizen born and raised in Vancouver B.C., I had the opportunity to witness Vancouver's dramatic rebirth – occasioned in large measure by that city's commitment to waterfront redevelopment. Today, Vancouver – and the False Creek / Granville Island area in particular – is an internationally-known destination, and the hub of a vibrant urban community.

A great deal of Vancouver's success can be directly attributed to decisive leadership, which allowed Vancouver to maintain positive forward momentum in waterfront redevelopment plans despite the complexity and scope of the task at hand.

Decisive leadership is even more important in Bellingham's case, because time is of the essence. As anyone familiar with growth patterns in the Puget Sound basin can attest, Bellingham and Whatcom County face tremendous growth pressure. Every day, sprawl drains capital, political will, and vitality away from waterfront and downtown redevelopment. Accordingly, delay in waterfront clean-up will promote sprawl, traffic, and infrastructure problems in one of the Northwest's last remaining gems, Whatcom County.

On the other hand, a decisive plan for waterfront clean-up will unarguably spark tremendous
investment in Bellingham's urban core. Therefore, moving forward without delay will not only 2
serve the interests of the Bellingham community, but will help implement the policies of the
Growth Management Act on a region-wide basis – a mission with which the Department of
Ecology is statutorily charged. While diligent and thorough clean-up analysis is paramount, we
also hope you will continue to proceed decisively.

We strongly recommend adoption of Alternative 6 as the preferred site clean-up alternative. We
thank you for the opportunity to comment, and request that you make this letter part of the 3
official record of this matter.

Very Truly Yours,

Mr. Chris Hughes

Bcc: Jim Darling, POB Executive Director
Tim Stewart, COB Planning Director

Commenter No. | Name / Organization
---|---
104 | Olsen, Thomas

Commenter Submittals:

A	Letter dated Oct 27, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 3 | RI | Cleanup levels | Toxicity thresholds & cleanup levels | 4.2 |
| 4 | FS | Project permitting | Desire to move forward with project | 5.27 |
| | | | | |

**Notes:**

EIS	Supplemental Environmental Impact Statement
FS	Feasibility Study (Volume 2 of Supplemental RI/FS)
RI	Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS	Responsiveness Summary (Narrative)

#1-A

2024 Falcon Court
Bellingham, WA 98229
October 27, 2006

Ms. Lucille T McInerney
Washington Dept. of Ecology
3190 160th Ave SE
Bellevue, WA 98008

**Re: Written record submission for Bellingham "G-P" cleanup project file**

I attended your informational meeting at the Bellingham Cruise Terminal on October 26, 2006, and I thank you for organizing a lucid and informative session. As is so often the case with public meetings conducted by government entities, a disproportionate turnout of critics and opponents seemed to be in attendance last evening

These critics seem to espouse a let-the-perfect-be-the-enemy-of-the-possible philosophy. If so, I don't share it. You explained that pragmatic reasoning – based on empirical testing, experience with other similar projects, anticipated land uses, and other relevant factors – led to prioritization of Options 5 & 6. That thinking seems sound to me. 1

Some other Options, if I understand them correctly, would fill the ASB with toxic sediment dredged from the adjacent waterways. If only "zero" mercury will satisfy the purist critics, then how can a toxic landfill in the middle of the waterfront be acceptable? In other words, the idealist's arguments seem internally contradictory and inconsistent. 2

I'm under the impression that mercury compounds are present, in very low concentrations, in the surrounding environment beyond the G-P study area, so I conclude that a theoretical "zero" mercury level is unattainable outside a laboratory.

I thought that an implicit assumption in critic's questions yesterday was the perennial argument over safety thresholds for toxins, radiation, etc. To express it in analytical terms, is the line from the (0,0) origin on a dose-response graph to the lowest measurable toxicity a stair step or a ramp? After a working career in the pharma industry I'm not a newcomer to toxicity testing, and I don't believe the balance of scientific evidence supports the "no-safe-threshold" advocates. Based on the accumulating evidence I've seen, healthy flora and fauna have some degree of toxin/radiation "damage repair" capability (but obviously only up to limits). In my view, existing environmental exposure regulations are clearly not premised on no-safe-threshold reasoning. 1

In sum, prioritizing G-P Options 5&6 seems correct and appropriate. I hope the multi-step remediation planning process can move ahead as expeditiously as possible and that the actual cleanup work can get under way sooner rather than later. 2

Sincerely,

Thomas F. Olsen

Thomas F. Olsen

Commenter No.   Name / Organization
105   Parker, Stan

Commenter Submittals:
A   Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Cleanup levels | Potential future changes to cleanup levels | 5.30 |
| 2 | FS | Capping effectiveness | General concerns over capping effectiveness | 5.2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Stan Parker**
Stan Parker, Columbia Neighborhood. Right now the Bay's got a lot of mercury in it. That mercury is there on your watch, you guys permitted it and the main reason for that is 40 years ago, the environmental laws were very lax. 50 to 60 years ago they didn't exist. We don't know what those laws will be like 50 to 60 years from now. There's a good chance they will be a lot more stringent and thresholds will be a lot tighter.

If you do cap it and your cap is successful by today's standards and you monitor it and you go out 50 years from now and take a core sample and monitor it and it meets the standards you're saying now but it doesn't meet the new standards we have 50 years from now, now you're in a dilemma. I mean you have a good opportunity right now because the whole GP site is barren and you can clean it up and you can dredge. If the City gets its way and the whole area is covered with 20 story high rises, it's going to be very difficult to go back 50 years from now and clean it up to a higher standard. 1

This is a great opportunity to do a good job and I think capping is the wrong way to go just because you don't know what is going to be here 20, 50 100 years from now. You've done some capping in Puget Sound and it works you have a good track record, but your track record is 20 or 30 years. You don't have a track record of 200 to 300 years for capping and the mercury is going to be there forever and we just don't know. What you know is it might last for 20 years, you don't know if it going to last for 200 and the only thing to do is get rid of as much as you can. 2

Commenter No. Name / Organization
106 Paskus, Matt

Commenter Submittals:
A Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Project funding | Concerns about project impacts on taxes | 5.26 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Matt Paskus**
Hi, Matt Paskus, county resident. I just want to make sure all the parties involved make sure it's done right. As the Department of Ecology stated 50 percent of coverage. What that alternative, the final alternative we just want to make sure its not based off the number of slips and let's see and the cost because basically the cost is going to dictate how many slips are going to be purchased by or designed by the Port and I just want the reassurances from all these agencies that we are not held responsible as tax payers. As the Port mentioned this will be coming from grants and those grants are not assumed are coming from some kind of export fees or import fees I'm not an expert on it. The other side of it is it won't come from property taxes now we know the 1
Port does accept property tax income but again they're assuring us that none of this is going to come from any of that income and that's it, thanks guys.

Commenter No. | Name / Organization
--- | ---
107 | Paxton, Tim

Commenter Submittals:

A E-mail dated Dec 7, 2006
B E-mail dated Dec 8, 2006
C Attachment (Laucks data report) to Dec 8 E-mail

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | RI | Radioactive materials | Concerns over Cornwall Landfill data | 4.16 |
| 2 | RI | Radioactive materials | Concerns over Cs-137 data | 4.16 |
| 3 | RI | Other contaminants | Concerns over fluoride data for GP outfall | 4.17 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Tim Paxton [mailto:tim_paxton@yahoo.com]
Sent: Thursday, December 07, 2006 12:53 AM
To: McInerney, Lucy (ECY)
Cc: editor@whatcomwatch.org; editor@whatcomindy.com; editor@cascadiaweekly.com; info@bbayf.org; Waters@re-sources.org; robynd@re-sources.org; tip@skookum.us
Subject: Comments and request for additional documents for Bellingham Bay Clean Up

lpeb461@ecy.wa.gov

Lucy McInerney
Washington Dept of Ecology

Dear Ms. Lucy McInerney:

Please submit this letter for the public hearing record of Whatcom Waterway Site-Bellingham Environmental Cleanup. The attached list of requested reports and documents for inclusion was from a 2004 letter written by a now absent Bellingham citizen researcher on GP and Bay Pollution reports.

For the record please include :

1. Whatcom County Health department reports on hazardous waste found on Cornwall Beach in 1992. In
1992 March/April there was apparently "hazardous waste" found on the beach near Georgia Pacific. The report is at the Whatcom County Health dept. (and also at Dept Of Ecology ) The photos shows that Health Department employee Regina DelaHunt apparently did the inspection herself. There is medical tubing and reddish goo. It is apparently Baxter or 3M separation tubing from the 1980's. The beach was used a municipal landfill from 1955-1962 Please include this report in the Environmental Clean up documents for public review.

A report on the possible radioactive contamination of the beach was apparently performed by consultants (Analytical Resources for the Port of Bellingham. 1
Please submit for the public hearing record of Whatcom Waterway Site-Bellingham Environmental Cleanup the attached 1996 document from Analytical Resources, Incorporated apparently showing evidence of the radioactive substances Tritium and Cesium 137 in the Cornwall Landfill. Mr. Ryan Ferris included a copy of this report in a letter to Dept of Ecology.

There were follow up articles in March 1993 in the Bellingham Herald. In the article apparently Ms.
DelaHunt states" that electricity was to be run through the glass to clean up the site". There are pictures of her at the site these are the first official conductivity studies. There is documentation by her and Dr. Frank James- but she took over the assessment. Dave Bader was also aware of problems. You will find this data under Cornwall, it is also tucked away in Preston, Gates and Ellis files at Local Health Department. (Bellingham Herald Newspaper articles

are available on microfilm at the Bellingham library). Some of this might be Re-filed under Douglas Management- originally it was under Cornwall Landfills.

The tubing is not medical waste from 1950s or 1960's as reported. The radioactivity is not medical waste.
Tritium is apparently a defense industry waste.
Cesium is not medical waste. GP was apparently allowed to have cesium on site- but there are NO records. ( At DOE or DOH that track amounts).

2. Please also include the 1992/1993 GP Negotiation files- at City of Bellingham, local Health Department, and local DOE office. ( Doug MacKay of Port of Bellingham, John Anderson from GP, and Mr. Bader attended) Reportedly, This investigation led to further bay studies and was the beginning of the Bellingham Bay Studies.

This was actually the beginning of the Bay studies.
Some of the above is also to be at local DOE office as well. At Whatcom Health Department. you will find copies in the Preston, Gates & Ellis files. In these files you will also find samplings taken at site that show high heavy metals- iron, copper, and also CYANIDE . (10ppm- well above federal standards).

3. Anecdotally there was are report that GP and/or the Port put in a new lead wall and put truckloads of gravel and lead at the beach at the end of Cornwall Avenue. Photos of the wall and its construction are to be found at Dept of Ecology and Whatcom County Health Department.

The lead wall and gravel would alter conductivity and radioactive readings. Readings were also different at high and low tides...esp. in the summer the readings were higher. Whatcom County also purchased Geiger counters at the same time. (2000/2001)

We would also like to request that Department of Ecology include the following :
A. All (Dept of Ecology and Whatcom County Health Department ) Cornwall Beach reports B. Conductivity and Radiological studies:** Robert Guenther / Manchester labs**.
C. 1992-1998. Hart Crowser Reports, Anchor Reports, Purnell and BEK reports on Bay.
D. All GeoEngineering Reports of 1990's thru 2000.
E. Records of GP's Cesium handling permit from Dept of Ecology or EPA

Cesium was found on some of these reports ( Anchor) .
DOH and DOE were asked about cesium. Apparently the public was told that GP is allowed to have cesium on site. That of course does not explain WHY cesium is found on Bay reports 2

4. Please have Department of Ecology include ALL Boulevard Park studies and reports.

5. Please include the The USGS samplings and study of

2002- initial results released Fall 2003- publicly the results were not released of the Bay but review the whole report conductivity and radiological studies were done, of Bay and Whatcom County- it was a huge study- Get the real study - You can find these results in at USGS in Washington DC. Please contact Washington DC USGS offices. Reportedly Cesium was checked for in the County in vast number of locations.

These reports also reportedly have geiger data on it, cesium readings, as well as lead, gravel and metals.
Also showed contamination from mercury and methylmercury.

6 Please include all EPA Region 10 RCRA (Resource Conservation and Recovery Act) reports- there were up to 22 sites with in mile of Cornwall beach - EPA.

7. Please also include the EBANCO tank reports on Bay - Located at DOE in Olympia, Washington.

8. In Fall 2002/August EEN, a local environmental group, was requested by EPA Region 10 to write a MultiMedia Investigation Request . In that request EEN did request to the County Council and County that this site (Cornwall Beach) be evaluated and closed.
The Multi Media Investigation request also request fish be tested for cesium. Please include this Multi Media Investigation request.

9. Please also include the Encogen files- the surveying work examined 1990 included Cornwall. ( Lone Star Energy) DOE local and Olympia

10. Please include all the Purnell Engineering Reports 1992-on for the Bay- City of Bellingham.

11. Please include the BEK engineering reports on Bay- both of these involve research by local geologists.

12. Please include the Dept of Ecology Bellingham / Bremerton Storm Drain Studies- 1996-2000.( Initial ones 1992) Reportedly these showed mercury contamination in every storm drain tested in Bellingham.

13 Please include the GP On Site Inspection reports I and II 1993 and 1994. Metals analysis by James Cubbage. These files were located at the DOE office in Olympia and also in Bellingham.

14. Please include the GP/Wilder files at DOE Olympia. Mr. Tom Eaton now at EPA was the previous Hazardous Waste Director of DOE and he should know
where these files are. Please be aware some of these files esp. Some key DOE files are reportedly in now Governor Christine Gregoire's Personal Private Storage
- because she was DOE Director in 1988-1992 when Mr. Tom Eaton was Director of Hazardous Waste at DOE.

15. Please include the Lauke 1996-1998 GP Effluent reports- which shows Boron, cobalt, aluminum etc. contamination. These results are unusual ...NOT normal Pulp waste. (DOE) ( Original work Order
#95-10-401

16. Please include the 1993 Whatcom Creek Sept. "Sulfite Spill" GP A huge 2,000,000 gallon spill- there are Aerial Photos and also reports at the DOE that show the Bay glowing. ( DOE)

17. Please include the A. Cummings Bellingham Air Filter Report- at Manchester Lab- it has a CASE Number 1114-01. Results did also go to the Washington State Attorney General's office. Call Manchester Labs- ask Dickey Huntimer to send you photos of the Enlarged Magnetic charged particles.

18. Please include a search for reports in Dept of Ecology about Georgia Pacific to be found filed in the Automotive section of the Industrial Section DOE Olympia.

19. Dr. Frank James from Whatcom Health Department reportedly ordered the contaminated Cornwall Beach fenced, closed and have a guard placed on it to keep the public off. This order was ignored by Whatcom County. Please include any and all letters and memos to this effect from Whatcom County and/or Dr. Frank James' records.

20. Please include any Dept of Ecology reports of GP handling imported waste, toxic waste, pulp waste or defense industry waste from outside of Bellingham including possibly Hanford.

21. Please include articles from the Whatcom Independent relaying positive testing of Cornwall Beach for radioactive contamination. See Dec 10th, 17th issues 2004.

22. Please include any permits for handling radioactive materials issued to GP by Dept of Ecology and/or EPA.
Also include any reports on disposition of said materials by GP.

23. Please include all information on abandoned Sehome and other coal mines beneath GP site and Bellingham Bay including EPA's recent 2003 Superfund Preliminary Assessment done on Bellingham Coal mines.

Thank you for your kind cooperation in including these possibly accidentally omitted reports.

Sincerely,
Tim Paxton
Clean Water Alliance
Bellingham, WA 98225

cc:files, legal, GP

---

-----Original Message-----
From: Tim Paxton [mailto:tim@synthesiscompany.com]
Sent: Friday, December 08, 2006 11:25 AM
To: McInerney, Lucy (ECY)
Subject: GP Fluoride Levels

lpeb461@ecy.wa.gov

Lucy McInerney
Washington Dept of Ecology

Dear Ms. Lucy McInerney:

Please submit this attached file for the public hearing record of Whatcom Waterway Site- Bellingham Environmental Cleanup.
The images are in JPEG format.

Please find attached files showing testing done in 1995 by Lauck Laboratories for GP Bellingham showing what appears to be high levels of Fluoride 1.5mg/L contamination. #4-B

I believe that Dept of Ecology clean up plans should eliminate all toxic

fluoride from these waterways and sediments.

Thank you.

Tim Paxton
Clean Water Alliance

Laucks Since 1908
Testing Laboratories, Inc.
940 South Harney St. Seattle, WA 98108 (206) 767-5060 FAX (206) 767-5063
Chemistry, Microbiology and Technical Services

CLIENT: Georgia Pacific Corp.

# Certificate of Analysis

Work Order # 9[illegible]
Sample(s) Identified Above

TESTS PERFORMED AND RESULTS:

| Analyte | Units | 01 |
|---|---|---|
| Fluoride (Method 300.0) | mg/L | 1.5 |
| Iron (Method 6010) | ug/L | 880. |
| Lead (Method 6010) | ug/L | 50. U |
| Magnesium (Method 6010) | ug/L | 3500. |
| Manganese (Method 6010) | ug/L | 270. |
| Mercury (Method 7470) | ug/L | 0.2 U |
| Methylene Blue Active Subs | mg/L | 0.06 |
| Molybdenum (Method 6010) | ug/L | 10. U |
| Nickel (Method 6010) | ug/L | 20. U |
| Nitrate + Nitrite as N | mg/L | 0.42 |
| Organic Nitrogen as N | mg/L | [illegible] |
| Selenium (Method 7740) | ug/L | 5. U |
| Silver (Method 6010) | ug/L | 10. U |
| Sulfate (SO4) | mg/L | 500. |
| Sulfide | mg/L | 1. U |
| Sulfite as SO3 | mg/L | 1. U |

| Commenter No. | Name / Organization |
|---|---|
| 108 | Pemble, Constance and James |

Commenter Submittals:

| | |
|---|---|
| A | Letter dated Nov 11, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | RI | Cleanup levels | Role of MCUL and BSL in site cleanup | 4.2 |
| 3 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 4 | RI | Cleanup levels | Role of MCUL and BSL in site cleanup | 4.2 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

Ms. Lucille T. McInerney
P.E. Site Manager
Dept. of Ecology NWRO
3190 160th Ave.
Bellevue WA 98008-5452

November 11
512 Darby DR. #112
Bellingham 98226

Dear Ms. McInerney:

Our understanding is that under state law the cleanup of the
former Georgia-Pacific site on Bellingham Bay, should: be imple-
mentable, be as permanent as feasable, protect human health and
the environment over the long term, take the public's concerns into
account and to be no more costly than is needed to meet the cleanup
objectives.

In that light, we submit that the same cleanup standard should 1
be applied to all portions of the affected site. We are convinced
that to meet the standards above to the fullest extent possible,
the Maximum Cleanup Level standards should be applied to the Whatcom 2
Waterway, the ASB and the terrestrial portion of the site. This
method will be in the long term the most economical, protective and
safe way to minimize mercury accumulations of any form in the food
chain. Removal of all mercury is particularly important in areas 1
shown to be prone to erosional activity; and where biological ac-
tivity helps in formation of the most toxic form of mercury, methyl-
mercury.

If the cleanup of the G/P site is to be done, it should be done
in the most complete form technically possible. We expect that
this approach my well cost more than a less effective one. However, 2
if over the long haul use of the BSL method proves to be inaffective,
it would surely entail much greater financial and environmental costs.

We submit that the site should be cleaned NOW and COMPLETELY,
using all available techniques and land based storage sites available.

Thank you for your attention to our concerns.

Respectfully,

Constance P. Pemble

Constance P. Pemble

James A. Pemble

James. A. Pemble

| Commenter No. | Name / Organization |
|---|---|
| 109 | Pemble, Rodd |

Commenter Submittals:

| | |
|---|---|
| A | Letter dated Dec. 11, 2006 |
| B | Public hearing transcript excerpts |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Disproportionate cost analysis | Adequacy of alternatives evaluation | 5.25 |
| 3 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 4 | EIS | Habitat backfill in waterway | Addition of material after dredging for habitat | 6.10 |
| 5 | RI | BSL basis | Fish consumption rates | 4.3 |
| 6 | RI | Cleanup levels | Roles of SMS & BSL in cleanup action | 4.2 |
| 7 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 8 | FS | Institutional controls | Waterway institutional controls | 5.28 |
| 9 | FS | Log Pond Concerns | General concerns over Log Pond cap | 5.14 |
| 10 | RI | Additional data | Concerns over existing data adequacy | 4.10 |
| 11 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 12 | FS | Wind & wave erosion | Concerns over wave erosion of sediments | 5.3 |
| 13 | FS | Navigation disturbance | Concerns about vessel prop wash | 5.4 |
| 14 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 15 | RI | BSL Basis | Seafood consumption rates | 4.3 |
| 16 | RI | Cleanup levels | Roles of SMS & BSL in cleanup action | 4.2 |
| 17 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 18 | FS | Capping costs | Costs of cap repairs & contingencies | 5.12 |
| 19 | FS | Institutional controls | Transfer of cleanup information into future | 5.28 |
| 20 | FS | Log pond concerns | Concerns over Log Pond cap performance | 5.14 |
| 21 | FS | Project funding | Proposes additional taxes for cleanup | 5.26 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

Submitted 12/11/06

12/11/06

#1-A

Lucy McInerney
Project Manager
Department of Ecology

**Re: Whatcom Waterway Clean-Up**

Dear Ms. McInerney,

I am speaking tonight in opposition to the selection of preferred alternatives 5 or 6 by the Department of Ecology. I base my opposition on three arguments.

First, there is a logic problem with the approach of dredging mercury laden sediments from the aerated stabilization basin, or ASB, and a bit from the deep water shipping terminal, while capping the vast majority of mercury laden sediments in the Whatcom Waterway. 1

Mercury concentrations in the ASB will be subject to virtually no wave action while the Waterway sediments will be exposed to constant wave action. Mercury sediments in the ASB will be subject to much less scour from boat traffic than the constricted Waterway. Mercury sediments in the ASB are obviously not subject to creek flows like sediments in the creek. Mercury concentrations in the shipping terminal are much lighter than in the Inner Waterway 2

So why is it of paramount importance that we dredge such toxins from the ASB and the shipping terminal, but leave Whatcom Creek contamination in place? Because there's another agenda, that's why. The Port Commissioners held a lot of public meetings and took in many, many comments from citizens, then decided to do what it appears they planned to do all along: install a new marina in the ASB, and maintain deep water shipping. According to the Department of Ecology flyers mailed to my home, DoE must plan for local land use changes, and the Port apparently had the final say in the land uses for the ASB and Waterway. Despite Department of Ecology statements that the Port must do what DoE tells them to do, it appears that political decisions made months or years ago by our Port Commissioners now drive citizens' clean-up choices.

Where are Alternatives 9 & 10, removing all contaminated sediments above state clean-up levels in the ASB and Whatcom Waterway, then restoring Waterway habitat, and 1
either building a marina or adding more habitat in the ASB? Who decided that if you dredge the entire Waterway of mercury, you must go back to using the creek for industrial purposes? I imagine alternatives 9 & 10, though they may in fact be MORE 2
cost effective, did not fit with the Port's dreams and thus were dismissed out of hand. It seems there are inconvenient truths everywhere one goes these days

My second objection to all the alternatives is a baseline assumption about how much fish the average person eats and how action threshholds are determined. Mercury 3 bioaccumulates from sediment up the food chain If you say the average fish eating person eats less than 5 ounces of fish per day, as the Department of Ecology did, then you end up justifying more mercury remaining in the food chain without clean-up. However, if you say the average person eats maybe 10-12 ounces of fish per day, you must strive to remove more of the mercury before people and other animals ingest it I grill wild caught fish frequently, and my family of four easily eats a whole 3 pound salmon in one meal, much less one day. Raise the daily fish assumption to reflect the real world, and let the chips fall where they may

Along the same lines, I was dismayed to see bioassays supplanting direct human health risk assessment, again, with the effect that mercury concentrations more than DOUBLE the state clean-up standard will be allowed to remain in our Waterway. This administrative sleight of hand ought to make Department of Ecology scientists hopping mad. What is the state clean-up action level for, if Department staff can overrule its implementation arbitrarily? #4-B

My third objection to alternatives 5 & 6 rests on a more difficult question. How much will it cost to monitor and repair the proposed capping, who pays for that, and how can we ensure the caps and monitoring in perpetuity? 4

A Department of Ecology sediment scientist said during a recent public meeting in Bellingham that $250,000 a year might easily be in the ballpark of monitoring costs for the capping proposed – add $250,000 per year to cover likely repairs to the caps, and in just 50 years we'll have spent $25 million MORE dollars and we'll still have major mercury contamination in Whatcom Waterway. In 100 years we'll have spent $50 million and the waterway will still be polluted In 500 years, our community will have spent $250 million dollars and the waterway will STILL be polluted with mercury.

$25 million dollars, coincidentally, is roughly the amount taxpayers would have to pay beyond clean-ups funds provided by the state and other grants, to completely clean up the **entire** Whatcom Waterway and the ASB **NOW**.

On a related, but critically unique note, no one has yet described the organization who will be responsible for carrying knowledge of the mercury forward indefinitely into the future, to prevent future generations from accidentally releasing hazardous mercury once again into the bay. We have trouble preserving societal information and standards for one hundred years – how will we possibly manage it for one thousand, or ten thousand? Who volunteers for the mercury priesthood? And who will pay their wages? 4

Do we think because we will be dead and gone, we should not worry about it? Nevermind that the log pond cap is <u>already</u> failing at certain points after just <u>five</u> years – a pox on us if we blithely assume the future will take care of itself, for we have buried almost the equivalent of spent nuclear fuel at our own front door, in an environment that changes constantly and is subject to mass disruption. Not only do alternatives 5 & 6 assume an infant technology, capping, will last forever, but they have no guidance on 5 how we are to remain on guard and careful for as long as humans and animals live upon this shore.

As a taxpayer, husband, father, businessman, and boater, I think common sense says clean up all the poison **now** as best we can, instead of relying on a technical fix and paying forever for monitoring and repair. If the doctor had the opportunity to remove all the cancer from your child or your spouse, would you choose to leave half of it and have them endure years of chemo, because radical surgery might cost twice as much? A truly clean waterway and ASB is the best gift, the only <u>responsible gift</u> this community can give to future generations - our children's and their children's. Seventy times seven generations.

Or we can take the cheaper way out, and saddle our descendants with an eternity of vigilance and expense for a problem we caused, but could not bring ourselves to clean up. What a sad commentary that would be on the generation of Washington leaders and citizens who cry "We must hold students accountable."

Twenty-five years from now, as we watch otters play along the banks of Whatcom Waterway some summer evening, I want to be able to look my daughters in the eye and say, "I did my part." Tax me my share of the extra money and for once let's get it right.

Sincerely,

Rodd Pemble

Rodd Pemble
2915 Cedarwood
Bellingham, WA 98225

6

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Rodd Pemble**
I have a terminal affliction with doing math problems in my head so I couldn't resist when I heard a 100 foot diameter earlier for the sample radius or one sample serves a circle 100 feet in diameter. Well it was 100 to 500 I believe. So I'm going to give them the benefit of the doubt and let's say it only represents 100, much more dense than if it were 500. #5-A

That's the equivalent, 25 samples, of talking to 3 people in Whatcom County each year for the last ten years and deciding based on those 25 or 30 conversations what the people in Whatcom County are like. So think about that. That's how much we know about the sediment in the Waterway.

I'm speaking tonight in opposition to the selection of preferred alternatives 5 or 6 by the Department of Ecology. I base my opposition on 3 arguments. 3

First there is a logic problem. With the approach of dredging mercury-laden sediments from the aerated stabilization basin or the ASB and a bit from the deep water shipping terminal while capping the vast majority of mercury-laden sediments in the Whatcom Waterway. Mercury concentrations in the ASB will be subject to virtually no wave action while the waterway sediments will be exposed to constant wave action. #7-B 4

Mercury sediments in the ASB will be subject to much less scour from boat traffic then the constricted waterway. Mercury sediments in the ASB are obviously not subject to creek flows like sediments in the creek as our last speaker pointed out.

Mercury concentrations in the shipping terminal are much lighter than in the inner waterway. So why is it of paramount importance that we dredge such toxins from the ASB and the shipping terminal, but leave Whatcom Creek contamination in place? Because there is another agenda, that's why.

The Port commissioners held a lot of public meetings and took in many, many comments from citizens and then decided to do what it appears they planned to do all along. Install a new a marina in the ASB and maintain deep water shipping. According to the Department of Ecology flyers mailed to my home DOE must plan for local land use changes and the Port apparently had the final say in the land uses for the ASB and the waterway. Despite Department of Ecology statements that the Port must do what DOE tells them to do it appears that political decisions made months or years ago by our Port commissioners now drive citizen's cleanup choices.

Where are alternatives 9 and 10, removing all contaminated sediments above state cleanup levels then restoring waterway habitat and either build a marina or adding more habitat in the ASB? Who decided if you dredge the entire waterway of mercury, you must go back to using the creek for industrial purposes? I imagine alternatives 9 and 10, though they may in fact be more cost 2 effective, did not fit with the Port's dreams and thus were dismissed out of hand. It seems there are inconvenient truths everywhere one goes these days.

My second objection to all the alternatives is the baseline assumption about how much fish the average person eats and how action thresholds are therefore determined. Mercury bioaccumulates from sediment up the food chain but if you say the average fish eating person eats less than 5 oz of fish day as the Department of Ecology did, then you end up justifying more 1
mercury remaining in the food chain without cleanup.

But what if you say the average fish eating person eats maybe 10 or 12 ounces of fish a day. You must strive to remove more of the mercury before people and animals ingest it. I grill wild caught fish frequently and my family of four easily eats a 3 lb salmon in one meal, much less one day. Raise the daily fish assumption to reflect the real world and let the chips fall where they may.

Along the same lines I was dismayed to see bioassays supplanting direct human health risk assessment. Again with the effect that mercury concentrations more than double the state cleanup standard will be allowed to remain in the waterway. This administrative sleight of hand ought to 13
make Department of Ecology scientists, like this gentleman who is sitting in front of us and who was at the meeting at the courthouse the other night. I would think it ought to make you hopping mad.

What's the state cleanup action level for if department staff can over rule its implementation arbitrarily?

My third objection to alternatives 5 and 6 rests on a more difficult question. How much will it cost to monitor and repair the proposed capping? Who pays for that? And how can we ensure the 14
caps and monitoring in perpetuity?

Department of Ecology sediment scientists said during a recent public meeting in Bellingham that a quarter million dollars a year might easily might be in the ballpark of monitoring costs for the capping proposed. Let's add another $250,000 a year to cover likely repairs to the caps and in 15
just 50 years we'll have spent $25 million more dollars and we'll still have major mercury contamination in the waterway.

**Moderator**
You have about a minute left sir.

**Rodd Pemble**
In a hundred years we'll have spent $50 million and the waterway will still be polluted. In 500 years our community will have spent $250 million and the waterway will still be polluted with mercury.

$25 million coincidently is about the amount taxpayers would have to pay beyond cleanup funds from the state and other grants to completely cleanup the entire Whatcom Waterway and ASB now.

On a related, but critically unique note no one has yet described for me the organization who will be responsible for carrying knowledge of the mercury forward into the future, indefinitely, to prevent future generations from accidentally releasing mercury into the bay. We can't preserve societal information and standards for 100 years, how can we possibly manage it for 1,000 or 10,000? Who volunteers for the mercury priesthood? And who will pay their wages? 16

Do we think because we'll be dead and gone we shouldn't worry about it? Never mind the Log Pond cap is already failing after just 5 years. A pox on us, and I will say that again, a pox on us. If we blithely assume the future will take care of itself. We've buried almost the equivalent of spent nuclear fuel at our own front door. An environment that changes constantly and is subject to mass disruption. 18

Not only do these alternatives assume an infant technology, capping, will last forever but they have no guidance on how we're to remain on guard and careful for as long as humans and animals live upon this shore.

As a taxpayer, husband, father, businessman and boater common sense says cleanup all the poison now as best we can instead of relying on a technical fix and paying forever for monitoring and repair. If the doctor had the opportunity to remove all the cancer from your child or your spouse, would you choose to leave half of it and have them endure years of chemo because radical surgery would cost twice as much?

**Moderator**
Can I get you to summarize please?

**Rodd Pemble**
I'm on the way.

A truly clean waterway and ASB is the best gift, the only responsible gift this community can give to future generations. Our children's and their children's, seventy times seven generations. Or we can take the cheaper way out and saddle our descendents with an eternity of vigilance and expense for a problem we caused but couldn't bring ourselves to cleanup. What a sad commentary that would be to the generation of Washington leaders and citizens who cry "we must hold students accountable."

Twenty five years from now as we watch otters play along the banks of Whatcom Waterway some summer evening I want to be able to look my daughters in the eye and say I did my part. 17
So tax me my share of the extra money and for once let's get it right. Thank you. Rodd Pemble 2915 Cedarwood, Birchwood neighborhood in Bellingham.

| Commenter No. | Name / Organization |
|---|---|
| 110 | People for Puget Sound |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Dec 18, 2006 | Heather Trimm (Urban Bays Coordinator) |
| B | Public hearing transcript excerpts | Heather Trimm (Urban Bays Coordinator) |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | RI | General mercury concerns | Concerns over PBT status of mercury | 4.1 |
| 2 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 3 | FS | Capping effectiveness | General concerns over effectiveness | 5.2 |
| 4 | FS | Log Pond concerns | Concerns about Log Pond cap performance | 5.14 |
| 5 | FS | Cost accurancy | Sediment volumes & costs for waterway | 5.23 |
| 6 | FS | Project funding | Support for additional cleanup fundraising | 5.26 |
| 7 | FS | Additional habitat | Backfill after dredging for habitat | 5.22 & 6.10 |
| 8 | RI | Additional investigations | More data colleciton in waterway, Starr rock | 4.10 |
| 9 | RI | Natural recovery data | Adequacy of natural recovery data | 4.16 |
| 10 | RI | BSL basis | Fish consumption rates | 4.3 |
| 11 | FS | Climate change | Potential effects of sea-level rise | 5.6 |
| 12 | FS | Additional habitat | Desire for additional habitat during cleanup | 5.22 |
| 13 | FS | Disproportionate cost analysis | Presentation of public concerns | 5.25 |
| 14 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 15 | FS | Cost accuracy | Sediment volumes & costs for waterway | 5.23 |
| 16 | FS | Log Pond concerns | Concerns about Log Pond cap performance | 5.14 |
| 17 | FS | Climate change | Potential effects of sea-level rise | 5.6 |
| 18 | FS | Seismic concerns | Cap stability during earthquakes, tsunamis | 5.7 |
| 19 | RI | BSL basis | Fish consumption rates | 4.3 |
| 20 | FS | Project funding | Support for additional cleanup funding | 5.26 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

PEOPLE FOR PUGET SOUND
pugetsound.org

December 18, 2006 1

Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452
Via email: lpeb461@ecy.wa.gov

**RE: Draft Bellingham Bay Comprehensive Strategy – Whatcom Waterway Cleanup Site - Documents (RI/FS and SEIS)**

Dear Ms. McInerney,

Thank you for the opportunity to comment on the *Draft Supplemental Remedial Investigation/Feasibility Study (RI/FS)* and the *Draft Supplemental Environmental Impact Statement (EIS)* for Whatcom Waterway in Bellingham, Washington.

People For Puget Sound is a nonprofit, citizens' organization whose mission is to protect and restore Puget Sound and the Northwest Straits, including a specific goal to protect and restore the 2,000 miles of Puget Sound shoreline by 2015.

The Whatcom Waterway was polluted by industrial sources including the discharge of mercury-containing wastewater Georgia Pacific's former chlor-alkali plant as early as 1965. Although previous assessment and remediation plans were developed, a new set of documents have been produced because of the development of the Waterfront Futures Group Vision and Framework Plan accompanied by redevelopment plans led by the Port of Bellingham and the City of Bellingham.

People For Puget Sound advocates for a high quality cleanup of Whatcom Waterway
because of the impacts of persistent bioaccumaltive toxic (PBTs) chemicals such as 2
mercury on the foodweb of Puget Sound as well as on human health. PBTs are of special interest because they impact the recovery of endangered species in Puget Sound including Chinook salmon and Southern Resident Orcas.

People For Puget Sound supports the comments of RE Sources' North Sound Baykeeper.

Our additional comments follow:

1) *Dredging vs. capping.* People For Puget Sound strongly supports removal of PBTs by dredging or other methods from sediment sites in Puget Sound. We 1
support keeping contamination in place (i.e., capping) as a significantly less desirable option and only when pollutants can be safely left in place (such as a

side channel in a very low energy location).

There are significant concerns about the stability and protectiveness of a cap over a long time 2
period. We have only a short (20+ years) history of caps in Puget Sound. At this site, the log pond
cap – which was engineered to withstand local conditions – is already eroding less than 5 years 3
after construction. Barges and other vessels could break free in large storms (or due to human
error) and could ram into a cap in the waterway. Propeller wash is an issue. Finally, as stated in
the fact sheet, "MTCA regulations specify that when selecting a cleanup action, preference shall be
given to actions that are 'permanent solutions to the maximum extent practicable.'" The
practicable aspect does not appear to be fully explored for this site.

2) *Future use and range of options.* It appears that the RI/FS documents for this site have been #4-B
written to favor dredging for navigation (maintenance) and other uses rather than on the
contamination risks. That is, the dredging locations are selected for navigation and economic
reasons, not based on science. The alternatives are all presented in terms of the level of dredging
for navigational uses. Some of the highest levels of mercury, however, are proposed to be left in
place in most options, including the preferred options. We understand that the Port of Bellingham 4
and the City of Bellingham plan to redevelop the waterfront as part of the overall cleanup project.
This overall project has been budgeted to a certain level of funding. We, therefore, support a
public process to assess if other funds can be raised, perhaps from the community or from MTCA
funds, to conduct a more thorough cleanup.

In addition, an option is not presented that removes the hotspots and then fills the removed areas in 4
with clean sediment – an option that would allow for maximum habitat in the inner waterway. A
full range of options was not presented to the public – options that could occur beyond the
currently identified funding strategies.

3) *Additional characterization.* The head of the waterway and the Starr Rock areas need additional 5
assessment.

4) *Sedimentation rate.* Reviewing public comment letters and the cleanup documents, it appears that 6
much more work is needed to determine the actual sediment budget for the site. Given the
preference for capping and "natural recovery" at the site, this is a critical aspect of the proposed
project.

5) *Seafood consumption rates.* A stronger human health risk assessment is needed for this site. 1
Subsistence fish consumption rates were not used. Further, overall conditions, especially shellfish
environment, at the site should significantly improve as this site and others in Bellingham Bay are
cleaned up.

6) *Climate change.* The cleanup documents do not adequately address climate change. Current 3
models predict more intense storms for the Pacific Northwest. Scour and other impacts in the
waterway could be dramatically increased in the future.

7) *Habitat.* People For Puget Sound strongly supports a cleanup of the Whatcom Waterway that 4
maximizes habitat. As pointed out by the Lummi Indian Business Council, significant nearshore
habitat is needed in Bellingham Bay.

8) *Public opinion.* Based on comments at the public hearing, the quoted results from a recent Elway
Poll, and other comments, it appears that there is strong support for a more complete cleanup of

mercury than are offered as the preferred options. Public opinion aspects (including listings in tables) of the documents and fact sheets should be updated to reflect these comments. 2

hank you for your consideration. If you have any questions, please contact me at (206) 382-7007 or htrim@pugetsound.org.

Sincerely,

Heather Trim
Urban Bays Coordinator

13

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Heather Trim**
Well I'm no way as eloquent as that, or Dan David either. My name is Heather Trim I'm with People for Puget Sound. I'm out of our Seattle office. I'm our toxics lead which is why I'm here and not our local staff.

I want to first address public process. This meeting would not be held if Wendy had not raised 50 signatures to get this hearing to take place and I attend many, many public hearings and I rarely see this number of people at any hearing. So I really hope that for all future efforts here in Bellingham you will hold public hearings and not even have us have to do a process to get that to occur.

I also hope you can put the comments, these are great comments that are over here, and it would be very helpful for us to have these on the web as soon as possible. It's very easy to scan them in, I know that your public process person can do that, and there is information there that is not available in the documents that we see that are on the web right now.

People for Puget Sound's position on dredging vs. capping is that we prefer dredging. We want 14
to get the mercury and other contaminates out of the system.

Capping is a far second choice. Mercury is a persistent bioaccumulative toxin. It's in the system, we have, as well as for PCB's and other contaminants, we're circulating them around the system and it's time to just get rid of them.

As a previous speaker said this plan is, if you look at it, it is sort of based on dredging of
convenience. Where the dredging occurs has to do with navigational ease and other needs as 15
opposed to based on the science of where it actually gets the contaminates out, and I will address this issue of convenience and politics a little bit later in this comment.

Significant state monies are going towards this cleanup and navigational needs should not be considered as a cost of cleanup for this site, that's a separate pot of money. The governor is now pushing very hard to get Puget Sound cleaned up by 2020. This site and other sites in Bellingham Bay are part of that effort and we really need to do the right thing at this point. We need to make sure the money is accounted for properly.

I would not look at the Log Pond cap as a success as was previously stated. I have a bit of a different twist than the person who spoke about this generally before.

When that cap was proposed and engineered and all the public process went on with that cap.
The public at that time, I assume, was assured this is a great cap, it's engineered it's going to last 16
forever. When in fact, after 5 short years it is eroding. Therefore when you look at caps elsewhere in the system you have to really be skeptical about it. That after 5 years they won't also be in. So this engineering issue is a very challenging issue.

Climate change as was previously mentioned is something that's not really addressed very well 17
in these documents from what I've seen. One of the predictions from climate changes is more
intense rain storms.

Then the geological comments by the previous woman I think are very much in place. Tsunami's 18
– I don't think it's OK to say that if we have a tsunami we will be a lot worse contaminations here in Bellingham Bay. The mercury being sprayed all over the place will be a lot worse than say blowing up gasoline tanks and underground tanks, things that will volatilize. We really need to be concerned about the PBT's in this area and get rid of them and be worried about tsunamis

People for Puget Sound very much wants to see habitat as part of this plan. So therefore we're going to very much support those alternatives.

In terms of the fish consumption levels. I work a lot on the Superfund sites in the Duwamish and
there we are using a much larger consumption value – or flip it the other way risk value. I think
that the number should be used that is more reflective of tribal consumption rates, as well up 19
here.

I also think that we should clarify that this is not Ecology's plan. The PRP's wrote this plan and Ecology has basically had to react to that. You're in a position of having to react to a plan you were given. I think that if in fact you all were writing the plan it would be very different and very much stronger plan. I know Pete has, I don't know you Lucy, but Pete has a very long and good history at Ecology and I know that you would maybe have a bit of a different plan if you were going to be proposing it and I'll address that here which is this process is a political and economic process and it's interesting that I'm one of the last speakers here and in fact I haven't heard anyone speak in favor of keeping mercury in place in this site.

**Moderator**
You have about a minute left ma'am please.

**Heather Trim**
OK, I'm almost done.

In a site that I worked on in Seattle we did politicize the process further. We went to the port commissioners and said can you please clean this up better? I'm interested that the Port commissioners don't appear to be here. The two Mike's are here. I think if the community in fact is interested in having a better cleanup the Port and the community should work together to get that done. I think that Ecology would probably bless that. I'm sure that you guys – at least that's what happened at some other sites that Ecology and EPA would thrilled for better cleanups

So I think that it is worth it to lobby Olympia for more state money and also to raise the funds 20
locally. Thank you.

**Moderator**
Thank you. Mitch is up next and he is followed by Ethan.

Commenter No. | Name / Organization
---|---
111 | Pike, Dan

Commenter Submittals:

A    E-mail dated Dec. 18, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Capping effectiveness | Concerns over long-term cap stability | 5.2 |
| 2 | FS | Cap monitoring | Scope of long-term monitoring | 5.10 |
| 3 | EIS | Marina comments | Favors development of new marina | 6.8 |
| 4 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |

**Notes:**

EIS    Supplemental Environmental Impact Statement
FS    Feasibility Study (Volume 2 of Supplemental RI/FS)
RI    Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS    Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Dan Pike [mailto:pikeboynton@toast.net]
Sent: Monday, December 18, 2006 10:14 PM
To: McInerney, Lucy (ECY)
Cc: beddill@nas.com; info@bbayf.org
Subject: Comments on Whatcom Waterway RI/FS

Lucille T. McInerney
Washington State Department of Ecology
3190 160th Ave
Bellevue, WA 98008

Dear Ms. McInerney,

I am writing to enter my concerns into the record regarding the proposed Remedial Investigation/Feasibility Study (RI/FS) for the Port of Bellingham's Georgia Pacific Whatcom Waterway site. While I am not a working scientist, I have some understanding of 'remedial' and 'feasibility'. Put simply, in this particular instance, 'remediation' means 'clean-up', while 'feasible'
means 'affordable.' The key questions are, 'what is an effective clean-up?' and 'what can we afford to do-or not do?'

There are serious disagreements over whether the proposed clean-up
alternative will remediate in the longer term, given that much of the
offending material is left in place.
While the identified preferred
alternative suggests that capping will be sufficient to prevent
leaching of mercury compounds into the active ecosystem where they
might be converted into toxic methyl and ethyl forms. This perspective
seems penny-wise and pound-foolish. A cap is effective at best only so 2
long as it remains intact. There are many scenarios of natural and
human actions which would lead to cap failure, and consequent
revisitation of cleanup issues and health risks, at a greater cost
compounded by interim development of the area. At a minimum, this
calls for ongoing, active monitoring of the site, ensuring that costs 1
either never cease, or else that we play Russian roulette with the
health of ourselves, our children and our grandchildren- not to mention
the animal life throughout the ecosystem-by not monitoring a real risk.

It is possible I am misreading the potential risk involved. Competing panels of experts coming to grossly different conclusions can have that effect. However, this question is too important to leave unsettled. A short term savings resulting in greater long term environmental toxicity is no real savings. I would prefer to see a peer review of the perspectives offered by both the Ecology/Port of Bellingham/City of Bellingham team and the alternative understanding presented by the Bellingham Bay Foundation. While I am no fan of spending more scarce resources than needed to solve a problem, far worse is to spend resources of the scale proposed and, in the end, leave the problem largely intact for future generations to deal with.

As far as some of the other issues, which I view as secondary to the
clean-up issue, I favor development of the proposed marina in the ASB. 2
However, my support comes with a caveat from my past experience as a
commercial fisherman working out of Bellingham-any new marina needs to
be tied to the preservation of berth space for our current working

fleet. There has been pressure for years to provide more space for recreational boats, and this is an ongoing threat to maintaining a working fleet that is the heart of the Bellingham waterfront. 1

Thank you for considering my input into this process.

Sincerely,

Dan Pike
2411 D Street
Bellingham, WA 98225

| Commenter No. | Name / Organization |
|---|---|
| 112 | Polaris Leadership Solutions, Inc. |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Dec. 5, 2006 | Edward C. Starinchak (President) |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Land use changes | Support for land use changes | 6.6 |
| 3 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 4 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

POLARIS
LEADERSHIP SOLUTIONS INC.

#1-A

166 Hiline Road
Bellingham, WA 98229

December 5, 2006

Lucille McInerney
Site Manager Dept. of Ecology
3190 160th Avenue SE
Bellevue, WA 98008-5452

Dear Ms. McInerney:

Thank you for taking public commentary on the Whatcom Waterway Site. I am writing to share a point of view as a concerned Bellingham resident. The core question that is posed: What is the preferred cleanup alternative? When I reviewed the comprehensive evaluations of the EIS and RI/FS and reflected upon my own personal experience coaching leaders through large scale change projects, I concluded the only true alternative is Alternative 6. My rationale is simple but hopefully compelling: 1

Finding the "best" alternative amongst competing polarities is challenging to say the least. A task personally I do not envy your leadership. But this is what leadership is for, isn't it--to give voice to confusion and to help inform a community so that the most viable solution serves the greatest good. I do believe a clear path forward is emerging across options 1-8. And, it is my contention that serving the greatest good is a matter of choosing a course that is also the <u>most</u> SUSTAINABLE, when considering all facets.

I feel alternative 6 most thoroughly balances multiple polarities; namely,

- the *sustainability of our environment,*
- the *sustainability of our economy,*
- the *sustainability of our community,*

all while honoring Bellingham's rich maritime heritage. It doesn't just create a win-win...but a triple win concerning the business of sustainable development.

It is my contention that none of these other Alternatives seem to balance competing forces quite as robustly as Alternative 6. Allow me to give some a personal experience that helped shaped my perspective.

Years ago, I had the privilege to help facilitate a change effort at Nike to produce consumer products which factored in "cradle to grave" considerations. No longer did this venerable shoe giant feel it a responsible business practice to overlook what happened to a "sneaker" in a landfill. Many thought leaders were tapped, including Dr. Karl-Henrik Robert and The Natural Step (TNS). Aside from profound personal impact, his "systems conditions" laid out our core practices influencing designers, merchandisers, and production alike. It was our perspective that contemporary life is fundamentally supported by natural processes. These processes are essential to maintaining human life. However, as a society we are systematically altering the ecosystem structures and functions that provide life-supporting services. Like their controversial style or hate them Nike was pursuing a "triple bottom line" (people, planet, profit) strategy.

Influencing our thinking, the following four Natural Step system conditions are supported by scientific knowledge that ecosystem functions and processes are altered when:

1. Nature is subject to concentrations of substances extracted from the Earth's crust, **Society mines and disperses materials at a faster rate than they are redeposited back into the Earth's crust (examples of these materials are oil, coal, and metals such as mercury);**

2 Nature is subject to concentrations of substances produced by society, or **Society produces substances faster than they can be broken down by natural processes, if they can be broken down at all (examples of such substances include dioxins, DDT, and PCBs);**

3. Nature is degraded by physical means; or **Society extracts resources at a faster rate than they are replenished (e.g., over harvesting trees or fish), or by other forms of manipulation (e.g., paving over fertile land or causing soil erosion);**

4. People are subject to conditions that systematically undermine their capacity to meet their needs; or **basic human needs need to be met through fair and efficient use of resources** or it will be difficult to meet conditions 1-3 on a global scale.

My goal is not to advocate or comprehensively review the Natural Step, but it did influence my consultancy at Nike and it does influence my perspective related to the Whatcom Waterway.

Condition 1 & 2 has been violated by GP. The Port and our community have assumed responsibility to deal with this clean up. We have a chance to proactively manage Condition 3 by our choice on how we proceed with clean up and development. More specifically what does this have to do with Alternative 6?

Whether factoring Dr. Robert's conditions for sustainability into our product considerations or applying them to Bellingham Bay revitalization, I submit they still apply and have profoundly influenced thousands who are concerned about our futures. Mercury after all is a heavy metal that was taken from the earth and will return to the earth. Though not a scientist, I'll defer to the experts on this one, but the practice of capping and dredging seems like the most prudent approach to managing such hot spot concentrations and very consistent with this layperson's knowledge of TNS. Since there is "no away" for these metals the ability to contain concentrations and return them whence they came is our most prudent course, as Alternative 6 helps manage. Finally, I find it wholly consistent with system condition 4 to provide for equitable and fair use of our natural resources. Though we are not talking about a global issue here, we can start by walking our own talk in our back yard when considering socio-economic impacts.

Last but not least, let us consider the socio-economic polarity as I feel this is a differentiator to other considerations. Large natural resource intense employers are going by way of the dinosaur as scarcity increases, new technologies emerge, and global trade enables alternatives. Everywhere you look the Old Economy is being replaced by the New Economy. By consideration of an approach that calls for revitalization of our 2
waterfront through multi-use marina, parks, residential, retail, and various commercial facilities, a strong economy helps ensure a strong community. Taxes, public gathering places for families, recreation venues, and new jobs all add up to a vibrant waterfront.

We can make it particularly sustaining by leveraging the unique geographic location of 1
our city. In particular using the ASB lagoon for planned aquatic reuse as a marina with integrated public access differentiates Alternative 6 from the narrower approaches considered such as Alternative 3. For those who portray themselves as "environmentally aware," I also assume they are aware of the standard to reduce, reuse, and recycle. A marina, for example, not only would provide park land and public access but would also bring in needed new jobs through ecotourism, shipping, repair, and services. Let us also not forget the creation of forum for ongoing ecological awareness through educational activities. I can go one, but the debate needs channeling to intelligent usage of such a resource that already exists. The fact remains that marina access up and down the coast remain a premium and will only continue as the population grows. Ensuring Bellingham's future through its unique, breathtaking location ensures an exciting community now and into the future. Simply put, we have some of the most breathtaking waterways on this planet. Any actions that maximize responsible marine use honors our past and sets a prudent future course for a SUSTAINABLE community.

From my perspective, the choice is clear. Alternative 6 is Ecology's preferred option because it does the best job of balancing many sustainable solutions. When one 2
considers the collective environmental, economic, and societal impacts other choices swing the pendulum too far and fall short. What we need from all of us is more BOTH/AND thinking and less EITHER/OR thinking when weighing our complex decisions against such polarities--such as how to best proceed with Whatcom Waterway. I have faith, however, that your leadership will indeed make the most balanced choice for our community: Alternative 6 is THE SUSTAINABLE choice.

Sincerely,

Edward C. Starinchak, Ph.D.

President, Polaris Leadership Solutions Inc.

Commenter No. 113 — Name / Organization: Port of Bellingham

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Dec. 5, 2006 | James Darling (Executive Director) |
| B | Resolution No. 1241 | Port of Bellingham Commissioners |

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 3 | EIS | Land use changes | Support for land use changes | 6.6 |
| 4 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 5 | EIS | Navigation changes | Support for multi-purpose waterway | 6.7 |
| 6 | FS | Project funding | Funding plan for Alternative 6 | 5.26 |
| 7 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

#1-A

PORT OF BELLINGHAM
Washington State

December 5, 2006

Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Re: Whatcom Waterway Site

Dear Ms. McInerney:

Please find enclosed Resolution #1241 by the Commission of the Port of Bellingham, recommending Alternative 6 for selection by the Department of Ecology as the cleanup action plan for the Whatcom Waterway site under the Model Toxics Control Act.

As described in the resolution, Alternative 6 ranks highest under the applicable regulatory criteria outlined in the October 10, 2006 Remedial Investigation and Feasibility Study for the Whatcom Waterway site, and would provide a safe and effective cleanup, consistent with the current land use planning by the Port and City or Bellingham for the waterfront. 1

We at the Port look forward to our ongoing partnership with you and the Department of Ecology as we move forward on the cleanup of the Whatcom Waterway. Please feel free to contact me, should you have any questions about the Port's position.

Sincerely,

James S. Darling
Executive Director

Enclosure

1801 Roeder Avenue / P.O. Box 1677 / Bellingham, WA 98227-1677
(360) 676-2500 / FAX (360) 671-6411 / www.portofbellingham.com

2

**RESOLUTION NO. 1241**

**A RESOLUTION OF THE COMMISSION OF THE PORT OF BELLINGHAM, RECOMMENDING PREFERRED ALTERNATIVE NO. 6, AS DESCRIBED IN THE OCTOBER 10, 2006 DRAFT SUPPLEMENTAL REMEDIAL INVESTIGATION AND FEASIBILITY STUDY FOR THE WHATCOM WATERWAY SITE, TO THE WASHINGTON STATE DEPARTMENT OF ECOLOGY.** 3

**WHEREAS**, the Port of Bellingham ("Port") and the Washington State Department of Ecology ("Ecology") have been working together since 1996 as co-managers of the Bellingham Bay Demonstration Pilot; and

**WHEREAS**, following closure of the local Georgia-Pacific pulp mill operations in
2001, the Port and the City of Bellingham have been working together to revitalize the #4-B
waterfront by supporting a new mix of uses including light industry, business, academic, residential, moorage, public access, and habitat restoration; and

**WHEREAS**, in January 2005, following an extensive public involvement process, the Port acquired 137 acres of waterfront property from Georgia-Pacific, including significant areas of the Whatcom Waterway site such as shorelines, the Log Pond and the Aerated Stabilization Basin, in order to implement the community's vision for revitalizing the waterfront; and

**WHEREAS**, through interlocal agreement, the Port and City of Bellingham have
determined that the most appropriate re-use of the Aerated Stabilization Basin is for a 4
"Clean Ocean Marina", including public access, marine habitat and expanded moorage capacity; and

**WHEREAS**, in November 2005 the Port and the Washington Department of
Natural Resources agreed in a Memorandum of Understanding that the current 4
Whatcom Waterway federal channel, state waterway and harbor area designations should be updated to better reflect the current changes in the local economy, land uses, land use plans and navigation needs for the community waterfront; and

**WHEREAS**, the Port, as local sponsor for the Whatcom Waterway federal channel, has recommended that the channel be maintained adjacent to the Bellingham Shipping Terminal to support deep draft operations, but converted to a locally managed multi-purpose waterway in the inner portion of the channel; and

**WHEREAS**, the Port and Georgia-Pacific have entered into an Agreed Order with Ecology to update the Remedial Investigation/Feasibility Study ("RI/FS") and Environmental Impact Statement ("EIS") for the Whatcom Waterway site in order to reflect the results of recent sampling investigations, improving environmental conditions, changes in property ownership and the development of new waterfront land use plans; and

**WHEREAS**, the updated RI/FS and EIS for the Whatcom Waterway site have been issued for public comment by Ecology with Alternative 6 identified as one of the "preferred" alternatives, because it ranks highest under the applicable regulatory criteria, and would provide a safe and effective cleanup, consistent with the current land use planning by the Port and City of Bellingham to revitalize the waterfront, according to the community's vision; and

**WHEREAS**, the estimated cost of Alternative 6 is $44 million, for which the Port 2
has a viable funding plan, supported through multi-million dollar state grants which have been identified as a priority by both the Department of Ecology and the Governor of the State of Washington.

**NOW, THEREFORE, BE IT RESOLVED** by the Board of Commissioners of the Port of Bellingham, Washington, that Alternative 6 is recommended for selection by the
Department of Ecology as the cleanup action plan for the Whatcom Waterway site under 1
the Model Toxics Control Act.

**ADOPTED** in open session at a meeting of the Commission of the Port of Bellingham on the 5th day of December 2006, and duly authenticated by the signatures of the Commission and the seal of the Commission affixed hereto.

PORT OF BELLINGHAM COMMISSION

Jim Jorgensen, President

Scott L. Walker, Vice President

Douglas G. Smith, Secretary

| Commenter No. | Name / Organization |
|---|---|
| 114 | Post, David |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 18, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Cap monitoring | Length & type of cap monitoring | 5.10 |
| 3 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 4 | FS | Residuals & water quality | Short-term exposures during removal | 5.16 |
| 5 | FS | Project funding | Favors additional taxes to support cleanup | 5.26 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A



From: David Post [musicpostjams@yahoo.com]
Sent: Monday, December 18, 2006 2:18 PM
To: McInerney, Lucy (ECY)
Subject: waterfront plans

Dear Lucille T. McInerney,

I strongly urge you to permanently remove the
Bellingham waterfront's mercury through a targeted, 1
state-of-the-art process. While capping may seem
safer in the short term, mercury is forever. To leave
it there would be irresponsible. We must remove this
mercury in the very safest way possible, sparing no
expense. Leaving it there will not only cause a health
risk for the next few generations, but also for
thousands and thousands of generations to come.

In lieu of removing the mercury, if we cap, we must 2
have a very systematic and thorough system for
monitoring the effectiveness of the cap, with a large
enough fund to monitor and provide repairs as 1
necessary.

In the long term, it may be more cost effective to
simply remove the mercury now, rather than deal with
the negative effects of having it there for the rest
of time.

While capping may seem less expensive and intrusive
initially, we cannot predict the real cost of capping,
over the long term. The mercury levels will certainly 2
spike when we remove the substance, but it is unlikely
that this will last any longer than the mercury spikes
which have already occurred when GP was running. In
the bigger picture, we must protect the citizens of
Bellingham from this extremely long-term environmental
risk. Please, on the behalf of my family and
generations to come, remove the mercury thoroughly and
with the best technologies that currently exist, at
any cost. I, as well as others, would be willing to 3
pay an annual fee towards this long-term solution to
the problem. Thank you for your time in considering
this important matter.

Sincerely,

David Post

Bellingham, WA

David Post
Artistic Director, Bellingham Arts Academy for Youth

www.baay.org

e-mail: david@baay.org
phone: 360-306-1543
address: 301 S. Garden St.
Bellingham, WA 98225

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Commenter No. | Name / Organization
115 | Poynter, Keith

Commenter Submittals:

A | E-mail dated Dec. 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |
| 2 | EIS | GP site ownership | Ownership of GP site purchased by Port | 6.3 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Keith Poynter [mailto:kpoynter@odysseynw.com]
**Sent:** Saturday, December 16, 2006 11:28 AM
**To:** McInerney, Lucy (ECY)
**Cc:** Keith Poynter
**Subject:** Waterway Cleanup

To: Whom it May Concern
CC: Lucy
Date: 12/14/06

I am writing as a new homeowner in Bellingham to express my concern over what appears to be a grand lack of foresight by our community leaders. That the City of Bellingham is not taking a firmer stand with the Port is absurd. What the Port is proposing for cleanup is just beyond the minimal and basically is an attempt to look good to those citizens that are too busy to really follow the details. The Port likely recognizes that most people in the community are not savvy enough to really get the scientific studies and understand the long term impacts of the decision. Of course, based on what the Port is recommending it appears that they are in the same boat. My hope is that they are making their decision out of ignorance and not based on financial gain/losses. Yet, either way it is essential that concerned citizens with the time, money, and expertise make certain that the bull the port is trying to float doesn't make it out of its slip.

It should be clear that this process of developing the waterfront will take years. Thus, though the City and County will likely strike out in upcoming negotiations and bend to the Port - the struggle to make certain that our waterway is as clean as we can make it 1
will go on! Public out cry will get louder as more and more people deal with the effects of a toxic ecosystem. Lawsuits will be in the works and the hurried decision that we make today will cost us more tomorrow. Ah, the American way - live for today and forget what comes next! I had thought Bellingham would be different, progressive, and yet it appears to now be on the brink of selling it's soul so that BIG boats with BIG money can have a place to sleep. Our goal as a community should be NOTHING LESS than to be able to one day look our children's children in the eyes and tell them that we did absolutely EVERYTHING in our power to clean up the toxins we helped put in the water. Anything less is as much a crime as the initial polluting and will rest heavy on us and future generations.

This decision before us is monumental. It paves the way for kind of community we are to become. I urge anyone with a vote in this matter to make it clear to the Port that though they purchased the GP site - they do not own it. The public does! We don't wish to 2
sacrifice our health anymore for the bottom line. Get it right this time!

Sincerely,
Keith E. Poynter
2712 Russell Street
B'ham WA 98225
360-733-9240

Commenter No. | Name / Organization
---|---
116 | Pratum, Tom

Commenter Submittals:

A E-mail dated Dec. 18, 2006

B Letter dated Dec. 17, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | RI | Natural recovery | Adequacy of natural recovery data | 4.6 |
| 2 | RI | Additional investigations | Need for additional natural recovery data | 4.10 |
| 3 | RI | BSL basis | Development of BSL, Fish consumption rates | 4.3 |
| 4 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 5 | FS | Capping effectiveness | Concerns over long-term effectiveness | 5.2 |
| 6 | RI | Mercury leachability | Potential migration of capped mercury | 4.7 |
| 7 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 8 | FS | Cap design | Favors use of reactive capping | 5.8 |
| 9 | FS | Project permitting | Favors public review during design process | 5.27 |

**Notes:**

EIS Supplemental Environmental Impact Statement

FS Feasibility Study (Volume 2 of Supplemental RI/FS)

RI Remedial Investigation (Volume 1 of Supplemental RI/FS)

RS Responsiveness Summary (Narrative)

-----Original Message-----
From: Tom Pratum [mailto:tkpratum@romarr.com]
Sent: Monday, December 18, 2006 2:03 PM
To: McInerney, Lucy (ECY)
Subject: Whatcom Waterway Cleanup Comment

Lucy-
Please include the attached comment in the record for the Whatcom Waterway Cleanup.
Thank you.

Tom Pratum
2241 North Shore Road
Bellingham, WA 98226

1

December 17, 2006

Lucille T. McInerney, P.E.
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue SE
Bellevue, Washington 98008-5452
E-mail: lpeb461@ecy.wa.gov

Re: Bellingham Bay Comprehensive Strategy – Whatcom Waterway Cleanup Site.

I have the following comments on the proposed action by the Port of Bellingham to cleanup the Whatcom Waterway:

- The proponent's preferred cleanup plan contains a mix of cleanup modes: natural recovery, dredging and capping. The plan leans heavily on natural recovery, and 2
presents a scenario in which much of the natural recovery has already occurred. I 1
feel that there is insufficient sediment sampling to make this statement.

- In determining the safe sediment mercury level, the proponent develops a Bioaccumulative Screening Level (BSL). This level is conveniently above that required for chemical cleanup (MCL). In the derivation of the BSL, there are many assumptions regarding the uptake of mercury (Hg) that are then extended progressively to organisms higher and higher on the food chain, until they are used to extrapolate the level of Hg present in a human who consumes seafood from the area on a subsistence basis. The fallacy of the BSL calculation in the documents can be seen as follows: The BSL is determined (RI Appendix E), using assumptions that are certainly open to question, to be 1.2, and the regression line between sediment Hg and tissue Hg is determined to be: tissue Hg = 0.116 x + 0.047; where x represents sediment Hg. Using the data presented on seafood consumption of subsistence tribal members, a 70 kg human may consume 173 2
gms/day of crab if only crab is consumed. If this crab all came from an area with a sediment Hg level at the BSL, it would result in about 4.6 times the EPA's reference dose (RfD) for Hg. At a minimum, the statement that appears on page 4-6 of the RI: *"Because of the conservatism of the assumptions on which the BSL was developed, the BSL is protective of human health even if one or more of the underlying assumptions were to change significantly."* is not correct, and misleads the public regarding the human health safety factor for any proposals evaluated therein.

- The proponent proposes, in their preferred alternatives (5 & 6), to dredge a number of areas, including the ASB. I strongly support dredging of these areas and 3
the ASB, so that the ASB may be returned to have some aquatic and shoreline habitat value. Based on my comments below regarding capping, I feel the proponent should try to incorporate more remediative dredging in place of MNR

and capping (as in alternatives 7 and 8). Dredging using silt curtains and/or sheet pile may be safer than the proponent has indicated, and could reduce the likelihood that contaminated sediment redistribution would occur.

- In a number of areas, the proponent proposes to cap with 3 to 6 feet of sediment. The actual design of the caps is not discussed in detail, but the following comments can be made:
    - Capping is defended as an appropriate remediation method in part based on the performance of the Log Pond cap. This cap has performed to some degree, but it has not demonstrated excellent performance. Subsurface sediment samples show low Hg concentrations, but some surface sediment samples show an increase in Hg over the 5 year sampling period. The reason for this is not adequately explained – it must result from contaminated sediment redistribution, or advective transport of Hg species to the sediment surface. While the RI dismisses advection as a transport mechanism, the support for this in the document is very weak. From these observations, capping may not be appropriate for broad application and should be investigated further. Additionally, reconsideration of the Log Pond cap as a permanent solution to the contamination in this area should be undertaken (perhaps dredging in this area is needed). #4-B 4 4
    - Related to the above comment, in the FS, reactive capping technologies, which would help contain Hg transported into the cap, are dismissed. Given that advective effects may indeed be appropriate, reactive capping technology should be considered in instances where capping is deemed appropriate. 5
- Given that the performance of dredging and capping remediation depends strongly on the technology used, I feel very strongly that the design phase of this project should be open to public review. 6

Thank you for your consideration.

Sincerely,

Tom Pratum
2241 North Shore Road
Bellingham, WA 98226

Commenter No. Name / Organization
117 Puget Sound Action Team

Commenter Submittals:
A Letter dated Dec 14, 2006 Brad Ack (Director)

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | RI | Source control | Potential recontamination from stormwater | 4.9 |
| 2 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | EIS | Comprehensive strategy | Favors updating of Comprehensive Strategy | 6.11 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

STATE OF WASHINGTON
PUGET SOUND ACTION TEAM
OFFICE OF THE GOVERNOR
*P.O. Box 40900 • Olympia, Washington 98504-0900*
*(360) 725-5444 • (360) 725-5456*

December 14, 2006

Ms. Lucille T. McInerney
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, Washington 98008-5452

Dear Ms. McInerney:

Thank you for the opportunity to comment on the October 10, 2006 Draft Remedial Investigation/Feasibility Study (Draft RI/FS) for the Whatcom Waterway Site. The Puget Sound Action Team (PSAT) has responsibility for defining, coordinating and helping to implement Washington's environmental agenda for Puget Sound. The Action Team works through a partnership structure, including a chair appointed by the governor, directors from 10 state agencies and representatives from tribal, federal and local governments with direct responsibilities and authorities for conservation and restoration of Puget Sound. This letter is provided in my role as Director of the Puget Sound Action Team staff rather than as chair of the partnership.

The comprehensive approach established by the Bellingham Bay Pilot Project to combine sediment cleanup, source control, sustainable land use and habitat restoration is unique in Puget Sound. The Puget Sound Action Team has been a party to the Pilot Project since its inception and is pleased to see a critical component of the work being moved forward with the issuance of the Draft RI/FS for Whatcom Waterway. Congratulations to you and your team for your considerable efforts in developing the Draft. Please accept the following comments for both documents.

- RI Section 6-3. This section states that no ongoing sources have been identified that have the potential to affect water or sediment quality beyond the immediate discharge zone of stormwater and industrial outfalls. Recontamination at sediment cleanup sites as a result of stormwater runoff has been an issue elsewhere in Puget Sound (for example, Commencement Bay). We recommend that additional analysis of existing and proposed stormwater management activities and programs be done, and needed follow-up actions completed, to ensure that recontamination will not occur. Better documentation of source control from upland sites should also be included. 1

- FS Section 7-3. It is not clear that long-term maintenance costs are factored into the remedy costs component of the MTCA Disproportionate Cost Analysis. We recommend 2
that it be included so that cost comparisons are more accurate.
- FS Section 6. We support alternatives that:
    - Use upland disposal sites for contaminated sediments. (Alternatives 3-8)
    - Excavate the navigation channel anywhere it will be dredged in the future to 1
provide for clean sediment at (and slightly below) the navigation depth since future maintenance dredging will probably involve some over-dredging.
    - Maximize preservation and enhancement of existing habitat conditions (Alternatives 5 and 6 appear to do this best; Alternatives 1 and 4 are next best)

Finally, we recommend that the Bellingham Bay Implementation Action Team review the data used in the environmental characterization section of the RI document and identify 1) areas where updated information is currently available and 2) key data that needs to be collected prior to implementation of the cleanup actions. Some conditions have changed (for example, eelgrass 2
has been identified in the log pond since the initial characterization was completed) that need to be factored in. Other information that may warrant updating as the comprehensive plan is implemented include:

- Surface water and circulation patterns (Section 3-5).
- Net current drift (Section 3-3).
- Circulation patterns (Section 3-7).
- Surf smelt and sand lance spawning habitats (Section 3-24).
- Salmonoid use of Bellingham Bay (Section 3-24).
- Marine bird use of Bellingham Bay (Section 3-26).

Thank you again for the opportunity to comment on the Draft RI/FS. If you have any questions regarding our comments, please feel free to contact Hilary Culverwell, liaison to Whatcom County and a member of the Bellingham Bay Implementation Action Team at 360-676-2233 or hculverwell@psat.wa.gov.

Sincerely,

Brad Ack
Director

cc: John Dohrmann, Puget Sound Action Team
Hilary Culverwell, Puget Sound Action Team

Commenter No. Name / Organization
118 Raasch, John

Commenter Submittals:
A E-mail dated Dec. 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

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#1-A

**From:** John Raasch [mailto:john@mindfly.com]
**Sent:** Thursday, December 14, 2006 3:34 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms McInerney,
I am a Whatcom County resident that frequents Bellingham Bay. I have reviewed the draft RI/FS and EIS documents for the Whatcom Waterway Site. I am in support of the preferred alternatives 5 and 6 as they are currently documented. Thank you for your time and commitment to the future of the area. 1

Regards,

John Raasch
Mindfly Inc.
215 West Holly St.
Suite H22
Bellingham, WA 98225
360-647-7470 x 1# Phone
707-221-0553 Fax

www.mindfly.com

**John Raasch, Project Management**
Mindfly Web Design & Development
215 Holly Street, Suite H 22
Bellingham, WA 98225
360.647.7470 extension 1#
707.221.0553 FAX

Commenter No. | Name / Organization
---|---
119 | Radtke, BW

Commenter Submittals:

A Letter dated Dec. 13, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Seismic disturbance | Potential earthquake disturbances to caps | 5.7 |
| 3 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| | | | | |

**Notes:**

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#1-A

RADTKE
4188 Aukar Park Dr 107
Bellingham, WA 98226

Ms. Lucille McInerney
Dept. of Ecology
3190 160th Ave.
Bellevue, WA
98008-5452

98008T5452

13 December 06

Dear Ms. Mc Inerney:

I want to speak against the
Port of Bellingham's plan to cover 2
the mercury sediments in Bellingham 1
Bay. I am concerned about earthquake
damage to such a procedure. Mercury
needs to be removed! Thank you. 2

Sincerely,

B W Radtke

<u>Commenter No.</u> <u>Name / Organization</u>
120 Rangel, Mary Anne

<u>Commenter Submittals:</u>
A Letter dated Dec 12, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Cost accurancy | Sediment volumes & costs for waterway area | 5.23 |
| 3 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
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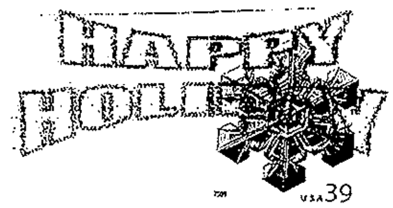
RS Responsiveness Summary (Narrative)

#1-A

MaryAnne Rangel
251 South Garden
Bellingham, WA 98225

EVERETT WA 982
12 DEC 2006 PM 2 L




Licille T. McInerey
Site Manager, Dept. of Ecology
Northwest Regional Office
3190 160th Avenue
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98008+5452

Mary Anne Rangel
251 South Garden
Bellingham, WA 98225

December 12, 2006

Lucille, T. McInerney, Site Manager, Department of Ecology
Northwest Regional Office
3190 160th Avenue, Bellevue, WA, 98008-5452

Dear Ms. McInerney;

The governor of Washington has recently stressed the importance of cleaning up Puget Sound. Here in Bellingham, we have an issue that relates to just that, the Whatcom Waterway cleanup.

The current alternatives in the RI/FS, both of which call for l capping mercury and other contaminated sediments in the inner portions of the waterway, are unacceptable.

The best way to ensure public confidence in the long-term protectiveness of the cleanup 1
is to remove the mercury and other contaminates, not to bury them. We don't want to
have to do this again. Any dredging of the inner portions of the Whatcom Waterway
should be premised on the goal of removing mercury, not on preserving the deep-water 2
shipping channel.

Mercury is forever. Any cleanup plan that caps mercury must be monitored forever and
will cost millions of dollars. We should pay the cost now, whatever it is, to remove the 1
mercury so that we never have to deal with this problem again. We got this property
from GP. They didn't have to cleanup the mess, we do and we should do it right.
Removal is the only alternative we have that is right for now and for the future.

Thank you.
Mary Anne Rangel

Mary Anne Rangel
rangelm@wwu.edu

Commenter No. | Name / Organization
---|---
121 | Reisman, Barbara

Commenter Submittals:

A E-mail dated Dec. 18, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

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- RS Responsiveness Summary (Narrative)

#1-A

**From:** Barbara Reisman [mailto:reisperson@gmail.com]
**Sent:** Monday, December 18, 2006 11:30 AM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway clean-up

Barbara Reisman
617 W. Horton Way #207
Bellingham, WA 98226

Lucy McInerney
WA State Dept. of Ecology
Olympia, WA
December 18, 2006

Dear Ms. McInerney,

Please count me as one who is firmly in the camp that believes that the city and port of Bellingham should NOT be allowed to cap and leave mercury deposits in the Whatcom Waterway. I moved to Bellingham in July and immediately began to follow articles about the proposed clean-up of the old G-P mill site, and what I have read has shocked and sickened me. Wouldn't it be wiser to make sure that future residents are not literally 1
sickened from the effects of the mercury left behind?
I won't repeat all the reasons why I am opposed to the city/port plan contained in Alternative 6, and why I support Alternative 3, which would use the ASB to contain the dredged sediments, because these reasons have been thoroughly documented in many places, and I have nothing new to add.
What I want to repeat, as so many of this city's concerned citizens have already said, is that the Department of Ecology has as its first responsibility to protect the environment, and should order the city and port to clean up and take away these potent toxins, and not leave them for future generations to have to deal with.
Thank you for your careful consideration on this critical issue. I hope that Ecology is looking at the long-term health of the many, and not merely at the short-term benefits to a few.

Barbara Reisman

| Commenter No. | Name / Organization |
|---|---|
| 122 | RESources |



Commenter Submittals:

| | | |
|---|---|---|
| A | E-mail dated Dec 18, 2006 | Wendy Steffensen (North Sound Baykeeper) |
| B | Attachment to Dec. 18th E-mail | Wendy Steffensen (North Sound Baykeeper) |
| C | Written comments (undated) | Wendy Steffensen & Public Participation Panel |
| D | Crab Tissue Testing Data | |
| E | Letter dated Dec 8, 2006 | Environment International Ltd (RESources Consultant) |
| F | Public hearing transcript excerpts | Wendy Steffensen (North Sound Baykeeper) |
| G | Public hearing transcript excerpts | Robin Dupre (RESources Member) |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS/EIS | Additional habitat | Favors development of habitat in place of ASB | 5.22 & 6.9 |
| 3 | RI | Cleanup levels | SMS criteria applied to subsurface sediments | 4.2 |
| 4 | RI | Additional investigations | Discussion of potential data gaps | 4.10 |
| 5 | FS | Unit 3A cleanup | Favors additional cleanup in Unit 3A | 5.21 |
| 6 | FS | Wind & wave erosion | Potential wave erosion in Starr Rock area | 5.3 |
| 7 | FS | Disproportionate cost analysis | Concerns about alternatives analysis results | 5.25 |
| 8 | RI | Cleanup levels | Protectiveness of SMS bioassays | 4.2 |
| 9 | RI | BSL basis | Concerns about protectiveness of BSL | 4.3 |
| 10 | FS | Cap design | Preference for use of thick capping | 5.8 |
| 11 | RI | Bioactive zone thickness | Concerns over thickness of bioactive zone | 4.14 |
| 12 | FS | Cap design | Preference for use of thick capping | 5.8 |
| 13 | FS | Cap design | Preference for use of thick capping | 5.8 |
| 14 | FS | Wind & wave erosion | Potential wave erosion in Inner Waterway | 5.3 |
| 15 | FS | Wind & wave erosion | Concern about storm surges | 5.3 |
| 16 | FS | Seismic disturbance | Potential cap disturbance during earthquakes | 5.7 |
| 17 | FS | Cap design | Capping near pilings or on steep slopes | 5.8 |
| 18 | FS | Log Pond concerns | Concerns about Log Pond cap performance | 5.14 |
| 19 | FS | Cap design | Capping stability on steep slopes | 5.8 |
| 20 | FS | Navigation disturbances | Need for additional analysis of prop wash | 5.4 |
| 21 | FS | Natural recovery effectiveness | Favors capping in place of natural recovery | 5.15 |
| 22 | RI | Source control | Concerns about chlor-alkali source control | 4.9 |
| 23 | RI | Additional investigations | Favors additional sampling in Log Pond | 4.10 |
| 24 | RI | Source control | Concerns about chlor-alkali source control | 4.9 |
| 25 | FS | Log Pond concerns | Concerns about Log Pond cap performance | 4.14 |
| 26 | RI | Source control | Concerns about chlor-alkali source control | 4.9 |
| 27 | RI | Water quality | Concerns about mercury leachability | 4.7 |
| 28 | FS | Log Pond concerns | Concerns about Log Pond cap performance | 5.14 |
| 29 | FS | Recontamination & water quality | Sheet piling to control dredging disturbances | 5.16 |
| 30 | FS | Disproportionate cost analysis | Concerns about alternatives analysis results | 5.25 |
| 31 | FS/EIS | Additional habitat | Backfill of deep dredge areas for habitat | 5.22 & 6.10 |
| 32 | EIS | Alternative ASB uses | Favors use of ASB area for habitat restoration | 6.9 |
| 33 | FS | Water quality | Sheet piling to control dredging disturbances | 5.16 |
| 34 | FS | Institutional controls | Concerns about adequacy of controls | 5.28 |
| 35 | FS | Disproportionate cost analysis | Expression of relative risk of contaminants | 5.25 |
| 36 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 37 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 38 | FS | Disproportionate cost analysis | Expression of public concerns | 5.25 |
| 39 | FS | Project funding | Favors additional taxes for additional cleanup | 5.26 |
| 40 | FS | Disproportionate cost analysis | Concerns about alternatives analysis results | 5.25 |
| 41 | RI | Cleanup levels | Roles of SMS & BSL in site cleanup | 4.2 |
| 42 | RI | Cleanup levels | Accuracy of bioassays | 4.2 |
| 43 | RI | Cleanup levels | Concerns about bioassay interpretations | 4.2 |
| 44 | RI | Natural recovery | Consistency of natural recovery across site | 4.6 |
| 45 | RI | BSL basis | Site-specific bioaccumulation testing | 4.3 |

| Commenter No. | Name / Organization |
|---|---|
| 122 | RESources |



| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 46 | RI | Bioactive zone thickness | Thickness of bioactive zone | 4.14 |
| 47 | RI | Seafood consumption rates | Protectiveness of seafood consumption rates | 4.3 |
| 48 | RI | General mercury concerns | Discussion of mercury toxicity data | 4.1 |
| 49 | RI | Seafood quality | Discussion of crab tissue data | 4.4 |
| 50 | RI | Seafood quality | Summary of RESource crab tissue data | 4.4 |
| 51 | RI | BSL basis | Concerns about protectiveness of BSL | 4.3 |
| 52 | RI | Seafood quality | Discussion of crab tissue data | 4.4 |
| 53 | RI | BSL basis | Regression analysis discussion | 4.3 |
| 54 | RI | Seafood quality | Variability of tissue data | 4.4 |
| 55 | RI | BSL basis | Regression analysis | 4.3 |
| 56 | RI | BSL basis | Clam and mussel regression data | 4.3 |
| 57 | RI | BSL basis | Averaging of crab data in regression analysis | 4.3 |
| 58 | RI | BSL basis | Fish consumption rates | 4.3 |
| 59 | RI | Seafood quality | Concerns about mercury in salmon tissue | 4.4 |
| 60 | RI | BSL basis | Consumption rates for different seafood types | 4.3 |
| 61 | RI | BSL basis | Proposal to modify BSL basis | 4.3 |
| 62 | RI | BSL basis | Proportion of methylmercury in crabs | 4.3 |
| 63 | RI | BSL basis | Comments about assumed diet fraction | 4.3 |
| 64 | RI | BSL basis | Need for BSL uncertainty analysis | 4.3 |
| 65 | RI | Additional data | Desire for more data at Starr Rock | 4.10 |
| 66 | FS | Wind & wave erosion | Potential for wave disturbance at Starr Rock | 5.3 |
| 67 | FS | Cap monitoring | Scope & type of monitoring | 5.10 |
| 68 | RI | Additional data | Desire for more data in Inner Waterway | 4.10 |
| 69 | RI | Seafood quality | Presentation of RESources crab tissue data | 4.4 |
| 70 | FS | Log Pond concerns | Concerns over Log Pond cap performance | 5.14 |
| 71 | FS | Wind & wave erosion | Potential for cap disturbance during storms | 5.3 |
| 72 | FS | Seismic disturbance | Potential cap disturbance during earthquakes | 5.7 |
| 73 | FS | Cap design | Desire for cap case study document | 5.8 |
| 74 | FS | Cap design | Cap design assumptions | 5.8 |
| 75 | FS | Cap design | Discussion of reactive caps | 5.8 |
| 76 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 77 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 78 | FS | Cap design | Discussion of cap case studies | 5.8 |
| 79 | FS | Cap design | Concerns about capping near pilings | 5.8 |
| 80 | FS | Recontamination & water quality | Sheet piling to control dredging disturbances | 5.16 |
| 81 | FS | Cap design | Concerns about capping on steep slopes | 5.8 |
| 82 | FS | Cap monitoring | Scope & type of monitoring | 5.10 |
| 83 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 84 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 85 | FS | Cap monitoring | Monitoring time-frame | 5.10 |
| 86 | FS | Cap monitoring | Monitoring time-frame | 5.10 |
| 87 | FS | Cap monitoring | Specifics of cap monitoring plan | 5.10 |
| 88 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 89 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-1 |
| 90 | FS/EIS | Alternative ASB uses | Favors ASB removal & habitat restoration | 5.22 & 6.9 |
| 91 | FS | Recontamination & water quality | Sheet piling to control dredging disturbances | 5.16 |
| 92 | FS | Additional data | Desires more data at head of Waterway | 4.10 |
| 93 | FS | Cap design | Capping around pilings & steep slopes | 5.8 |

**Notes:**

EIS Supplemental Environmental Impact Statement
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RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Wendy Steffensen [mailto:waters@re-sources.org]
Sent: Monday, December 18, 2006 3:48 PM
To: McInerney, Lucy (ECY); Sullivan, Shannon (ECY); Hogan, Mike
Subject: Whatcom Waterway comments

Hello Lucy,

Attached you will find comments from RE Sources and Environment International, as well as data from a recent crab sampling effort undertaken by the North Sound Baykeeper.

Thank you for all of your hard work on this project. I look forward to the incorporation of our comments.

Sincerely,

Wendy Steffensen
North Sound Baykeeper
RE Sources for Sustainable Communities

1

**The following is the RE Sources' North Sound Baykeeper position:**

- A full dredge removal of mercury in the Whatcom Waterway, ASB/ lagoon, and adjacent 2
  areas, wherever it occurs above the Minimum Cleanup Level (0.59 parts per million),
  until the contamination is fully removed.
- Disposal of mercury-contaminated sediments to a certified and protective upland landfill, designed and sited specifically for waste disposal.
- Return of the ASB/ lagoon to aquatic habitat to function as land that once existed as part 1
  of the larger Whatcom Creek Estuary.

**The North Sound Baykeeper recognizes that there are areas where mercury removal is more important to the health of the environment than other areas. Mercury removal is most highly recommended in the following places:**

- Inner Whatcom Waterway and Log Pond: Here levels of mercury are as much as 20
  (Inner Waterway) to 254 (Log Pond) times the clean up level. Additionally these two 2
  areas can be fairly easily contained using barrier methods in a cleanup action.
- ASB/ lagoon: Here the levels of mercury are 34 times the cleanup level. At present the ASB and its contaminants are contained. Removing the contaminants from the ASB and opening it up as aquatic habitat will restore valuable lost habitat.
- The SW outside corner of the ASB/ lagoon because it is contaminated and erosional.

**Additional sampling and mercury removal is also a very high priority at:** 3

- Head of the Whatcom Waterway: Here there is little data to characterize the
  contamination present; this area is crucial to habitat restoration and must be cleaned up. #4-B
- Starr Rock: Here the levels of mercury are above the cleanup level, but characterization
  data are not readily available. Starr Rock has a very uneven topography and is relatively 4
  shallow; thus mercury at Starr Rock is vulnerable to disturbance and dispersal.

4

The arguments for the North Sound Baykeeper position are as follows:

I. The RI/FS does not adequately address the pros and cons associated with capping and dredging.

II. The RI/FS "disproportionate cost analysis" is skewed and subjective: It rates removal and capping of contaminated sediments in the Whatcom Waterway as equally protective, it rates the removal of sediments from the ASB as being more protective than removal of sediments from the Inner Whatcom Waterway, and it holds that only options 5 and 6 meet with public concern. 5

III. The use of the override of chemical tests by bioassay tests underestimates potential toxicity and risk. 6

IV. The Bioaccumulation Screening Level (BSL) developed for Bellingham Bay is not protective because it does not account for subsistence fisher consumption levels and it is based on a poor statistical relationship. #5-A

An additional short section (V) Remaining data needs is also included.

Under separate cover, a letter from Environment International, on behalf of the North Sound Baykeeper and Public Participation Panel, addresses some of the shortcomings of this RI/FS related to the issues of capping and dredging.

Detailed comments follow. These have been researched, written, and reviewed by the North Sound Baykeeper, Wendy Steffensen, and her Public Participation Panel, which includes, but is not limited to the following members:

Dr. Clint Duncan, Emeritus Chemistry Professor
Elizabeth Kilanowski, Citizen
Mike MacKay, Fisheries Biologist
Dr. Charlie Maliszewski, Microbiologist, retired
Bill McCourt, Environmental Scientist, and Past Superintendent for Water and Wastewater at the City of Bellingham
Dr. Tom Pratum, North Cascades Audubon, Chemist
Bert Rubash, Citizen
Wendy Steffensen, North Sound Baykeeper, Toxicologist and water quality scientist

I **The RI/FS does not adequately address the pros and cons associated with capping and dredging. Further, it has not offered a convincing argument that the erosion seen at the Log Pond will not reoccur or be seen elsewhere.**

A The preferred alternative relies on a strategy whereby the removal of mercury contamination would occur in areas that are currently the least problematic; i.e., in GP's treatment lagoon which is currently enclosed and in the Outer Whatcom Waterway where contamination is generally light. Mercury levels in the Inner Whatcom Waterway will be as much as 20 times the clean up level, and those in the Log Pond will be as much as 254 times the clean up level. High concentrations of mercury (up to 12 parts per million) are most vulnerable to disruption in the Inner Whatcom Waterway, and so removal of mercury in this area should be prioritized, but it was not. The reason given for this is that the mercury in these areas will be adequately contained; however, very little supporting information is given to support this contention. In previous responses to concerns such as these, the Department of Ecology has stated that such detailed analysis will be presented in the cleanup action plan. By the time the cleanup action plan is developed, the choices that have been made are fairly entrenched and difficult to change. I would put forth that dredging and removal of high levels of mercury should be the preferred solution. There may be particulars that contraindicate dredging in some areas, but these have not been elucidated in the RI/FS. The decisions of where to cap and dredge should be tabled until a more thorough analysis is done.

1 According to the RI/FS cap depth will be between 3 and 6 feet. Three feet is much too 3
shallow, for any cap in the Whatcom Waterway area.

a Capping depths, are based in part, on the assumption that the biologic zone only extends 12 cm. However, as stated on pages 6-8 and 6-12, "Sedimentation studies were completed as part of the 1996 investigation activities, as summarized in the 2000 RI/FS. Based on the Pb-210 profiles the base of the mixed-layer was estimated to range between 24 cm (core HC-NR-100) and 11 cm (core HC-NR-
102)." Since the mixing zone extends to 24 cm, the biologic zone should be 4
considered 24 cm, instead of 12 cm, to be conservative and protective. In fact, the cap thickness required to account for both surface and mid-depth bioturbation extends at least 20cm, to as much as 60 cm, depending on the cap material and the organisms present. (Clarke, D.G., Palermo, M. R., and Sturgis, T.C. (2001), Subaqueous cap design: Selection of bioturbation profiles, depths, and rates, "DOER Technical Notes Collection (ERDC TN-DOER-c21), U.S. Army Engineer Research and Development Center, Vicksburg, MS, www.wes.army.mil/el/gots/doer)

b On page 6-18 (Vol 1), it is stated that "For purposes of evaluating potential sediment disturbances through bioturbation, both sediment penetration by sediment dwelling invertebrates and potential periodic disturbances by feeding whales can result in disturbance of the upper 30-40 cm, and as deep as 90-120 cm of the sediment column in subtidal areas. These depths are similar to the depths potentially disturbed by anchor drag and navigation disturbances." In light of this
information, the disturbance layer for the cap should be between 90 -120 cm, or 3- 2
4 feet.

c Any cap should include several layers in order to effectively isolate the contaminant. These should be an erosional layer, a disturbance layer and an isolation layer. As discussed above in (1) and (2), the disturbance layer can arguably be anywhere from two to four feet. The entire cap depth, however, must also include a layer that can erode and a layer which isolates contaminant from the layers where disturbance occurs. Given this information, a six foot cap seems 1
to be the bare minimum of what might be acceptable. Thicker caps, where caps are needed and indicated as the best solution, should be used.

d The needed thickness of the erosional layer for the cap is not readily apparent. What is apparent however, is that the area proposed for capping in the Inner 13
Whatcom Waterway is erosional. Please address the utility of capping in an erosional zone, with information on the thickness for the erosional layer and as well as required monitoring and maintenance. Evidence of the erosion is the increasing mercury concentrations in the Inner Whatcom Waterway and vicinity (see III, C, 4 and 5)

2 The RI/FS has not addressed seismic or weather related events, such as storm surge, 14
in great enough detail. Without further information an informed decision on the choices for the Whatcom Waterway (capping, dredging or natural recovery) cannot be 15
proposed. Liquefaction and sand volcanoes associated with seismic events can resuspend contaminants underlying a sediment cap. If dredging is not the cleanup method of choice, a thorough seismic and storm surge assessment should be completed as soon as possible.

a The first two paragraphs of Section 6.3.4 of Volume One should be better referenced than a direction to a USGS website, which leads to an earthquake prediction model based on faults located in the Seattle area. In addition the USGS says, that their model is, "not necessarily the best model for such determinations. However, it is the model that is used for many seismic-hazard assessments and it can be used as a benchmark for comparisons with other more sophisticated earthquake-generation models."

b There may be unidentified faults in the Bellingham area and, faults that are known have been little studied. The model used by the USGS is based on faults located in the Seattle area, not on faults located in Northern Puget Sound.

c Storm surge is addressed briefly in the EIS in Section 3.2. The sentence, "Flooding, storm surge, and tsunamis (in decreasing order of probability of occurrence) may increase the water levels in Bellingham Bay on rare occasions" is misleading. What constitutes rare? Does rare mean one storm a year, a decade, or every 50 years. Anecdotal evidence indicates one or two serious storms in this area each year; for example the February 4, 2006 storm and the November 15, 2006 storm, both of which had significant storm surge associated with them.

3 The RI/FS did not adequately evaluate the difficulty of capping around pilings and on 16
steep edges, even though failure of the log pond cap stemmed from inadequate capping around its edges and pilings. According to the consultants at Environment International, the Army Corps of Engineers guidelines provides the "gold standard" for cap construction, although caps constructed under these guidelines are not infallible. As well, caps do not function well around structures and at steep edges. This is why dredging is preferred in waterways and rivers. Erosion at the Log Pond, a

place surrounded by structures and edges, occurred, in part, because Army Corps of 17
Engineers guidelines were not followed to the letter, because the pilings and
structures at and surrounding the Log Pond made following the guidelines difficult. It
is not acceptable for mercury cleanup to only be done halfway, at the Log Pond or in
the Waterway. **If capping is selected as a final solution, what remedy is proposed
at the steep edges to prevent erosion and sloughing of mercury contaminated** 18
**sediment from entering the water? The final solution for mercury cleanup must
be as permanent as possible, and capping does not provide permanence,
especially at the interfaces around structures and edges.**

4 In the discussion of capping and dredging and the opening up of the ASB, it has been
proposed to dredge the ASB for its use as a marina, dredge the Outer Whatcom
Waterway for navigation, but not to dredge the Inner Whatcom Waterway or Log
Pond. Both the Inner Waterway and Log Pond are subject to tidal and wave action;
additionally, the Inner Waterway is subject to fast boat traffic. The development of a 19
marina will affect the current and wave action at the Inner Waterway and Log Pond,
and will increase the frequency of boat traffic. How this will be accounted for is not
mentioned in the RI/FS. The decision to cap at the Inner Waterway and Log Pond,
knowing that the marina will increase the current and wave regime, cannot be
supported. Please provide an analysis of how the marina and its traffic will affect the
currents and waves. As well, please delineate what measures would be needed to
stabilize a cap under this more turbulent scenario.

B Several areas in the cleanup area are not slated to be capped or dredged. For the areas
offshore of ASB, near the BST, and at Starr Rock, in alternatives 1-7, there will be
limited capping in two small areas that exceed SQS standards. The surface sediment in
the rest of these areas contains mercury between 0.59 and 1.2 ppm and the subsurface
of the area offshore of the ASB and near the BST contains mercury between 1.2 and 5 20
ppm (and the subsurface contamination at Starr Rock is not given). It has been stated
that natural recovery will not be used to meet compliance with standards and that
subsurface contamination may contribute to contamination at the surface levels. Since
this is the case, please provide some alternative other than monitored natural recovery
to remediate these areas.

C The Log Pond cap has not successfully demonstrated that capping is an acceptable
option elsewhere in the waterfront area. The Log Pond cap has not met all the
performance objectives (page 2-4 Vol. 1). It appears that the cap is being contaminated
with mercury. Mercury concentrations are increasing in surface sediments at four of
six sediment surface sample sites (Vol.1 Appendix I, Table 4-2, sites SS-301, SS-40,
SS-76, and SS-WP-1). Volume 1 of the draft RI/FS offers an explanation of the
increase in mercury that is incomplete. The draft RI does not substantially address the
potential for contamination of the cap through ground water transport of mercury to the 21
surface sediments where it may be sequestered and accumulate. Surface sediments can
be conducive to the accumulation of mercury. Additional data are needed to show that
mercury contamination of the cap due to ground water is not occurring. Continued
increases in surface sediment mercury levels will increase the risk for biomagnification.

1. The explanation provided in Volume 1 of the RI/FS does not explain the increases at sites away from the SW corner of the Log Pond and years of monitoring will be required to determine if mitigations proposed (Appendix D, Vol. 2) are successful, which assumes that there are not other mechanisms responsible for the accumulation of mercury in the surface sediments of the Log Pond cap. See below for an alternative explanation.
   a. The limited migration of sediments shown in Figure 4-2 of Appendix I (Vol. 1) is 22
   distant from sample sites SS-301, SS-40, and SS-76.
   b. The supplemental sampling locations (Appendix I Vol.2) are one-time samples and are concentrated along the shoreline and the southwest corner on the Log Pond. This skewed distribution does not allow for evaluation of the other areas of increases in mercury concentrations.
   c. Additional time is required to monitor the situation at the cap. If limited migration of sediments are not the sole cause of mercury increases (which they do not appear to be), and/or mitigations do not work, sediment mercury concentrations will likely exceed the SMS criteria based upon the increases observed between 2001 and 2005.
   d. The statement on page 4-5 of Appendix I (Vol.1) that "The current distribution of mercury exceedances is very limited in extent" is misleading. Sample site SS-301 equals the SQS criterion value, and Sample Site SS-76 exceeds the SQS criterion and is just below the CSL criterion. In addition, two samples were taken at Sample Site SS-76, one of which did exceed the CSL criterion. These sites span nearly the entire Log Pond. Further, sediment mercury concentrations are increasing at these sites (and SS-40), indicating that future exceedances are likely, and that exceedances will be widespread.
2. Contamination of the surface sediments of the Log Pond cap through ground water transport of mercury is another mechanism that the RI/FS does not adequately address. This mechanism needs to be evaluated further if capping is to be used elsewhere in the vicinity.
   a. The 2001 Engineering Design Report for the Log Pond Interim Remedial Action 23
   (2001 Analysis)(Anchor, 2001a in Vol.1 on page 3-10) that indicated ground water discharging to the Log Pond is unlikely to cause sediment recontamination pre-dates the monitoring showing that surface sediment concentrations are increasing. The evidence collected to date indicates that the 2001 analysis could be wrong. Further investigation is needed to determine the source of the contamination of the Log Pond cap.
3. Mercury fate and transport is complex and difficult to predict. It is not surprising that the prediction in the 2001 Analysis (Anchor, 2001a) is likely wrong. For complex situations such as this, empirical information trumps predictions, meaning that the presence of mercury in the surface sediments cannot be discounted by a prediction stating that it is unlikely that mercury will be in the sediments.
4. Page 6-14 of Volume 1 also indicates that ground water transport (e.g., advection, diffusion) of mercury is not significant, based on studies that pre-date the monitoring of the Log Pond cap. The discussion does not go so far as to say that ground water transport does not occur, only that it is not as important as other processes or that it is not significant. The monitoring performed by Bothner et al. (1980) only measured

ground water flow at two locations, too few to summarily characterize the entire area. Again, empirical information from the Log Pond cap indicates that ground water transport is a likely mechanism for contamination of the cap.

5 Page 2-3 of the draft FS contains the statement, "Sediment monitoring since that time
*[2000 and 2001]* has demonstrated that the cap is performing well, and is successfully 24
preventing underlying contaminants from migrating upward through the cap" (information in brackets added). This statement is not supported by the facts. Concentrations of mercury are increasing in the surface sediments of the cap, and only a partial and inadequately tested explanation has been provided. This statement also contradicts the statement in the draft RI that the Log Pond cap has not successfully met all of its performance objectives.

- a Monitoring of pore-water mercury in the cap only means that mercury is present in the pore-water. The pore-water is moving towards marine waters and may
represent a constant (i.e., ongoing) source of mercury that can accumulate in the 25
surface sediments.
- b Both the RI and a previous study (Aspect, 2004. *Draft Feasibility Study Former GP Chlor/Alkali Facility, Bellingham, Washington.* Prepared for Georgia-Pacific, Inc. Agency Review Draft. July 19, 2004) indicate that ground water from the adjacent uplands discharges to marine waters through the Log Pond cap. This provides a mechanism for mercury contamination of the cap.
- c Page 3-10 of Vol.1 states for the Chlor-Alkali Plant area, ground water gradients are generally offshore towards the Whatcom Waterway.
- d Page 2-3 of Vol. 2 states, "Monitoring of groundwater discharges in the cap area has demonstrated no ongoing impacts to surface water or cap conditions from the adjacent chlor-alkali plant upland areas." This statement indicates that there is ground water discharge through the cap. However, the rest of the statement is problematic, not the least of which is that ground water mercury concentrations do not give a complete picture of cap conditions, that is, ground water concentrations do not address accumulation of mercury derived from ground water in the surface sediments of the cap. Further, it does not address the potential source of mercury in the contaminated sediments buried immediately below the cap.
- e Page 3-2 of Appendix I (Vol. 1) states for ground water in the Log Pond Cap, "The results of the Year 5 water quality monitoring data indicate compliance of seepage discharges with state surface water quality standards and verify cap integrity with limited mobility of mercury within the cap." This statement acknowledges ground water discharge from the cap and mobility of mercury within the cap. Accumulation in the surface sediments of mercury from ground water would lower the concentration of mercury where ground waters discharge to surface waters.
- f Pore water mercury concentrations are likely variable over time, as indicated by the results in Table 3-1 of Appendix I (Vol.1). Year 5 mercury results are generally low, but also occurred when temperatures were the greatest, the redox potential was the lowest, and turbidity was the lowest. The changes in temperature, redox, and turbidity may be responsible for the relatively low Year 5 pore water mercury concentrations.

g The source of the pore-water mercury may be the contaminated sediments immediately below the cap, and/or upland areas of elevated mercury associated with the former chlor-alkali plant.

(i) Conditions at the surface sediments appear to be such that mercury is retained and accumulates in the surface sediments. There are considerable changes in the physical, chemical, and biological environments in the surface sediments as compared to conditions farther away from the sediment-water interface. #7-B

(ii) The presence of iron and organic materials in the surface sediments makes it more likely mercury present in the ground water will end up in the solid sediment phase. This would result in, and could explain, the accumulation of mercury in the surface sediments.

(iii) While the specific forms of mercury present in the pore water and sediments are not known (they have not been quantified in the RI/FS), it is known that mercury is accumulating in the surface sediments. This accumulation of mercury is the best information available to address mercury fate and transport. It represents what IS happening in the real world. Just because the specific mechanisms are not known (and largely have not been examined) does not mean that mercury is not accumulating in the sediments.

D The interim solution of capping at the Log Pond has not been addressed as to whether it is the correct final solution at the Log Pond. All alternatives give the final solution at the Log Pond as capping and remediation of the existing cap without any discussion of whether this is the best final solution. **Dredging of the log pond may be a viable solution to the mercury contamination that is present and it should be discussed.** According to Environment International, sheet pile walls or other containment devices could be placed to contain the Log Pond (as well as the Inner Whatcom Waterway) and to dredge it with minimal mercury re-exposure. This possibility has not been addressed and should be. In light of the erosion of the Log Pond, I am not confident that the cap at the Log Pond will remain in place in perpetuity. It would be better to fix the problem of mercury contamination now at the Log Pond, where mercury concentrations are 254x the clean up standard, rather than allow the cap to erode mercury over time. Monitoring and maintenance regimes needed to address the full potential mercury loading from the Log Pond would be very onerous if they were done with the thoroughness and regularity needed to prevent mercury from seeping into the environment. Additionally, there are no assurances over time, that the monitoring and maintenance would be done. 26 27

**II The RI/FS "disproportionate cost analysis" is skewed and subjective: It rates removal and capping of contaminated sediments in the Whatcom Waterway as equally protective, it rates the removal of sediments from the ASB as being more protective than removal of sediments from the Inner Whatcom Waterway, and it holds that only options 5 and 6 meet with public concern.** 28

A The cost benefit analysis of removing mercury as presented in the RI/FS is in error because it rates the removal or capping of contaminated sediments in the Whatcom Waterway as equally protective and it rates the removal of sediments from the ASB as being more protective than removal of sediments from the Inner Whatcom Waterway.

Capping cannot be equally protective as dredging because dredging solutions remove the sediments, whereas capping solutions do not. At present, the Whatcom Waterway and Log Pond are most at risk to re-expose mercury. The proposed plan to open the ASB does not change that. 29

B The RI/FS evaluated 8 limited alternatives and did not evaluate two key options for removing contamination and restoring habitat, such as i) a full dredge of the Whatcom Waterway coupled with non-industrial use, and ii) full dredge of the lagoon coupled with its complete return to habitat. 30 These alternatives should be considered, as they reflect the desires of a large portion of the community.

C The RI/FS did not adequately evaluate dredging techniques in the Inner Whatcom Waterway that would minimize short term risk, such as the placement of sheet pile 31 walls to contain any sediment disturbed by dredging. Part of the reason the disproportionate cost analysis showed that Alternatives 7 and 8 were not competitive alternatives is that not only was short term risk management weighted equally to long term protectiveness and permanence, but no management of the short term risk was evaluated.

D In addition, the more that the cleanup relies on capping, the more it will rely on "institutional controls" which have not been defined and which are sometimes very difficult to regulate, such as a speed limit or restricted area, for boaters. The institutional controls that will be needed should be outlined and their implementability 32 should be evaluated. Clean ups requiring more institutional controls should be acknowledged to be less protective than ones requiring less.

E The numbers used to back up the disproportionate cost analysis, illustrated in Figure 7-1, in Volume 2 are misleading.

1. The cumulative enrichment ratio treats mercury and other PBTs in the same manner 33 as it does other contaminants. For a full picture of the toxicity in the Whatcom Waterway site, the cumulative enrichment ratio study should be presented under different scenarios; such as PBT only, all chemicals, and a blend where the enrichment ratio of PBT chemicals is rated higher than non-PBT chemicals.
2. The use of "Relative Concentration of Remaining Contained Subsurface Sediments" as a measure of efficacy and protectiveness also appears misleading. If contaminated sediments are stored in the ASB they would no longer be in an open environment, whereas sediments that are merely capped in the Log Pond and Inner Waterway would be. The concentration of remaining contained subsurface sediments should apply only to those sediments where re-exposure is a risk. Thus, the concentration of remaining contained subsurface sediments would be much lower under Alternatives 3 and 4, than illustrated. (This is not to say that the ASB shouldn't be dredged, just that the arguments used to enable its dredging are incorrect. Moreover, additional areas should be dredged that are not being considered for dredging.)

F The costing of each of the alternatives is too general to be used as a decision making factor. Specifically, the type of monitoring or potential maintenance regime needed for 30

each of the alternatives is not given, the time periods over which the monitoring would
occur are not given, and there is no cost estimate for maintenance nor is there any detail
provided for the cost of monitoring (estimated at $640,000 or $1,040,000 depending on
the alternative). The cost of monitoring will be different for each of the alternatives
because each alternative is different and reflects a different mix of capping and
dredging. According to Environment International, cap monitoring costs typically far
exceed post-dredge monitoring costs when dredging has effectively removed the risk
caused by contamination. Remaining sediments should be tested during dredging and
additional dredge passes should be made until the mercury is below levels of concern.
Thus, the more areas dredged, the less the monitoring cost should be. Maintenance
monies need to be set aside for caps, as evidenced by the erosion at the Log Pond. 31
According to Environment, annual maintenance costs should be reserved and factored
into the final costs over the expected lifetime of the cap. In Q & A sessions, the
Department of Ecology has brushed off concerns regarding the cost of each of the
alternatives and the lack of detail for maintenance and monitoring, stating that a 30%
cost overrun has been added to each. Because cost is a major decision factor, this
explanation is not adequate. According to Environment International, dredging
typically costs more initially, but the complete cost of capping versus dredging is
normally fairly equivalent because of the cost needed to maintain and monitor cap
projects.

G The rating of public opinion centers primarily on the land use objectives put forth by
the Port, visioned by the Waterfront Futures Group, and supported by the City. The
land use plan put forth by these entities did not include any discussion of what should 32
be done with the mercury contamination. During some of the initial hearings on
whether the Port should acquire the land, and whether a marina should be developed in
the ASB, one common concern was whether that would drive or preclude cleanup
options. The public was assured this was not the case. Yet, the public concern ranking
uses "land use", without any consideration of how the public feels about the presence of
a bioaccumulative toxin in the nearshore. Land use is affecting cleanup options. Much
of the public feels strongly about removal of contamination from Bellingham Bay. This
is reflected in the comments made at hearings, in response to this cleanup plan, as well
as in response to previous cleanup plans. One common refrain I hear again and again is
that, "Mercury is forever—We want it out of our Bay—We must be responsible
stewards to future generations." I also hear discussions from citizens who so much want
a better cleanup, they are brainstorming ways to clean it up themselves, through levies 33
and taxes! Clearly, public sentiment is running high to clean up the mercury.

H The cost-benefit analysis should be re-run to reflect the needed changes.

1 Areas where there is more dredging in non-contained areas and less use of institutional controls should be rated more protective and should be rated higher for long-term effectiveness.

2 The Log Pond and the Inner Whatcom Waterway are presently the most exposed areas; acknowledgement of that fact should be included in the risk analysis.

3 The ability to manage short-term risk should also be acknowledged, and the scoring 34
of short term risks should not be equivalent to long-term effectiveness or protection.

4 The public concern rating should be revised to include public concerns about leaving mercury in the environment, not just land use concerns.

**III The use of the override of chemical tests by bioassay tests results in an underestimate of potential toxicity and risk.**

A Mercury is a persistent bioaccumulative toxin. Bioassays only test specific responses in specific invertebrates, rather than the endpoint of concern, neurological development in developing babies and the young. For this sensitive endpoint, a new test must be developed or more rigorous testing of animals at various and higher trophic levels must be used. Caged fish or crab studies in the area of concern might be appropriate here. In the absence of such a test, one should default to the use of the maximum clean up level (0.59 ppm) or sediment quality standard (0.41 ppm) in order to be protective of biota. 35

B In the Whatcom Waterway, bioassay test results did not correlate well with chemistry test results. It has been said that there is something about Bellingham Bay sediments that protects against mercury bioavailability or toxicity. However, the identity of the condition or substance that confers this protection is unknown. Without knowing why mercury concentrations in Bellingham Bay do not confer toxicity in bioassay tests, whereas those same concentrations exhibit toxicity in other locations, we cannot know whether this condition will change or be affected by other changes, such as sea level rise, temperature increase, increased organic input, change in redox levels, etc. In the absence of this knowledge, it is not protective to assume that mercury will always be similarly sequestered and unavailable. 36

C Testing of samples in the Whatcom Waterway is not complete because of the sampling regimen used, whereby samples were chemically tested, subsequently tested via bioassay, and not tested again if they passed the bioassay. It has been noted that chemical and biological tests did not correlate well, and the reason for this is not clear. #12-K To be protective, samples should be tested for toxicity using both biological and chemical means. A failure in either category, should signal that the sample and the area is contaminated and needs to be remediated. Additionally, samples that pass chemical or biological tests are no longer sampled in subsequent years, but some of these sites are erosional and have the potential to increase in toxicity. For example, note the following samples:

1 Sample 21, located offshore of the Bellingham Shipping Terminal tested at 1.2, the BSL, passed a bioassay and was never retested. It seems a little disingenuous to allow a test at the BSL to be a pass. This site should be cleaned up.
2 Sample 79 tested above the BSL, failed bioassays and was never retested: it is not clear whether this site has been cleaned up via the Log Pond cap. If not, this site clearly needs to be remediated.
3 Sample 87, in the Outer Whatcom Waterway, tested above the MCL, but did not have bioassays conducted on it and was not retested. This site should be targeted for clean up, if not already located within the dredge prism.
4 Samples 33, 36, 37, and 77 in the Inner Whatcom Waterway and Sample 71 located in the Outer Whatcom Waterway had mercury concentrations which increased from

one sampling event to another, to as high as the BSL, but were not retested because of a bioassay pass. Since mercury concentrations are increasing in these areas, they are 37
likely erosional and should continue to be tested as they will likely increase above the BSL and/or fail a bioassay.

5 Samples 13, offshore of ASB, 70 and 72, in the Outer Waterway, and 73 and 78 in the Inner Waterway had mercury concentrations above the MCL which decreased very little from one sampling event to another, demonstrating that natural deposition was not happening in these areas to any useful extent.

D The RI/FS notes that "bioaccumulation testing" has been done to show that little bioaccumulation is occurring (section 4, Volume 1). This information is misleading, and should be removed from the text. The bioaccumulation test that was done was a preliminary test (Appendix H, Figs. L8-L10), used as a screen for PSDDA disposal, and 38
was performed to determine bioaccumulation potential in those Whatcom Waterway sediments slated to be either dredged or capped. In addition, very few organisms were tested, these were at the low end of the food chain (polychaete and clam) and the surface sediments from this sample were relatively clean. In order to determine bioaccumulation potential additional more rigorous tests would need to be conducted

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E The depth at which samples are chemically and biologically tested should be changed to reflect the actual biologic zone of 24 cm. (see item # I, A, 1, a above)

**IV The Bioaccumulation Screening Level developed for Bellingham Bay is not protective because it does not use subsistence fisher consumption levels and it is based on a poor statistical relationship.** #12-L

A Mercury is a persistent bioaccumulative toxin. It does not degrade over time and it can be taken up by marine animals and be passed up the food chain. Low levels of mercury can induce neurological abnormalities in fish, birds, orcas, and humans. Mercury toxicity is a concern in the U.S. One recent study found that "approximately 8% of women had concentrations higher than the US EPA's recommended reference dose (5.8 40
ug/L) below which exposures are considered to be without adverse effects" (Shober et al, JAMA, April 2, 2003) A second study estimated that between 316,588 and 637,233 children have a loss of intelligence that causes "diminished economic productivity that persists over the entire lifetime of these children," and that, "This lost productivity is the major cost of methyl mercury toxicity and it amounts to $8.7 billion annually." (Trasande, et al, Env. Health Perspec., May 2005)

B Published mercury levels in fish and Dungeness crabs in Bellingham Bay and the Whatcom Waterway are higher than background and can pose a risk to humans who eat them. Published data show that the mercury concentration in crab tissue ranges from 0.100 to 0.211 mg/kg (ppm) in the Whatcom Waterway -1991 and 1997 collections, as 42
shown in RI/FS. According to EPA, only 8 meals per month (8 ounces per meal or 227 grams/ meal) should be eaten if the mercury concentration is between 0.078 and 0.12 ppm wet weight, and only 4 meals per month should be eaten if the mercury concentration is between 0.12 and 0.23 ppm. (EPA 823-B-00-008; Guidance for

Assessing chemical; contaminant data for use in fish advisories, Volume 2; Risk
assessment and fish consumption limits). Subsistence fishers are estimated to eat 173 g
/ day /70 kg. If subsistence fishers ate crab containing between 0.078 and 0.12 ppm at
this rate, they would be eating 2.7x more mercury than is considered safe; for crab
containing between 0.12 and 0.23 ppm, they would be eating 5.4x more mercury than is
considered safe. Recent sampling of crabs in the Whatcom Waterway show slightly 43
lower levels of mercury than the previously published studies, although the numbers
still appear to be elevated. Verification of any decrease in mercury levels in crab is
necessary with a much larger number of samples in order to achieve statistical
significance. (See attachment 1 for crab sample results)

C The calculation used to obtain the BSL was a multi-step process which, when viewed
step by step makes some sense, but when looked at as a whole, is inadequate. The need
for a BSL is evident due to the persistent and bioaccumulative nature of mercury. What
is not evident, however, is what value the BSL should be in order to protect humans 44
and wildlife. The BSL has numerous shortcomings, elucidated below, that undermine
its use as a protective standard. Because of the shortcomings in the derivation of the
BSL, its value of 1.2 mg/kg sediment should be replaced with 0.59 mg/kg sediment, a
value equivalent to the MCL, a number for which there is some scientific justification.

D The concept underlying the derivation of the BSL, that mercury concentrations in tissue
are proportional to the amount of mercury in sediment, has proved to be a vast
oversimplification. Researchers have found that accumulation of methylmercury into
tissues cannot be accurately predicted based on the level of mercury in sediments.
(Lawrence, A.L., and R.P. Mason. Factors controlling the bioaccumulation of mercury 45
and methylmercury by the estuarine amphipod Leptocheirus plumulosus,
Environmental Pollution: 11: 217-231, 2001). The fact that this correlation is an
oversimplification is demonstrated by the calculated r2 (regression coefficient) of 0.04
for bottomfish, 0.73 or 0.45, for Dungeness crab and 0.17 for clams and mussels. (Note
that the latter regression coefficient for crab is calculated based on the full complement
of Dungeness crab samples as calculated by the Public Participation Panel)

E Regressions for each category- bottomfish, clams/mussels, and crab, were calculated,
each with a low $r^2$ value. In fact the regression and $^{r2}$ for bottomfish was so low that it
was not statistically significant from zero and could not be used. The slope and $r^2$ for 46
the clams/mussels and crab regressions were significant but were very disparate. It
appears that the clams/mussel and crab regressions were merged: Please clarify. These
regressions should not be merged, as the resulting regression for the combined data
would be meaningless.

F The BSL derived from the regression is based on the premise or "prediction" that fish/
seafood containing approximately 0.18 mg/kg wet weight of mercury would be found 47
in areas containing 1.2 mg/kg dry weight of mercury. Yet, Dungeness crabs having
greater than 0.18 mg/kg mercury in their tissue (0.204, and 0.211 mg/Kg) were found in
sediment containing only 0.54 mg/kg mercury. On the other hand, clams (from Eagle
Harbor) in sediments containing more than 1.2 mg/ kg mercury, 1.30, 2.85, and 12.44,

had 0.159, 0.091, and 0.091 mg/Kg mercury, respectively. Clearly, the regressions from which the BSL were calculated have very little relation to what is actually happening in Bellingham Bay.

G Another concern regarding the derivation of the BSL and the crab regression is that the
data set used to predict the regression line employed crabs with "averaged" tissue levels 48
from 0.046 to 0.155 mg/kg wet weight, corresponding to sediment levels from 0.10 to
0.91 mg/kg dry weight, whereas the BSL is calculated to be 1.2 mg/kg of mercury in
sediment, outside of the crab data set. Thus, the BSL essentially predicts "beyond the
data set". Whether this is warranted or not is unclear; supporting information to verify
whether the regression line that extends beyond the data set would be defined by the
same line is not included. If uptake of mercury is biphasic, the regression lines defining
the relationship between sediment and tissue mercury concentrations can be different
from one another.

H The dataset used to derive the BSL should consist of seafood and fish from the
Whatcom Waterway area, since uptake of mercury from the sediment is location - 49
dependent. (Lawrence, A.L., and R.P. Mason. 2001. Factors controlling the
bioaccumulation of mercury and methylmercury by the estuarine amphipod
<u>Leptocheirus plumulosus,</u> Environmental Pollution: 11: 217-231, and Luoma, S. N. et
al. 2005. Why is Metal bioaccumulation so variable? Biodynamics as a unifying
concept. Env. Sci. Tech 39:1921-1931) The data set of Dungeness crab used to derive
the BSL contained 23 samples from around Bellingham Bay, only 8 of which were
from the Whatcom Waterway. The hardshell clam and mussel data contained 38
samples, with the vast majority (34) outside of Bellingham Bay, and none from the
Whatcom Waterway. In light of this information, it is likely that the regression for
hardshell clam and mussel is meaningless for Bellingham Bay.

I The crab tissue data, which has the most statistically significant relationship between
tissue and sediment and which has the greatest number of specimens taken from
Bellingham Bay should be used to derive the BSL value, should this methodology be
retained for the calculation of the BSL. Using the crab data, the calculated BSL would 50
be 0.88 mg/kg sediment. This value is obtained by running the regression, just as the
consultants at Anchor did, in the July 2000 RI/FS, with one significant deviation.
Individual crab mercury concentrations found within a certain geographic area should
be treated as individual samples, and not averaged before conducting the mathematical
analysis. Averaging the samples serves to mask the variability of the crabs, and to
dilute high mercury tissue values with low mercury values. Averaging before analysis
can only happen if there is a reason to do so; in this case, each of the crabs caught are
individual samples and averaging is not warranted.

J The BSL calculation is in error because it uses a low consumption rate, whereas it
should be using a conservative subsistence consumption rate. The conservative
subsistence consumption rate used by EPA is 173 g / day /70 kg. Similarly, researchers 51
found that the Tulalip, Sqauxin Island, and Suquamish Tribes consumed 161, 133, and
168, g/ day/ 70 kg (Exposure analysis of five fish consuming populations for

overexposure to methylmercury, January 2001, WA Dept of Health). In contrast, the
consumption rate used for the Whatcom Waterway BSL model was 70g seafood/ day/
70 kg person. In the absence of consumption rates from tribal peoples or subsistence
fishers consuming seafood from Bellingham Bay, the conservative value of 173
g/day/70 kg must be used. **In order to justify the use of the lower 70 g number, the
modelers used numbers from a regional study (Toy, et al. 1996. A fish
consumption survey of the Tulalip and Squaxin Island Tribes of the Puget Sound
region. Tulalip Tribes, Department of Environment), citing that the Tulalip and
Squaxin Island Tribes ate approximately 70g/ 70kg/ day of shellfish and
bottomfish. The modelers then assumed that local high-end consumers ate 70 g/** 52
**70kg/ day of shellfish and bottomfish from Bellingham Bay. They did not however
factor in potential mercury loading from other types of seafood, such as salmon,
other pelagic fish, and tuna. This error is a serious underestimate of the potential
risk to high-end consumers. In order to ensure that people are not ingesting too
much mercury from seafood, the entirety of their likely mercury consumption
from seafood consumption must be included, regardless of its source.**

K The regional Toy study used to develop the model cited that 8.3 g of bottomfish and
58.8 grams of shellfish eaten, whereas the BSL, referencing the Toy study, used values
of 7.8, 23.4, and 38.5 g/day respectively for the consumption of bottomfish, crab, and 53
clams and mussels. The Toy study did not break out the amount of mussels, clams, and
crab eaten; it only listed amounts of shellfish. The modelers assumed that 23.4 g of
crab, and 38.5g of clams and mussels were eaten, with no referenced source. Since the
Dungeness crab samples used in the BSL calculation had significantly higher levels of
Hg than other forms of shellfish, a truly "conservative" approach to BSL calculation
would employ only the Dungeness crab regression data to calculate safe consumption 54
for subsistence/tribal fishers consuming 173 grams per day.

L The assumptions used to calculate the BSL are labeled as "conservative", but several of
the assumptions are not conservative. One assumption is that the model used
"Conservative Tribal Fish and Shellfish Consumption Rates" as shown in items (J), the
consumption rate is a vast underestimate. A second assumption labeled as conservative 55
was the assumption that 100% of the mercury in tissue is methylmercury, and an
overestimate of the risk by 10 to 30%. In fact, the vast majority of mercury (> 95 %) in
seafood is methylmercury (Bloom, N.S. 1992. On the chemical form of mercury in
edible fish and invertebrate tissue. Can J. Fish Aquatic Sci V 49: 1010-1017). A third
assumption labeled as conservative is that 100% of the seafood ingested is assumed to
be harvested from the Whatcom Waterway Site. Again, only 70 grams of the total 173 56
grams was assumed to be ingested from the Whatcom Waterway site.

M If one were to try and use the relationship between seafood and sediment in a conservative manner, one would use the regression from the crab data and assume consumption of 173g/ 70 kg/day. Based on this calculation the BSL value would be 0.26 mg/kg.

N The dataset used to model the BSL was a small data set and as such its statistical power is small. The uncertainty associated with using the small data set should be expressed. 57

## V Remaining Data Needs

A Starr Rock: Here the levels of mercury are above the cleanup level, but characterization 58
data are not readily available. Starr Rock has a very uneven topography and is relatively 59
shallow; thus mercury at Starr Rock is vulnerable to disturbance and dispersal. Please provide subsurface data on Starr Rock and a remediation plan to clean up the subsurface sediments here. If mercury is "contained" at Starr Rock, please provide 60
information on how this will be maintained and monitored.

B Head of the Whatcom Waterway: Here there is little data to characterize the contamination present; this area is crucial to habitat restoration and must be cleaned up. At present, it is slated for monitored natural recovery only. Mercury, phenols, and total #12-M
organic carbon data from the head of the Waterway, should be collected and presented in a comprehensive manner. The head of the Waterway should be a productive place. Since it is not, it is necessary to investigate and correct the cause.

Summary of Total Mercury Analysis of Crab Muscle Tissue
Crabs collected from Whatcom Waterway



| Sample # | Sample Location | Sample Date | HgT conc (µg/gww) | HgT conc (µg/gdw) |
|---|---|---|---|---|
| 1 | SE corner of ASB | 9/22/2006 | 0.0964 | 0.418 |
| 2 | SE corner of ASB | 9/22/2006 | 0.0910 | 0.421 |
| 3 | SE corner of ASB | 9/23/2006 | 0.0842 | 0.407 |
| 4 | SE corner of ASB | 9/23/2006 | 0.0907 | 0.391 |
| 5 | Adj to log pond | 9/30/2006 | 0.0781 | 0.356 |
| 6 | Adj to log pond | 9/30/2006 | 0.0600 | 0.255 |
| 7 | Adj to log pond | 9/30/2006 | 0.0777 | 0.338 |
| DORM2* | na | na | na | 4.74 |
| Detection limit** | na | na | 0.0002 | 0.001 |

Analytical uncertainty (%rsd) = 10.3% based on triplicate analyses on 2 samples, one from each site
*DORM-2 is a certified reference material (NRCC, dogfish muscle); certified concentration = 4.64 ± 0.26 µg/gdw
**Detection limit is based on 3 x the standard deviation of method blanks and an average sample size of 2.74 g wet crab

FILE: Crab_HgT.xls

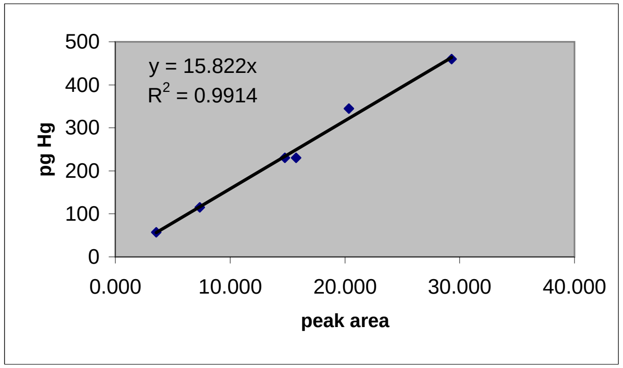
Experiment Crabs

DATE: Digest: 10/12/2006
CVAF: 10/17/2006

BUBBLER BLANKS:

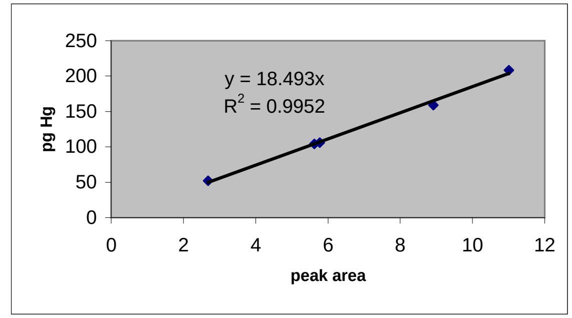
| bubbler | trap | PA | pg Hg |
|---|---|---|---|
| 1 | 3 | 0.5071 | 8.02 |
| 2 | 4 | 0.6483 | 10.26 |
| 3 | 5 | 0.4889 | 7.74 |
| 1 | 6 | 0.4658 | 7.37 |

ave 0.528
std 0.082




Vapor Standard

| vol (uL) | pg/uL | pg Hg0 | PA | pg/PA |
|---|---|---|---|---|
| 5 | 20.84 | 104.2 | 5.62 | 18.5 |
| 10 | 20.84 | 208.4 | 11.01 | 18.9 |
| 2.5 | 20.84 | 52.1 | 2.686 | 19.4 |
| 7.5 | 21.17 | 158.8 | 8.919 | 17.8 |
| 5 | 21.17 | 105.9 | 5.778 | 18.3 |




AQUEOUS STANDARD: **7/25/03 std 1.15 pg/uL**

| bubbler | trap | std ul | PA | PA-bbl | pg Hg | |
|---|---|---|---|---|---|---|
| 2 | 7 | 50 | 4.096 | 3.568 | 57.5 | 16.1 |
| 3 | 1 | 100 | 7.898 | 7.370 | 115 | 15.6 |
| 1 | 5 | 200 | 15.29 | 14.762 | 230 | 15.6 |
| 2 | 6 | 400 | 29.82 | 29.292 | 460 | 15.7 |
| 1 | 3 | 300 | 20.88 | 20.352 | 345 | 17.0 |
| 3 | 1 | 200 | 16.29 | 15.762 | 230 | 14.6 |

slope: 15.822 pg/PA

| SAMPLE ID | bub vol (ml) | PA | pg HgT | FLASK # | SAMPLE WEIGHT | FLASK WEIGHT | FLASK + liquid | dil vol. | total ng Hg | blank corr ng Hg | ug/ g wet | duplicate ave | | duplicate %rsd | wet:dry | ug/ g dry |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blank 1 | 0.5 | 0.5564 | 8.80 | 6 | 0 | 36.71 | 87.53 | 50.82 | 0.895 | | | | | | | |
| Blank 2 | 0.5 | 0.3768 | 5.96 | 7 | 0 | 36.78 | 88.01 | 51.23 | 0.611 | | | | | | | |
| | | | | | | | | ave | 0.753 | | | | | | | |
| | | | | | | | | stdev | 0.201 | | | | | | | |
| Crab 1 | 0.050 | 20.11 | 318.18 | 1 | 2.657 | 36.77 | 86.60 | 49.83 | 317.1 | 316.3 | 0.1191 | | | | | |
| Crab 1 | 0.025 | 6.23 | 98.57 | 1 | 2.657 | 36.77 | 86.60 | 49.83 | 196.5 | 195.7 | 0.0737 | 0.0964 | | | 4.33 | 0.418 |
| 2A | 0.025 | 7.254 | 114.77 | 2 | 2.450 | 36.35 | 88.24 | 51.89 | 238.2 | 237.5 | 0.0969 | | | | | |
| 2B | 0.025 | 8.327 | 131.75 | 4 | 3.255 | 36.88 | 88.27 | 51.39 | 270.8 | 270.1 | 0.0830 | | | | | |
| 2C | 0.025 | 8.207 | 129.85 | 5 | 2.843 | 36.28 | 87.39 | 51.11 | 265.5 | 264.7 | 0.0931 | 0.0910 | 0.0072 | 7.9 | 4.63 | 0.421 |
| 3 | 0.025 | 6.567 | 103.90 | 8 | 2.604 | 36.30 | 89.23 | 52.93 | 220.0 | 219.2 | 0.0842 | | | | 4.84 | 0.407 |
| 4 | 0.050 | 12.500 | 197.78 | 9 | 2.311 | 39.81 | 93.01 | 53.20 | 210.4 | 209.7 | 0.0907 | | | | 4.31 | 0.391 |
| 5A | 0.025 | 6.817 | 107.86 | 10 | 3.002 | 39.97 | 92.45 | 52.48 | 226.4 | 225.7 | 0.0752 | | | | | |
| 5B | 0.050 | 12.10 | 191.45 | 41 | 2.941 | 41.00 | 94.97 | 53.97 | 206.6 | 205.9 | 0.0700 | | | | | |
| 5C | 0.050 | 13.22 | 209.17 | 42 | 2.475 | 40.34 | 93.20 | 52.86 | 221.1 | 220.4 | 0.0890 | 0.0781 | 0.0098 | 12.6 | 4.56 | 0.356 |
| 6 | 0.025 | 5.31 | 83.98 | 43 | 3.024 | 40.12 | 94.38 | 54.26 | 182.3 | 181.5 | 0.0600 | | | | 4.25 | 0.255 |
| 7 | 0.025 | 6.10 | 96.53 | 44 | 2.667 | 40.42 | 94.25 | 53.83 | 207.8 | 207.1 | 0.0777 | | | | 4.35 | 0.338 |
| dorm | 0.025 | 17.56 | 277.83 | 45 | 0.126 | 41.28 | 95.12 | 53.84 | 598.3 | 597.6 | | | | | | 4.74 |
| | | | | | ave. mass | | | | 3X std dev Bl | | detection limit | | | ave %rsd | | detection limit |
| | | | | | 2.74 | | | | 0.602 | | 0.00022 | | | 10.3 | 4.47 | 0.0010 |

Wet Dry Determination
Site: Crabs

| Pot # | Sample | Tare Wt. | Pot w/wet | Wet Wt. | Pot w/dry | Dry Wt. | Wet:Dry | %Moisture |
|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 0.5 | 4.746 | 4.246 | 1.48 | 0.98 | 4.333 | 76.9 |
| 2 | 2 | 0.522 | 4.366 | 3.844 | 1.352 | 0.83 | 4.631 | 78.4 |
| 3 | 3 | 0.499 | 4.109 | 3.610 | 1.245 | 0.746 | 4.839 | 79.3 |
| 4 | 4 | 0.542 | 4.608 | 4.066 | 1.486 | 0.944 | 4.307 | 76.8 |
| 5 | 5 | 0.529 | 3.473 | 2.944 | 1.175 | 0.646 | 4.557 | 78.1 |
| 6 | 6 | 0.536 | 5.008 | 4.472 | 1.587 | 1.051 | 4.255 | 76.5 |
| 7 | 7 | 0.557 | 4.782 | 4.225 | 1.529 | 0.972 | 4.347 | 77.0 |

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December 8, 2006

Dear Ms. Steffensen,

Environment International Ltd. is pleased to provide you with these comments related to sections of the Draft Supplemental Remedial Investigation & Feasibility Study for the Whatcom Waterway Site in Bellingham, Washington. As you requested, these comments are focused on the sections of "Volume 2: FS Report" that relate to capping and dredging technologies, and their analysis and selection as parts of preferred remedies at the site.

Overall, this document reads as though the final remedies were selected, and the
document was written to support those choices – the opposite of the proper process for
remedy selection. Dredging and capping are both choices with complex technical
requirements for success; this document should provide a better scientific analysis of the
engineering criteria for selecting one or the other to remediate a given portion of the site, 64
instead of simply lobbying for the favored (cheaper) technology.

As the erosion of the existing Log Pond cap has shown, caps are not perfect, and can fail
in unexpected ways, even when modeled prior to construction. In the case of this remedy
selection process, it appears that short-term risks and costs are being given
disproportionate weight over long-term risks and benefits. For example, capping has a 67
greater long-term risk than dredging, because of the possibility of unforeseen events
(such as an intense storm or seismic event) stirring up the contamination that still lies
beneath the cap. Unfortunately, in this remedy selection this risk is given much less
importance than the estimated cost in dollars, a factor which ends up feeding into several 65
aspects of the disproportionate cost analysis. The only way to permanently reduce the
risks posed by these contaminated sediments is to remove them completely, a concept not
given sufficient emphasis in this document. Our specific comments follow.

Page 5-5 (page 72): **Capping description.** Section 5.3.1, "Sediment Capping"
introduces the concept of capping in an extremely optimistic light. Although it is
certainly not unacceptable to present examples of successful Puget Sound caps, this
document should present a neutral viewpoint, so it is useful to also include less successful 66
caps, and a description of why all examples (positive and negative) would or would not
be comparable to the areas of the Whatcom Waterway under discussion (what qualities
are shared: volume and nature of boat traffic, contaminant type, etc.). For instance, the
Eagle Harbor/Wyckoff site just off Bainbridge Island also had regions of high mercury
concentration. An analysis of that example in light of how its dredging and caps have
succeeded and failed would be instructive. Other examples could include Pier 64 in
Seattle (capping around infrastructure), ALCOA/Grasse River in Massena, NY (steep
side slopes), and Boston Harbor and New Bedford Harbor in Massachusetts (for CAD
disposal examples).

In noting the success of the Duwamish River cap, the authors imply that a 22-year lifetime can be expected for the caps under discussion in the Whatcom Waterway, yet there is no evaluation of how the Duwamish cap compares in terms of physical factors with the proposed Whatcom Waterway caps. In addition, the most recent monitoring data cited for the Duwamish cap are 11 years old. The lack of more recent data means that there is no way to be sure whether or not the cap is still performing successfully. If there are more recent data available, they should be presented. If not, the use of 1995 data only verifies an 11-year lifespan (1984-1995), and cannot be interpreted to imply continued isolation of contaminants.

An estimated lifetime of the proposed caps is never put forward, in this section or in the
more specific sections 6 and 7, other than an implied comparison with the cap in the 68
Duwamish. In order to properly compare the capping options with dredging, an
estimated lifetime for the cap including specified amounts of maintenance and/or a date
for eventual replacement should be discussed.

There is only brief mention of reactive caps, in which part of the cap is composed of a
material that can selectively take up contaminants of concern (COCs). The material can
either isolate the COCs by making them chemically unavailable for biological uptake, or 69
can lead to the permanent removal of COCs if the material is harvested. This is
promising technology that should be explored further for areas in which capping is
selected as the preferred remedy. This technology is given further discussion in section
5.7.2, "Reactive Caps," on pages 5-36 and 5-37 (pages 103-4), but is ultimately not
retained for consideration. Given that any solution that provides a permanent way to
sequester or remove contaminants is better than not removing them, this option deserves
a closer analysis.

Page 5-8 (page 75): Long-term monitoring is mentioned as a cost of capping, but long- 70
term maintenance is not. We re-visit this issue in the comments on Appendix B.

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Page 5-11 (page 78): **Dredging description.** In section 5.4, "Sediment Removal,"
dredging is given a much more extensive, yet less optimistic treatment than capping. The
obvious advantage to dredging – that it entails permanent removal of contamination – is
not stated. Examples of dredging projects from the Puget Sound and elsewhere (such as
the Hylebos Waterway in Tacoma) and their similarities and differences are not given.
Legitimate considerations are discussed. However, in the capping description section, the 72
drawbacks and issues with that technology are not given a similarly thorough treatment –
only two bulleted lists of "decision factors" (pages 5-6 to 5-8). The document should
include a much more complete analysis of considerations and concerns with capping,
perhaps by using the bulleted lists as a starting point and evaluating each point with
respect to proposed capping areas in the Whatcom Waterway.

On page 5-20 (page 87), the "Sediment Accessibility" section exemplifies this disparity.
While difficulty dredging under piers is discussed, and the capping description section 73
has no corresponding section illustrating the problems with capping near pilings.

Dredging is a preferred option in cases where there is contamination by a persistent, bioaccumulative toxin (PBT) in an area that can be cordoned off from a greater body of water, greatly reducing any short-term risk from sediments stirred up by the dredging process. The Log Pond and indeed the entire Whatcom Waterway could be effectively isolated in this manner during the dredging process, either through the use of sheet-pile walls or silt curtains. The use of silt curtains is discussed negatively on page 5-22 (page 89), where the Waterway's river current and tidal range are implied to be too great for the use of that technology. Instead of dismissing this inexpensive and useful tool, a test should be performed to determine whether site conditions really prohibit its use. As an example, a current bridge construction project on the East Coast includes the following in its information: "Though originally thought by some to be questionable due to strong currents and tidal cycles, the use of turbidity curtains across the Woodrow Wilson Bridge Project has proven to be an effective and versatile tool to minimize environmental impact..." 74

Table 5-1 (page 106): For the first time, the lower cost of capping is referenced. If this is a summary of previous sections, this issue should have been discussed in the capping section so that the veracity of the assumptions behind it could be judged, independent of this stand-alone statement.

Page 6-19 (page 128), et al.: Throughout Section 6, "Description of Remedial Alternatives," side-slope stability is cited as a reason to be concerned about dredging in certain areas of the Waterway. The counter-argument that is not given is that caps on steep side-slopes are also not ideal. Dredging the area, even if sidewall support is necessary, is a better choice than a cap placed under marginal conditions. #12-N

Page 7-6 (page 173): Throughout section 7.2, "Detailed Evaluation of Alternatives," the cost analyses do not include long-term maintenance of capped areas, and do not provide a specific duration of "long-term monitoring." We re-visit this issue in the comments on Appendix B. 75 76

Page 9-2 (page 239): "Higher-cost alternatives were determined to be impracticable, because their incremental costs were substantial and disproportionate to the incremental benefits of those alternatives." Please see the comment below regarding Appendix B. It is impossible to determine the actual incremental cost difference between alternatives from the analysis, because the costs of capping do not include adequate reserves for long-term monitoring and maintenance. #12-O

**Appendix B** (Costs):
The cost assumptions on which the final cost for each alternative is based are flawed. Each of the eight alternatives includes capping to a greater or lesser extent. In fact, each contains an entirely unique capping configuration. Yet the cost for "long-term environmental monitoring" is, in each case, either $640,000 or $1,040,000. This is problematic for several reasons.

1. "Long-term" is not defined in the document. Does this mean five years, ten, twenty, or longer? The cap must be monitored in perpetuity, as the contamination will always be present. Twenty years is an acceptable amount of time to project 77

costs of this nature, given that the time horizon is far enough away that we cannot reasonably predict what alternative technologies will exist at that point.

2. "Environmental monitoring" is not defined anywhere in the document. In the case of sediment caps, it typically has three aspects: bathymetry studies, chemical analysis of samples, and diver inspection. These should be performed more often immediately after cap placement, with decreasing frequency as the cap's efficacy 78
is established. Rigorous inspection by all three methods should take place at least 1, 2, 3 and 5 years after cap placement, with subsequent monitoring every 5 years. Local costs for these services are readily available, and should be included in the cost analysis in the same way as all the other services.
3. Each alternative involves a different capping situation, with widely varying acreage covered and cap volumes (according to Table A-1 in Appendix A). How can the same numbers apply to so many situations? The only reference given for 87
these numbers is "professional judgment." This is not sufficient. There must be greater transparency as to how these numbers were calculated and what they include.
4. The cost apparently does not include long-term maintenance of the cap. The cap is not a static object, and even the best ones will require periodic fixes. There 88
must be a line item included for this cost, as well as a note about what it covers (i.e., repair of 5% of the cap surface annually for 20 years).

Long-term costs of capping are frequently underestimated, sometimes by a large margin if extensive unanticipated repairs are necessary. In this case, selection of a preferred remedy rested heavily on cost. As stated on page 7-3 (page 170), "Costs are intended to be comparable among different project alternatives to assist in the overall analysis of relative costs and benefits of different alternatives. Costs are evaluated against remedy benefits in order to assess cost-effectiveness and remedy practicability." If an artificially low cost of capping has been cited, a fair comparison cannot be performed. It has been our experience that once all costs are accurately accounted for, the difference in cost between capping and dredging a given area can be much closer than has been demonstrated in this document. However, even if the upfront cost for a dredge solution is more expensive than that for a cap solution, the cap solution is not preferred because of the higher uncertainty and risk it engenders.

We hope these comments help you make informed choices about how to respond to the remedy selection at the Whatcom Waterway site.

Sincerely,

Whitney Fraser
Craig Christian, P.E.
Dr. Pamela Bridgen
*Environment International Ltd.*

#122-F

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Wendy Steffensen**

Wendy Steffensen. North Sound Baykeeper with Re-sources. The North Sound Baykeeper has been involved in the Whatcom Waterway cleanup, looking at the documents, assessing what the best possible thing is to do since probably 96 or 97 and I've been on board for about the last four years. So we've been looking at this issue diligently and with that we have a position and I will briefly state the position.

We would like a full dredge removal of mercury in the water, in the Whatcom Waterway and the
ASB and lagoon as well as at the GP Log Pond – where ever the mercury is above the minimum
contamination level. We would also like upland disposal of that mercury contaminated sediment. 89
We do not want the contamination put into the ASB because that's near the water.

We would like the ASB returned back to aquatic usage. Now I realize that is a huge order, that's 90
a huge order. So with that said, I'll say that we realize there are some places where it's most
important to actually remove the mercury. That's where it's basically hottest, where it's most hot
and where it's actually easiest to get it out. So I would say we're looking at the GP Log Pond and
the Inner Whatcom Waterway and the lagoon. We know that you can drive sheet pile in at the
end of that Whatcom Waterway to isolate it, to minimize the short term risks through sediment 91
dredging and that way we could actually remove the bulk of the mercury without having too
much sediment resuspend and recontaminate the area.

In addition there is the southwest corner of the lagoon where there is a lot of erosion occurring. That spot really needs to be addressed as well, because we're potentially going to have mercury dispersal from that site as well.

Two sites that we have concern about but I found very little data about are the head of the 92
Whatcom Waterway. I actually only find one sample taken there and so in order to kind of
assuage the concerns of the community I think we really need to take a second look at the head
of the Whatcom Waterway as well as at Star Rock. I have not seen any detailed information on
what the subsurface at Star Rock looks like. All I see in the latest RIFS is that Star Rock area
passes in terms of surface sediments.

So that's kind of the North Sound Bay Keeper position in a nutshell. I have some more detailed comments that go with this and I also have handouts if anyone is interested later. So the biggest question for our, for the RIFS is do we dredge or do we cap? I actually had for a small piece of money a consultant take a look at Volume 2 of the RIFS because dredging and capping is not exactly my bailiwick. So I said take a look at this and Environmental International came back with basically the comment that said as we have all said they have confirmed that this RIFS really looks like it is written with a solution in mind. Basically the document is written to the solution and they also said that in addition the capping and dredging analysis was very obviously it was slanted the document said yes we can do capping and these are all the very good reasons we can do capping and kind of the dredging argument was given short shrift.

**Moderator**
You have about a minute left.

**Wendy Steffensen**
Ok I've got a lot more to say. So what I will say about what we haven't looked at in terms of capping is capping does not work in areas that are steep and that have pilings and structures and that is part of the reason why we have the Log Pond failure. The Whatcom Waterway is going to present a similar situation and that hasn't been addressed. So in your response to comments when you're looking at capping and dredging, please look at piece by piece why would capping work here why would dredging work here? Let's not give an answer that would, that is the cheapest answer and that will answer these land use questions. Let's give the answer that makes the most sense from a technical and protective viewpoint and I'll stop here even though I have a lot more to say. Thank you. 93

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Robin Dupre**
Hi, my name is Robin Dupre and I wasn't going to comment because, well, it's all redundant. I do however point out that I started working on the Bellingham Bay Pilot in about 1996 and for a long time I was the only citizen that would go to every single meeting and I'm appalled that we're all still having this conversation 10 years later. In my mind it's not about what we do with a marina. If you want to have your marina, great! So here's the deal I challenge the Port of Bellingham and the Department of Ecology to set aside the marina. Make that decision later. Do the best cleanup now. Then if you want a marina, you want a shipping channel, you want salmon habitat, you got it because your options are not foreclosed. So with the Port, and I recognize this isn't a referendum on the Port, but if the Port would like a marina, I would like to challenge the Port of Bellingham to offer the citizenry something in return and that's a clean bay. And they might find a whole lot less resistance to their marina concept in the end.

So you two and all the staff and cleanup are troopers. You have been doing this for a very long time. I'm sure Lucy, you would like to do something and not retire from the Bellingham Bay Pilot project, but we may all if we don't make this choice now and make a decision is protective in the long term and the decisions that we're being faced with appear with the new capping data to not even be protective in the short term. So why are we being offered those things?

So, long term in my mind doesn't mean 5 years from now, it doesn't mean 10 years from now. To me long term means my little grandchild, who is now 4, is dead and gone. That's long term.

Thanks.

Commenter No. | Name / Organization
123 | Rex, RJ

Commenter Submittals:
A	E-mail dated Dec. 15, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Additional habitat | Opposes ASB fill. Favors habitat ASB reuse. | 5.22 |
| 3 | EIS | Alternative ASB uses | Favors habitat reuse of ASB | 6.9 |
| | | | | |

**Notes:**

EIS	Supplemental Environmental Impact Statement
FS	Feasibility Study (Volume 2 of Supplemental RI/FS)
RI	Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS	Responsiveness Summary (Narrative)

1

-----Original Message-----
From: RJ Rex [mailto:erejota@hotmail.com]
Sent: Friday, December 15, 2006 12:39 PM
To: McInerney, Lucy (ECY)
Subject: bellingham bay contamination clean up

I advocate for the complete removal of contaminated sediments. 2

Landfilling the sediments in the ASB is my 2nd favorite option.
However, I don't like this option.
It fatally compromises a 25 to 30 acre area that should be returned to 1
aquatic habitat.
It destroys 4,000 to 5,000 feet of potential shoreline habitat.
There is a potential health risk to landfilling the ASB. 2

Complete removal... please.

Sincerely, RJ Rex
2716 G street

| Commenter No. | Name / Organization |
|---|---|
| 124 | Rhodes, Richard |

Commenter Submittals:

A  E-mail dated Nov. 28, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS/EIS | Additional habitat | Favors habitat resuse of ASB | 5.22 & 6.9 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

1

**From:** Rick/Sheila [rhodesfam@nas.com]
**Sent:** Tuesday, November 28, 2006 4:10 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham Bay Cleanup

Please:

Fullly dredge removal of all mecury in the Whatcom Waterway, ASB lagoon and adjacent areas wherever it occurs above the Minimum Cleanup Level (0.59 parts per million) until the contamination is fully removed. 2

Complete upland disposal of mercury-contaminated sediments to a certified and protective upland landfilll, designed & sited specifically for waste disposal.

Return ASB lagoon to aquatic habitat to function as land that once existed as part of the larger Whatcom Creek Estuary. 1

Thank you, Richard A. Rhodes
360-733-6809

Commenter No. Name / Organization
125 Richards, Skip

Commenter Submittals:

A E-mail dated Dec. 13, 2006
B Attachment to Dec. 13th E-mail

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 2 | FS | Log pond concerns | Concerns about Log Pond cap performance. | 5.14 |
| 3 | FS | Cleanup standards | Potential future changes to cleanup levels | 5.30 |
| 4 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A



From: Catalyst Consulting [cdl@catalyst-consulting.com]
Sent: Wednesday, December 13, 2006 5:27 PM
To: McInerney, Lucy (ECY); Catalyst Consulting
Subject: comments on GP site cleanup plan

Attachments: Comments on clean up plan.doc

Attached please find comments I would like submitted for the record.

Thank you,

Skip Richards
360 738 9544 ext 2

To: Lucille McInerney, Department of Ecology 1

From: Skip Richards

Date: 061214

Re: Comments on proposed clean up of Bellingham Bay

Recently I saw a clean up cost table from a Murphy Evans article in ***Cascadia Weekly*** 061206:

**PUBLIC COSTS OF CLEANUP ALTERNATIVES**

| | ALT 3: ASB AS LANDFILL | | ALT 6: ASB AS MARINA | | ALT 7: FULL CLEANUP | |
|---|---|---|---|---|---|---|
| BENEFITS | Clean waterway | | Enormous "ocean marina" | | Clean waterway plus marina | |
| WHAT'S INVOLVED | Dredge & transfer toxins from waterway to ASB | $34 | Dredge & truck away ASB sludge | $26.8 | Dredge & truck away ASB sludge | $26.8 |
| | | | Cap mercury in Whatcom Waterway | $17.2 | Dredge & truck away waterway toxins | $47.2 |
| TOTAL COST | | $34 | | $44 | | $74 |
| INSURANCE PAYS | | $17 | | $8.6 | | $23.6 |
| STATE PAYS | | $17 | | $22 | | $25 |
| LOCAL TAXPAYERS PAY | | $0 | | $13.4 | | $25.4 |

SOURCE: Dept of Ecology cost estimates; cost in millions

Cost estimates like these remind me of remodeling an old house – you always start out with optimistic costs, and you're always wrong. Usually by a factor of three, or thereabouts. The longer the project takes, the greater the cost, even if the scope of work remains the same.

One of the problems is the missing costs, such as the costs of monitoring the effectiveness of the cleanup plan. 2
Monitoring isn't politically sexy, and usually gets short shrift when push comes to shove during budget time, but it's crucial to track your effort to see if it's actually working.

So I'm skeptical of all these numbers, and in light of that result I have struggled to find some bedrock principle upon which to base a reasonable choice.

I'm concerned about the problem we'll have in the future, if it turns out that the assumption that capping the 1
waste in place will work. Earthquakes, anyone? How well has covering it up worked in the log pond?

And I'm especially skeptical of the notion that we can leave the upland areas for now, because the contamination won't reach the water for 30 years. First, that assumption might be wrong. Even if that assumption is correct, however, the longer we wait to address any aspect of cleanup, the more costly it will be when we finally get around to it. The costs of trucking waste out of the area will only go one way: UP. What will fuel cost ten, twenty, or thirty years from now? $5 a gallon? $10? More? As time passes, will approved disposal sites become closer and more numerous, or further away and fewer? Will standards for acceptable 2
levels of contamination become more stringent, or less so?

Cleaning up ALL of the mess, NOW, has at least this benefit that no other choice does: the costs are all up front; you pay once, and you're done. So from a strictly economic point of view, maybe more thought should be given to this whole effort before barging ahead with a single alternative because it appears on the surface to be less costly.

When reviewing the various clean up alternatives and their costs, it looks to me like Alternatives 3 and 7 are more preferable, in terms of cost-benefit, than Alternative 6. 3

If, by some ironic twist in MTCA, the land use decisions already made preclude Alternative 3, then I question whether Alternative 6 is really going to wind up being less costly, over the life cycle of the project, than Alternative 7.

I'm sorry GP is gone, along with all the good paying jobs it provided. I hope the decisions made through this process bring at least as much prosperity as GP did, and for far longer, without the pollution. They won't, unless we get this cleanup decision right the first time.

Commenter No. Name / Organization
126 Riek, Bob

Commenter Submittals:
A E-mail dated Dec. 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Bob Riek [mailto:bobriek@gmail.com]
**Sent:** Saturday, December 16, 2006 11:41 AM
**To:** McInerney, Lucy (ECY)
**Subject:** Bay clean-up project

Dear Ms. McInerney,
I live in the county, but belong to a walking group that enjoys walking along the bay and the marina. I have attended several planning meetings and feel that I have had a chance for input as the plan has progressed. I am in favor of the preferred alternatives 5 and 6 as they have been presented. Thank you for considering my thoughts. 1
Bob Riek

--
Bob Riek

Commenter No. | Name / Organization
---|---
127 | Riek, Marsha

Commenter Submittals:

A Letter dated Dec 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 3 | EIS | Land use changes | Support for land use changes | 6.6 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Marsha Riek [mailto:nwnewsy@gmail.com]
**Sent:** Saturday, December 16, 2006 11:12 AM
**To:** McInerney, Lucy (ECY)
**Subject:** Bay clean-up plan

Dear Ms McInerney,

I am writing to you to express my support of the bay plan clean-up plan as expressed in
the draft RI/FS and EIS documents for the Whatcom Waterway site. I also support 1
alternatives 5 and 6. As a Whatcom county resident, I feel strongly that we need to use
this wonderful opportunity to add marine space which will impact this community
positively with healthy outdoor activities. It will also provide much needed tax dollars 2
with all the boat related businesses and recreational dollars spent locally. We have an
opportunity to plan a bay area that would be world class. Thank you for your 1
commitment to making a legacy for Bellingham's future.
Sincerely,
Marsha Riek

Commenter No. Name / Organization
128 Rosati, Marissa

Commenter Submittals:
A Letter dated Dec. 12, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

December 12, 2006

Marissa Rosati
711 Gladstone St.
Bellingham, WA 98225
360-714-1307

**Lucille T. McInerney**
Site Manager
Department of Ecology
Northwest Regional Office
3190 160th Avenue
Bellevue, WA 98008-5452

Dear Ms. Lucille McInerney,

I am writing to urge the Department of Ecology to clean up Whatcom Waterway and the former Georgia Pacific Site to the highest standards and not to accept Alternative 6. Mercury and other toxins must be removed out of the marine environment.

Our bodies and our bay need to be mercury free today and in the future. Let me remind you that the Mission of the Department of Ecology is to *protect, preserve and enhance Washington's environment, and promote the wise management of our air, land and water for the benefit of current and future generations.* I believe Alternative 6 fails your mission and fails to be wise management of our air, land and water. It also fails to benefit current and future generations.

I don't want to leave a legacy of buried mercury and toxins to our next generation and those that follow. Methyl mercury is very harmful to humans so, I ask for mercury to be removed. 1

Furthermore, I believe removing the mercury in Whatcom Waterway makes the most fiscal sense *in the long run.* Get it out and dispose of it properly so we don't have to revisit this issue in the future.

I hope the Department of Ecology will succeed in its mission, and require the Port of Bellingham to clean up the mercury and other toxins in Whatcom Waterway. And with this success, the community of Bellingham can live in clean place and not have to visit this issue ever again. For the love of this community, the environment and future generations...let's clean it up... mercury is forever.

Sincerely,

Marissa Rosati

Marissa Rosati

| Commenter No. | Name / Organization |
|---|---|
| 129 | Rubash, Bert |

Commenter Submittals:

| | | |
|---|---|---|
| A | E-mail dated Oct. 31, 2006 | |
| B | Letter dated Nov. 27, 2006 | (Duplicate comments to #129-A) |
| C | Letter dated Nov. 27, 2006 re: BSL | |
| D | Data tables submitted to Ecology on CD-ROM | |
| E | Regression ouputs submitted to Ecology on CD-ROM | |
| F | Rregression plots submitted to Ecology on CD-ROM | |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | RI | Natural recovery | Comments about natural recovery estimates | 4.6 |
| 2 | RI | Water circulation | Comments about circulation patterns | 4.15 |
| 3 | RI | Water circulation | Comments about circulation patterns | 4.15 |
| 4 | RI | Natural recovery | Mass balance estimate of sedimentation | 4.6 |
| 5 | FS | Natural recovery | Potential for natural recovery rates to change | 5.15 |
| 6 | RI | Natural recovery | Potential for natural recovery reversal | 4.6 |
| 7 | RI | Natural recovery | Request for sediment budget in RI | 4.6 |
| 8 | RI | Natural recovery | Comments about natural recovery estimates | 4.6 |
| 9 | RI | Water circulation | Comments about circulation patterns | 4.15 |
| 10 | RI | Water circulation | Comments about circulation patterns | 4.15 |
| 11 | RI | Natural recovery | Mass balance estimate of sedimentation | 4.6 |
| 12 | FS | Natural recovery | Potential for natural recovery rates to change | 5.15 |
| 13 | RI | Natural recovery | Potential for natural recovery reversal | 4.6 |
| 14 | RI | Natural recovery | Request for sediment budget in RI | 4.6 |
| 15 | RI | BSL Basis | Regression analysis methods | 4.3 |
| 16 | RI | BSL Basis | Uncertainty of regression analysis | 4.3 |
| 17 | FS | Disproportionate cost analysis | Analysis of alternative benefits | 5.25 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

Bert and Elizabeth Comments on RIFS for Bellingham Bay Cleanup
From: Bert Rubash and Elizabeth Kilanowski [kilaruba@copper.net]
Sent: Tuesday, October 31, 2006 2:34 PM
To: lpeb461@ecy.wa.gov.
Subject: Comments on RI/FS for Bellingham Bay Cleanup

Below are comments on the Supplemental Remedial Investigation & Feasibility Study, Volume 1: RI Report, Part 3, Environmental Setting, Section 3.1, Physical Conditions, Subsection 3.1.2, Surface Water and Circulation Patterns, prepared by The RETEC Group, Inc.

This subsection was chosen for review because it doesn't appear to have been as carefully crafted as the rest of the RI/FS, although it contains an elaboration of a key operational assumption that informs and justifies the larger project. A statement of that assumption might be: 'We know enough about the dynamics of the bay to reliably predict where to look for the remains of Georgia Pacific's toxic waste, where it would be safe to leave some of it, how safe leaving it there would be, and how to monitor the security of what's left.'

Sediment source.

To make such an assumption we would need good estimates of the physical quantities involved. Unfortunately, one of the first quantities given, the annual discharge for the Nooksack River is ambiguous and unreferenced (1). The figure, 650,000 cubic meters of sediment discharge, is 5274 times smaller than the USGS figure for the mean water discharge for the years 1967-2000 at Ferndale: 3839 cfs (= 109 cubic meters/second => 3,430,000,000 cubic meters/year) (2). Combining the two discharges we have 1,000,000/5274 = 190 cubic centimeters of sediment in an average meter of Nooksack water. That's a little less than a cup, surprising, but reasonable. Was sediment volume measured, derived, guessed? We shouldn't have to wonder about its source, meaning, and validity. Are we be expected to search through the references listed at the start of the subsection (3) to find which document and which page contains the estimate and describes how the estimate was made?

Water exchange.

Less reasonable than the sediment volume figure is the assertion on page 3-6 that "The residence time for water in Bellingham Bay is typically four to five days, but varies between one and eleven days." 1

Studies of lakes and estuaries employ three measures of renewal, residence time, age, and flushing time (4).

Residence time, is the time elapsed from a water parcel's entry at a specified starting point until its departure. Age is the time elapsed since a parcel entered a water body, and the age of a water body is the average age of all water parcels. Flushing time, a more general measure, is the ratio of total volume (or mass) of water to its rate of renewal due to flow across boundaries. Flushing time is often also called residence time.

The context of RETEC's residence time assertion is a discussion of "oceanic" waters "entering" and of water "exchange", not a discussion of particular water masses or of masses from a particular source, so it seems safe to assume that flushing time or something close to it is what RETEC had in mind. 2

We can approximate RETEC's derivation of the residence time figure by assuming that the bay is thoroughly mixed on a time scale much smaller than the residence time, and by assuming that water flows through the bay, not in and out of the bay. (Assume a river, not an estuary.)

The surface area of the semi-enclosed region between Samish Island and the Nooksack delta is 250,000,000 square meters; the volume of water is

5,650,000,000 cubic meters, in round figures (5). Using a tidal range of 3 meters, a tidal cycle of 24 2/3 hours, and Nooksack discharge of 9,680,000 cubic meters per tidal cycle derived from the USGS discharge figure above, we would have 3 X 250,000,000/24 2/3 = 30,400,000 cubic meters per hour moving through. It would take 5,650,000,000/(24 X 40,540,000) = 7.7 days to exchange the water in the bay at that rate, hence the "typically four to five days but varies between one and eleven days" assertion in the RI/FS, although the shorter times require more radical assumptions. A 4 meter tidal range would yield 5.8 days. 1

This may be a good estimate of water volumes surging back and forth past the southern end of Lummi Island, but it is not a good estimate of water exchange in the bay, that is, of residual tidal flow. The thoroughly mixed and through-flowing water assumptions are fatally unrealistic: the bay has strong vertical density stratification, and the tides flow in and out; residual tidal flow (over a cycle) is much smaller than instantaneous flow for most of the bay, approaching instantaneous flow rates only near the open boundaries.

The areas and volumes used above are taken from the model configuration for the work described in a poster at the June 4-9 2006 American Society of Limnology and Oceanography conference in Victoria. That poster described detailed computing and mapping of the flushing time of Bellingham Bay. Normal overall flushing time for the bay was determined to be 485 hours (20 days) with much longer times, an order of magnitude longer for a region of bottom waters in the northern part of the bay (5).

Sediment accumulation.

Using information in subsection 3.1.2 to estimate the sediment available for deposition.illustrates how that subsection is related to the larger remediation project. In that subsection we read that "there is a net southward flow throughout Bellingham Bay at depth, largely resulting from the lateral and vertical spreading of the Nooksack River discharge." We have read in 3.1.2 that the bay is an active water body with a residence time of a few days. 650,000 cubic meters of sediment is carried into that net southward flow. In such conditions sediments would be carried far and wide beyond the edge of the delta into the bay, sediments that would provide the natural capping of toxin containing sediments discussed in the RI/FS. (We also made the contrasting assumption that Georgia Pacific's waste settled near where it was dumped.)

How much capping we can expect? If we make the conservative assumptions that the accumulation on the tide flats at the delta does not divert a significant part of the sediment load, and that all of the sediment settles in the northern third of the bay, we can expect that 650,000 cubic meters of sediment will be spread over 250,000,000/3 square meters, which is 0.78 centimeters annual accumulation. 2

The empirical analysis in Section 6.2.1, Table 6-1 of the RI/FS indicates twice that rate of deposition in the inner harbor area, 1.6 centimeters per year. This discrepancy means that the estimate of the amount of sediment available is too low, or that Squalicum and Whatcom creeks supply significant sediment, or that sediment deposition is uneven and presently greater in the area of the inner harbor.

If sediment deposition is uneven, how confident can we be that circulation, and the related depositional and erosional patterns will not change with land use changes and with climate change? A 1961 University of Washington master's thesis on Bellingham Bay sediments states that the growth rate of the sediments over the last 70 years is 900,000 cubic yards (823,000 cubic meters) per year, and that the growth of the delta in that period "is nearly as great as the total previously existing delta"(6). That statement should warn us that present sedimentation rates in the bay are transitory. 3

The geography and dynamics of sediment transport in the bay are also transitory, far more transitory. The largest Nooksack channel through the tide flats meanders along the northeastern shore, and conveniently directs the heaviest sediment plume toward Boulevard Park. How rapidly will that change; how soon will it meander elsewhere; how quickly will one of the meandering western tide flat channels deepen and carry the heaviest load to the west side of the bay? In short, how securely can we trust that some of the depositional environment we are counting on will not become erosional? #4-B

RI/FS improvement.

If the role of the RI/FS is to provide a basis for public confidence that enough is known about how the bay works to plan for safe, comprehensive remediation of Georgia Pacific's toxic legacy, then it needs improvement. Below are three suggestions.

The RI/FS needs better overall consistency. Since sediment deposition is predicted and required, it needs a sediment budget, a geographic sediment budget that accounts for delta growth and for transport dynamics.

The RI/FS also needs a mercury budget in order for the public to gage how well mercury itself, and the other toxins in the inner bay sediments are encompassed by the RI/FS. 4

A final suggestion to improve Subsection 3.1.2 would be to edit all unsubstantiated assertions: everything submitted for public review should be substantiated by derivations or by field data with documentation of methods, or by references that lead to derivations or field data. Everything that is not substantiated should be clearly identified as public relations information not intended for review. Expecting the public to trust the undocumented assertions of consulting experts is contrary to democratic principles and not a proper function of public agencies.

Bert Rubash
Physical Oceanographer
Raincoast GeoResearch
kilaruba@copper.net

(1) "The Nooksack River is also the primary source of sediments to the bay, with an annual discharge of 650,000 cubic meters." quoted from page 3-5 of the RI/FS.

(2) See http://wa.water.usgs.gov/realtime/adr/2000/data/12213100.2000.sw.pdf for USGS discharge data.

(3) "Collias et al. (1966), Shea et al. (1981), and Broad et al. (1984) have previously described the physical oceanography of Bellingham Bay. In addition, a recent study of inner Bellingham Bay currents was performed by Colyer (1998)." quoted from page 3-5 of the RI/FS.

(4) See Monsen, N.E., Cloern, J.E., Lucas, L.V., and Stephen G. Monismith, G., 2002. A comment on the use of flushing time, flushing time, and age as transport time scales. Limnol. and Oceanogr. 47: 1545-1553.

(5) Consistent and Accurate Calculation of Estuarine Flushing in Bellingham Bay Using an Ocean Circulation Numerical Model, Rubash, L, L, Kilanowski, E, M, http://www.sgmeet.com/aslo/victoria2006/.

(6) Richard W. Sternberg, 1962, Recent Sediments in Bellingham Bay, Washington, Master of Science thesis, University of Washington, page 57.

4

To: Department of Ecology



**From**: Bert Rubash
Physical Oceanographer
Raincoast GeoResearch
PO Box 2206
Bellingham, WA 98227
kilaruba@copper.net

**Date**: November 27, 2006

Comments on the Supplemental Remedial Investigation & Feasibility Study, Volume 1: RI Report, Part 3, Environmental Setting, Section 3.1, Physical Conditions, Subsection 3.1.2, Surface Water and Circulation Patterns, prepared by The RETEC Group, Inc.

These comments were submitted previously by e-mail, but no acknowledgment was received so they are being resubmitted on paper in case the e-mail version was lost or mistakenly identified as spam.

This subsection was chosen for review because it doesn't appear to have been as carefully crafted as the rest of the RI/FS, although it contains an elaboration of a key operational assumption that informs and justifies the larger project. A statement of that assumption might be: 'We know enough about the dynamics of the bay to reliably predict where to look for the remains of Georgia Pacific's toxic waste, where it would be safe to leave some of it, how safe leaving it there would be, and how to monitor the security of what's left.'

**Sediment source.**

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Less reasonable than the sediment volume figure is the assertion on page 3-6 that "The residence time for water in Bellingham Bay is typically four to five days, but varies between one and eleven days." 5

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of water "exchange", not a discussion of particular water masses or of masses from a particular source, so it seems safe to assume that flushing time or something close to it is what RETEC had in mind.

We can approximate RETEC's derivation of the residence time figure by assuming that the bay is thoroughly mixed on a time scale much smaller than the residence time, and by assuming that water flows through the bay, not in and out of the bay. (Assume a river, not an estuary.)

The surface area of the semi-enclosed region between Samish Island and the Nooksack delta is 250,000,000 square meters; the volume of water is 5,650,000,000 cubic meters, in round figures (5). Using a tidal range of 3 meters, a tidal cycle of 24 2/3 hours, and Nooksack discharge of 9,680,000 cubic meters per tidal cycle derived from the USGS discharge figure above, we would have 3 X 250,000,000/24 2/3 = 30,400,000 cubic meters per hour moving through. It would take 5,650,000,000/(24 X 40,540,000) = 7.7 days to exchange the water in the bay at that rate, hence the "typically four to five days but varies between one and eleven days" assertion in the RI/FS, although the shorter times require more radical assumptions. A 4 meter tidal range would yield 5.8 days.

This may be a good estimate of water volumes surging back and forth past the southern end of
Lummi Island, but it is not a good estimate of water exchange in the bay, that is, of residual tidal #5-A
flow. The thoroughly mixed and through-flowing water assumptions are fatally unrealistic: the bay has strong vertical density stratification, and the tides flow in and out; residual tidal flow (over a cycle) is much smaller than instantaneous flow for most of the bay, approaching instantaneous flow rates only near the open boundaries.

The areas and volumes used above are taken from the model configuration for the work described in a poster at the June 4-9 2006 American Society of Limnology and Oceanography conference in Victoria. That poster described detailed computing and mapping of the flushing time of Bellingham Bay. Normal overall flushing time for the bay was determined to be 485 hours (20 days) with much longer times, an order of magnitude longer for a region of bottom waters in the northern part of the bay (5).

**Sediment accumulation.**

Using information in subsection 3.1.2 to estimate the sediment available for deposition, illustrates how that subsection is related to the larger remediation project. In that subsection we read that "there is a net southward flow throughout Bellingham Bay at depth, largely resulting from the lateral and vertical spreading of the Nooksack River discharge." We have read in 3.1.2 that the bay is an active water body with a residence time of a few days. 650,000 cubic meters of sediment is carried into that net southward flow. In such conditions sediments would be carried far and wide beyond the edge of the delta into the bay, sediments that would provide the natural capping of toxin containing sediments discussed in the RI/FS. (We also made the contrasting assumption that Georgia Pacific's waste settled near where it was dumped.)

How much capping we can expect? If we make the conservative assumptions that the accumulation 3
on the tide flats at the delta does not divert a significant part of the sediment load, and that all of the

sediment settles in the northern third of the bay, we can expect that 650,000 cubic meters of sediment will be spread over 250,000,000/3 square meters, which is 0.78 centimeters annual accumulation.

The empirical analysis in Section 6.2.1, Table 6-1 of the RI/FS indicates twice that rate of deposition in the inner harbor area, 1.6 centimeters per year. This discrepancy means that the estimate of the amount of sediment available is too low, or that Squalicum and Whatcom creeks supply significant sediment, or that sediment deposition is uneven and presently greater in the area of the inner harbor.

If sediment deposition is uneven, how confident can we be that circulation, and the related
depositional and erosional patterns will not change with land use changes and with climate change? A 2
1961 University of Washington master's thesis on Bellingham Bay sediments states that the growth
rate of the sediments over the last 70 years is 900,000 cubic yards (823,000 cubic meters) per year,
and that the growth of the delta in that period "is nearly as great as the total previously existing
delta"(6). That statement should warn us that present sedimentation rates in the bay are transitory.

The geography and dynamics of sediment transport in the bay are also transitory, far more transitory. 4
The largest Nooksack channel through the tide flats meanders along the northeastern shore, and
conveniently directs the heaviest sediment plume toward Boulevard Park. How rapidly will that
change; how soon will it meander elsewhere; how quickly will one of the meandering western tide
flat channels deepen and carry the heaviest load to the west side of the bay? In short, how securely
can we trust that some of the depositional environment we are counting on will not become
erosional?

**RI/FS improvement.**

If the role of the RI/FS is to provide a basis for public confidence that enough is known about how the bay works to plan for safe, comprehensive remediation of Georgia Pacific's toxic legacy, then it needs improvement. Below are three suggestions.

The RI/FS needs better overall consistency. Since sediment deposition is predicted and required, it 1
needs a sediment budget, a geographic sediment budget that accounts for delta growth and for
transport dynamics.

The RI/FS also needs a mercury budget in order for the public to gage how well mercury itself, and the other toxins in the inner bay sediments are encompassed by the RI/FS.

A final suggestion to improve Subsection 3.1.2 would be to edit all unsubstantiated assertions: everything submitted for public review should be substantiated by derivations or by field data with documentation of methods, or by references that lead to derivations or field data. Everything that is not substantiated should be clearly identified as public relations information not intended for review. Expecting the public to trust the undocumented assertions of consulting experts is contrary to democratic principles and not a proper function of public agencies.

(1) "The Nooksack River is also the primary source of sediments to the bay, with an annual discharge of 650,000 cubic meters." quoted from page 3-5 of the RI/FS.

(2) See http://wa.water.usgs.gov/realtime/adr/2000/data/12213100.2000.sw.pdf for USGS discharge data.

(3) "Collias et al. (1966), Shea et al. (1981), and Broad et al. (1984) have previously described the physical oceanography of Bellingham Bay. In addition, a recent study of inner Bellingham Bay currents was performed by Colyer (1998)." quoted from page 3-5 of the RI/FS.

(4) See Monsen, N.E., Cloern, J.E., Lucas, L.V., and Stephen G. Monismith, G., 2002. A comment on the use of flushing time, flushing time, and age as transport time scales. Limnol. and Oceanogr. 47: 1545-1553.

(5) Consistent and Accurate Calculation of Estuarine Flushing in Bellingham Bay Using an Ocean Circulation Numerical Model, Rubash, L, L, Kilanowski, E, M, http://www.sgmeet.com/aslo/victoria2006/.

(6) Richard W. Sternberg, 1962, Recent Sediments in Bellingham Bay, Washington, Master of science thesis, University of Washington, page 57.

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To: Department of Ecology

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DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

**From**: Bert Rubash
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**Date**: November 27, 2006

Questions and comments regarding the Supplemental Remedial Investigation & Feasibility Study, Volume 1: Appendix E, Data Used in the Development of the Site-Specific Mercury Bioaccumulation Screening Level

**Data Format**

Why was the statistical characterization of laboratory measurements from the lab reports--error estimates and threshold levels--not included in the data presented for public review?

Why was the public given digital PDF pictures of data tables rather than standard PDF files containing characters and numbers? Was it assumed that the public would not want to do anything with the tables other than look at them?

**Data Clusters**

The average of the internal sample deviations for the clusters for the crab data in Table 1 used in the regression is 0.0336, whereas the overall deviation for those 12 clusters is 0.0309. Judging by these measures of the scatter of the data, independence within clusters is greater than independence between clusters: why was the data in Table 1 clustered before performing the regression reported in Table 2?

It is true that another measure of independence for the whole data set, the adjusted R-squared of the regression for the clustered data, 0.7314, is significantly more than the value for the 23 individual points, 0.4273, but other selective clusterings could be found that would produce even better correlation; a clustering choice must be justified by other means than merely that it produces a desired result. That justification should be included in the Remedial Investigation. 14

(Comparing adjusted R-squared for the clam data is instructive; adjusted R-squared is *less* after clustering.)

A regression performed on the 23 data points for crab taken as individual data points would result in a 13% lower concentration for the sediment standard. Wouldn't performing regression on unclustered data have been more in keeping with the assertion that the methods used are consistently conservative?

(A CDROM containing the spreadsheet used for the above calculations along with the R-script used for the regressions accompanies these comments.)

**Regression Truth**

Why wasn't the variability of the regression procedure included in the calculation of the sediment
screening level? Fitting a line to a sample of sediment versus animal meat mercury concentrations is
a means of estimating the relationship between them, not a means of discovering the relationship
itself, which is a distribution, not an actual line. 95% point-wise confidence bounds for the 12-point 15
regression would indicate a sediment standard of 0.96 mg/kg rather than 1.2 mg/kg. (See attached
graph; confidence bounds are indicated by grey dashed lines.)

**Proportionality of Benefits** (in the Feasibility Study)

On page 220, Figure 7.1 of the Feasibility Study, "Medium Benefits" is 1/4 th of the distance
between "Low Benefits" and "High Benefits". How does the source of this ranking, the information 16
in Table 7-2 justify this proportionality?

***Comments on the Supplemental Remedial Investigation & Feasibility Study, Volume 1: RI Report, Part 3, Environmental Setting, Section 3.1, Physical Conditions, Subsection 3.1.2, Surface Water and Circulation Patterns, prepared by The RETEC Group, Inc.***

These comments were submitted previously by e-mail, but no acknowledgment was received so they are being resubmitted on paper in case the e-mail version was lost or mistakenly identified as spam.

This subsection was chosen for review because it doesn't appear to have been as carefully crafted as the rest of the RI/FS, although it contains an elaboration of a key operational assumption that informs and justifies the larger project. A statement of that assumption might be: 'We know enough about the dynamics of the bay to reliably predict where to look for the remains of Georgia Pacific's toxic waste, where it would be safe to leave some of it, how safe leaving it there would be, and how to monitor the security of what's left.'

Sediment source.

To make such an assumption we would need good estimates of the physical quantities involved. Unfortunately, one of the first quantities given, the annual discharge for the Nooksack River is ambiguous and unreferenced (1). The figure, 650,000 cubic meters of sediment discharge, is 5274 times smaller than the USGS figure for the mean water discharge for the years 1967-2000 at Ferndale: 3839 cfs (= 109 cubic meters/second => 3,430,000,000 cubic meters/year) (2). Combining the two discharges we have 1,000,000/5274 = 190 cubic centimeters of sediment in an average meter of Nooksack water. That's a little less than a cup, surprising, but reasonable. Was sediment volume measured, derived, guessed? We shouldn't have to wonder about its source, meaning, and validity. Are we be expected to search through the references listed at the start of the subsection (3) to find which document and which page contains the estimate and describes how the estimate was made?

Water exchange.

Less reasonable than the sediment volume figure is the assertion on page 3-6 that "The residence time for water in Bellingham Bay is typically four to five days, but varies between one and eleven days."

Studies of lakes and estuaries employ three measures of renewal, residence time, age, and flushing time (4).

Residence time, is the time elapsed from a water parcel's entry at a specified starting point until its departure. Age is the time elapsed since a parcel entered a water body, and the age of a water body is the average age of all water parcels. Flushing time, a more general measure, is the ratio of total volume (or mass) of water to its rate of renewal due to flow across boundaries. Flushing time is often also called residence time.

The context of RETEC's residence time assertion is a discussion of "oceanic" waters "entering" and of water "exchange", not a discussion of particular water masses or of masses from a particular source, so it seems safe to assume that flushing time or something close to it is what RETEC had in mind.

We can approximate RETEC's derivation of the residence time figure by assuming that the bay is thoroughly mixed on a time scale much smaller than the residence time, and by assuming that water flows through the bay, not in and out of the bay. (Assume a river, not an estuary.)

The surface area of the semi-enclosed region between Samish Island and the Nooksack delta is 250,000,000 square meters; the volume of water is 5,650,000,000 cubic meters, in round figures (5). Using a tidal range of 3 meters, a tidal cycle of 24 2/3 hours, and Nooksack discharge of 9,680,000 cubic meters per tidal cycle derived from the USGS discharge figure above, we would have 3 X 250,000,000/24 2/3 = 30,400,000 cubic meters per hour moving through. It would take 5,650,000,000/(24 X 40,540,000) = 7.7 days to exchange the water in the bay at that rate, hence the "typically four to five days but varies between one and eleven days" assertion in the RI/FS, although the shorter times require more radical assumptions. A 4 meter tidal range would yield 5.8 days.

This may be a good estimate of water volumes surging back and forth past the southern end of Lummi Island, but it is not a good estimate of water exchange in the bay, that is, of residual tidal flow. The thoroughly mixed and through-flowing water assumptions are fatally unrealistic: the bay has strong vertical density stratification, and the tides flow in and out; residual tidal flow (over a cycle) is much smaller than instantaneous flow for most of the bay, approaching instantaneous flow rates only near the open boundaries.

The areas and volumes used above are taken from the model configuration for the work described in a poster at the June 4-9 2006 American Society of Limnology and Oceanography conference in Victoria. That poster described detailed computing and mapping of the flushing time of Bellingham Bay. Normal overall flushing time for the bay was determined to be 485 hours (20 days) with much longer times, an order of magnitude longer for a region of bottom waters in the northern part of the bay (5).

Sediment accumulation.

Using information in subsection 3.1.2 to estimate the sediment available for deposition.illustrates how that subsection is related to the larger remediation project. In that subsection we read that "there is a net southward flow throughout Bellingham Bay at depth, largely resulting from the lateral and vertical spreading of the Nooksack River discharge." We have read in 3.1.2 that the bay is an active water body with a residence time of a few days. 650,000 cubic meters of sediment is carried into that net southward flow. In such conditions sediments would be carried far and wide beyond the edge of the delta into the bay, sediments that would provide the natural capping of toxin containing sediments discussed in the RI/FS. (We also made the contrasting assumption that Georgia Pacific's waste settled near where it was dumped.)

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The empirical analysis in Section 6.2.1, Table 6-1 of the RI/FS indicates twice that rate of deposition in the inner harbor area, 1.6 centimeters per year. This discrepancy means that the estimate of the amount of sediment available is too low, or that Squalicum and Whatcom creeks supply significant sediment, or that sediment deposition is uneven and presently greater in the area of the inner harbor.

Comments provided by Bert Rubash on CD-ROM to Ecology

Table 1 – Paired Sediment and Tissue Mercury Concentration Data, Bellingham Bay and Other Puget Sound Embayments (excluding Sinclair Inlet), 1990 to 1997

| Species/Tssue Type & Location | Measured Mercury Tissue Concentration in mg/kg wet wt. | Home Range Average Sediment Mercury Concentration in mg/kg dry wt. |
|---|---|---|
| Dungeness crab muscle: | | |
| Bellingham 18 | 0.081 | 0.10 |
| Bellingham 18 | 0.027 | 0.10 |
| Bellingham 18 | 0.031 | 0.10 |
| Chuckanut Bay | 0.060 | 0.12 |
| Lummi Penninsula | 0.090 | 0.20 |
| Post Point | 0.061 | 0.23 |
| Post Point | 0.077 | 0.23 |
| Central Bellingham Bay | 0.126 | 0.37 |
| Central Bellingham Bay | 0.056 | 0.37 |
| Post Point | 0.110 | 0.39 |
| Post Point Outfall | 0.080 | 0.39 |
| Georgia-Pacific Outfall | 0.120 | 0.51 |
| Georgia-Pacific Outfall | 0.060 | 0.51 |
| Whatcom Waterway | 0.100 | 0.54 |
| Whatcom Waterway | 0.119 | 0.54 |
| Whatcom Waterway | 0.211 | 0.54 |
| Whatcom Waterway | 0.204 | 0.54 |
| Whatcom Waterway | 0.100 | 0.54 |
| Whatcom Waterway | 0.108 | 0.54 |
| Padden Creek | 0.100 | 0.55 |
| Boulevard Park | 0.100 | 0.58 |
| Whatcom Waterway | 0.160 | 0.91 |
| Whatcom Waterway | 0.150 | 0.91 |
| Red Rock crab muscle: | | |
| Port Madison | 0.046 | 0.05 |
| Port Madison | 0.062 | 0.05 |
| Port Madison | 0.034 | 0.05 |
| Port Madison | 0.069 | 0.05 |
| Port Madison | 0.103 | 0.05 |
| Port Madison | 0.059 | 0.05 |
| Port Madison | 0.046 | 0.05 |
| Port Madison | 0.223 | 0.05 |
| Port Madison | 0.101 | 0.05 |
| Port Madison | 0.028 | 0.05 |
| Port Madison | 0.014 | 0.05 |
| Port Madison | 0.074 | 0.05 |
| Port Madison | 0.021 | 0.05 |
| West Eagle Harbor | 0.139 | 0.65 |
| West Eagle Harbor | 0.180 | 0.65 |
| West Eagle Harbor | 0.062 | 0.65 |
| West Eagle Harbor | 0.251 | 0.65 |
| West Eagle Harbor | 0.110 | 0.65 |
| West Eagle Harbor | 0.078 | 0.65 |
| West Eagle Harbor | 0.046 | 0.65 |
| West Eagle Harbor | 0.138 | 0.65 |
| West Eagle Harbor | 0.098 | 0.65 |
| West Eagle Harbor | 0.041 | 0.65 |
| West Eagle Harbor | 0.032 | 0.65 |
| West Eagle Harbor | 0.057 | 0.65 |
| West Eagle Harbor | 0.459 | 5.94 |
| English sole muscle: | | |
| Port Madison | 0.065 | 0.05 |
| Port Madison | 0.069 | 0.05 |
| Port Madison | 0.065 | 0.05 |
| Vendovi Island | 0.074 | 0.09 |
| Vendovi Island | 0.070 | 0.09 |
| Vendovi Island | 0.070 | 0.09 |
| Central Bellingham Bay | 0.091 | 0.37 |
| Central Bellingham Bay | 0.104 | 0.37 |
| Central Bellingham Bay | 0.094 | 0.37 |
| Central Bellingham Bay | 0.079 | 0.37 |
| Central Bellingham Bay | 0.090 | 0.37 |
| Central Bellingham Bay | 0.084 | 0.37 |
| Central Bellingham Bay | 0.086 | 0.37 |
| Central Bellingham Bay | 0.080 | 0.37 |
| Central Bellingham Bay | 0.076 | 0.37 |
| Duwamish River | 0.075 | 0.46 |
| Duwamish River | 0.079 | 0.46 |
| Duwamish River | 0.082 | 0.46 |
| Duwamish River | 0.056 | 0.46 |
| Duwamish River | 0.060 | 0.46 |
| Duwamish River | 0.065 | 0.46 |
| West Eagle Harbor | 0.119 | 0.65 |
| West Eagle Harbor | 0.129 | 0.65 |
| West Eagle Harbor | 0.142 | 0.65 |
| West Eagle Harbor | 0.124 | 0.65 |
| West Eagle Harbor | 0.109 | 0.65 |
| West Eagle Harbor | 0.115 | 0.65 |
| Elliot Bay Waterfront | 0.089 | 0.69 |

| | |
|---|---|
| slope | 0.1240290 |
| intercept | 0.0418641 |
| deviation from fit | |
| 0.026733 | |
| -0.027267 | |
| -0.023267 | |
| 0.003252 | |
| 0.023330 | |
| -0.009391 | |
| 0.006609 | |
| 0.038245 | |
| -0.031755 | |
| 0.019765 | |
| -0.010235 | |
| 0.014881 | |
| -0.045119 | |
| -0.008840 | |
| 0.010160 | |
| 0.102160 | |
| 0.095160 | |
| -0.008840 | |
| -0.000840 | |
| -0.010080 | |
| -0.013801 | |
| 0.005270 | stdev |
| -0.004730 | 0.035038 |

| | | | | |
|---|---|---|---|---|
| Elliot Bay Waterfront | 0.058 | 0.69 | | |
| Elliot Bay Waterfront | 0.062 | 0.69 | | |
| Elliot Bay Waterfront | 0.093 | 0.69 | | |
| Elliot Bay Waterfront | 0.080 | 0.69 | | |
| Elliot Bay Waterfront | 0.086 | 0.69 | | |
| Elliot Bay Waterfront | 0.092 | 0.69 | | |
| Elliot Bay Waterfront | 0.062 | 0.69 | | |
| Elliot Bay Waterfront | 0.063 | 0.69 | | |
| Elliot Bay Waterfront | 0.083 | 0.69 | | |
| Elliot Bay Waterfront | 0.080 | 0.69 | | |
| Elliot Bay Waterfront | 0.091 | 0.69 | | |
| Elliot Bay Waterfront | 0.088 | 0.69 | | |
| Elliot Bay Waterfront | 0.096 | 0.69 | | |
| Elliot Bay Waterfront | 0.089 | 0.69 | | |
| Elliot Bay Waterfront | 0.074 | 0.69 | | |
| Elliot Bay Waterfront | 0.067 | 0.69 | slope | 0.0066588 |
| Elliot Bay Waterfront | 0.067 | 0.69 | intercept | 0.0319573 |
| Composite hardshell clams: | | | deviation from fit | |
| Eagle Harbor | 0.011 | 0.03 | -0.021157 | |
| Eagle Harbor | 0.013 | 0.04 | -0.019224 | |
| Eagle Harbor | 0.064 | 0.05 | 0.031710 | |
| Eagle Harbor | 0.011 | 0.05 | -0.021290 | |
| Eagle Harbor | 0.020 | 0.05 | -0.012290 | |
| Eagle Harbor | 0.015 | 0.05 | -0.017290 | |
| Eagle Harbor | 0.016 | 0.05 | -0.016290 | |
| Eagle Harbor | 0.022 | 0.05 | -0.010290 | |
| Eagle Harbor | 0.025 | 0.05 | -0.007290 | |
| Eagle Harbor | 0.036 | 0.05 | 0.003710 | |
| Eagle Harbor | 0.069 | 0.05 | 0.036710 | |
| Eagle Harbor | 0.031 | 0.05 | -0.001290 | |
| Semiahmoo | 0.006 | 0.05 | -0.026290 | |
| Semiahmoo | 0.006 | 0.05 | -0.026290 | |
| Semiahmoo | 0.006 | 0.05 | -0.026290 | |
| Semiahmoo | 0.006 | 0.05 | -0.026290 | |
| Semiahmoo | 0.006 | 0.05 | -0.026290 | |
| Semiahmoo | 0.006 | 0.05 | -0.026290 | |
| Sequim Bay | 0.006 | 0.05 | -0.026290 | |
| Sequim Bay | 0.006 | 0.05 | -0.026290 | |
| Sequim Bay | 0.007 | 0.05 | -0.025290 | |
| Sequim Bay | 0.007 | 0.05 | -0.025290 | stdev |
| Sequim Bay | 0.006 | 0.05 | -0.026290 | 0.031179 |
| Eagle Harbor | 0.015 | 0.08 | -0.017490 | |
| Post Point | 0.019 | 0.39 | -0.015554 | |
| Post Point | 0.020 | 0.39 | -0.014554 | |
| Post Point | 0.020 | 0.39 | -0.014554 | |
| Boulevard Park | 0.010 | 0.58 | -0.025819 | |
| Eagle Harbor | 0.058 | 0.77 | 0.020915 | |
| Eagle Harbor | 0.056 | 0.77 | 0.018915 | |
| Eagle Harbor | 0.060 | 0.77 | 0.022915 | |
| Eagle Harbor | 0.081 | 0.77 | 0.043915 | |
| Eagle Harbor | 0.075 | 0.77 | 0.037915 | |
| Eagle Harbor | 0.074 | 0.77 | 0.036915 | |
| Eagle Harbor | 0.055 | 0.77 | 0.017915 | |
| Eagle Harbor | 0.159 | 1.30 | 0.118386 | |
| Eagle Harbor | 0.091 | 2.85 | 0.040065 | |
| Eagle Harbor | 0.091 | 12.44 | -0.023793 | |

| Bioaccumulation regression data | Number of Sample Composites | (y) y-intercept mg/kg wet | (s) slope dry/wet |
|---|---|---|---|
| Dungeness Crab | 12 | 0.047 | 0.116 |
| Red Rock Crab | 3 | 0.060 | 0.067 |
| English Sole | 15 | 0.070 | 0.028 |
| Clams and Mussels | 25 | 0.032 | 0.007 |

w/12 clustered crab data points

| | |
|---|---|
| 0.047 | 0.116 |

w/23 crab data points

| | |
|---|---|
| 0.042 | 0.139 |

| Tulalip Tribe seafood consumption (73 persons) | Consumption rate in kg/day Mean | UCL | 90%-tile |
|---|---|---|---|
| Dungeness Crab | 0.0120 | 0.0193 | 0.0234 |
| Red Rock Crab | 0.0001 | 0.0004 | 0.0000 |
| English Sole | 0.0023 | 0.0032 | 0.0078 |
| Clams and Mussels | 0.0144 | 0.0218 | 0.0385 |

Proportionality constants (Z) setting proportions of crab, fish, and shellfish in seafood diet.

| | | |
|---|---|---|
| 1.00 | 1.00 | 1.00 |
| 0.19 | 0.19 | 0.19 |
| 1.00 | 1.00 | 1.00 |

| Sediment Mercury Screening Levels Calculated for Different Consumption Scenarios | Sediment Screening Levels in mg/kg dry weight Mean | UCL | 90%-tile |
|---|---|---|---|
| 1. Crab consumption only | 4.61 | 2.71 | 2.17 |
| 2. Bottomfish consumption only | 107.20 | 76.34 | 29.84 |
| 3. Clam and Mussel consumption only | 67.81 | 43.18 | 22.40 |
| Total crab, bottomfish, and clams/mussels combined | | | |
| Using tissue-specific regression equations | 3.74 | 2.09 | 1.29 |
| Substituting Dungeness crab for bottomfish regression | 3.33 | 1.85 | 1.28 |

Oral reference dose for methyl-mercury 0.0070 mg/70kg/day (for a 70 kg person)

| sediment | muscle | stdev | |
|---|---|---|---|
| Dungeness | | | |
| 0.10 | 0.0463 | 0.030089 | 65% |
| 0.12 | 0.0600 | 0.035038 | 58% |
| 0.20 | 0.0900 | 0.035038 | 39% |
| 0.23 | 0.0690 | 0.011314 | 16% |
| 0.37 | 0.0910 | 0.049497 | 54% |
| 0.39 | 0.1100 | 0.035038 | 32% |
| 0.39 | 0.0800 | 0.035038 | 44% |
| 0.51 | 0.0900 | 0.042426 | 47% |
| 0.54 | 0.1403 | 0.052538 | 37% |
| 0.55 | 0.1000 | 0.035038 | 35% |
| 0.58 | 0.1000 | 0.035038 | 35% |
| 0.91 | 0.1550 | 0.007071 | 5% |
| Red Rock | | | |
| 0.05 | 0.0677 | 0.054268 | 80% |
| 0.65 | 0.1027 | 0.065354 | 64% |
| 5.94 | 0.4590 | 0.094832 | 21% |
| Sole | | | |
| 0.05 | 0.0663 | 0.002309 | 3% |
| 0.09 | 0.0713 | 0.002309 | 3% |
| 0.37 | 0.0963 | 0.006807 | 7% |
| 0.37 | 0.0843 | 0.005508 | 7% |
| 0.37 | 0.0807 | 0.005033 | 6% |
| 0.46 | 0.0787 | 0.003512 | 4% |
| 0.46 | 0.0603 | 0.004509 | 7% |
| 0.65 | 0.1300 | 0.011533 | 9% |
| 0.65 | 0.1160 | 0.007550 | 7% |
| 0.69 | 0.0697 | 0.016862 | 24% |
| 0.69 | 0.0863 | 0.006506 | 8% |
| 0.69 | 0.0723 | 0.017039 | 24% |
| 0.69 | 0.0847 | 0.005686 | 7% |
| 0.69 | 0.0910 | 0.004359 | 5% |
| 0.69 | 0.0693 | 0.004041 | 6% |
| Clams | | | |
| 0.03 | 0.0110 | 0.031179 | 283% |

Dungeness

weighted fit

| | | | |
|---|---|---|---|
| a | = 0.124029 | +/- 0.006785 | (5.471%) |
| b | = 0.0418641 | +/- 0.004871 | (11.64%) |

correlation matrix of the fit parameters:

| | a | b |
|---|---|---|
| a | 1.000 | |
| b | -0.894 | 1.000 |

unweighted fit

| | | | |
|---|---|---|---|
| a | = 0.11644 | +/- 0.02093 | (17.97%) |
| b | = 0.0468509 | +/- 0.009699 | (20.7%) |

correlation matrix of the fit parameters:

| | a | b |
|---|---|---|
| a | 1.000 | |
| b | -0.879 | 1.000 |

Sole

weighted fit

| | | | |
|---|---|---|---|
| a | = 0.0253225 | +/- 0.01089 | (43.01%) |
| b | = 0.0673326 | +/- 0.004499 | (6.682%) |

correlation matrix of the fit parameters:

| | a | b |
|---|---|---|
| a | 1.000 | |
| b | -0.782 | 1.000 |

unweighted fit

| | | | |
|---|---|---|---|
| a | = 0.0277407 | +/- 0.02235 | (80.58%) |
| b | = 0.0697395 | +/- 0.01231 | (17.64%) |

correlation matrix of the fit parameters:

| | a | b |
|---|---|---|
| a | 1.000 | |
| b | -0.922 | 1.000 |

Clams

weighted fit

| | | | |
|---|---|---|---|
| 0.04 | 0.0130 | 0.031179 | 240% |
| 0.05 | 0.0640 | 0.031179 | 49% |
| 0.05 | 0.0110 | 0.031179 | 283% |
| 0.05 | 0.0200 | 0.031179 | 156% |
| 0.05 | 0.0150 | 0.031179 | 208% |
| 0.05 | 0.0160 | 0.031179 | 195% |
| 0.05 | 0.0220 | 0.031179 | 142% |
| 0.05 | 0.0250 | 0.031179 | 125% |
| 0.05 | 0.0360 | 0.031179 | 87% |
| 0.05 | 0.0690 | 0.031179 | 45% |
| 0.05 | 0.0310 | 0.031179 | 101% |
| 0.05 | 0.0060 | 0.032565 | 543% |
| 0.05 | 0.0060 | 0.032565 | 543% |
| 0.05 | 0.0060 | 0.031850 | 531% |
| 0.05 | 0.0067 | 0.032565 | 488% |
| 0.08 | 0.0150 | 0.031179 | 208% |
| 0.39 | 0.0197 | 0.032565 | 166% |
| 0.58 | 0.0100 | 0.031179 | 312% |
| 0.77 | 0.0580 | 0.032565 | 56% |
| 0.77 | 0.0767 | 0.032565 | 42% |
| 0.77 | 0.0550 | 0.031179 | 57% |
| 1.30 | 0.1590 | 0.031179 | 20% |
| 2.85 | 0.0910 | 0.031179 | 34% |
| 12.44 | 0.0910 | 0.031179 | 34% |

| | | | |
|---|---|---|---|
| a | = 0.0066588 | +/- 0.002779 | (41.74%) |
| b | = 0.0319573 | +/- 0.007258 | (22.71%) |

correlation matrix of the fit parameters:

| | a | b |
|---|---|---|
| a | 1.000 | |
| b | -0.322 | 1.000 |

unweighted fit

| | | | |
|---|---|---|---|
| a | = 0.00670003 | +/- 0.002798 | (41.76%) |
| b | = 0.031771 | +/- 0.007228 | (22.75%) |

correlation matrix of the fit parameters:

| | a | b |
|---|---|---|
| a | 1.000 | |
| b | -0.321 | 1.000 |

Note: The estimates of sample variance above are based on the scatter of data points; laboratory estimates of variation were not available.

For 95% joint slope and intercept probability that a fit to a parent distribution would fall below an upper margin to the fit to a sample, the margin would be defined by a slope and intercept as follows:

The distribution of a sample mean is Gaussian, so we are looking for the integral of a joint, two tail probability of 90% (which gives us a single tail probability of 95% since we are only concerned with the upper bound). Individual 94.87% probability integrals would work. (sqrt(0.90))
The corresponding integration limits for Gaussian probability are -1.95 X stdev. and +1.95 X stdev.

Now let's revisit the statistical conclusions on page 6 of Appendix E

First is a recomputation of the results in the box containing the conclusions using slope and intercept from weighted fitting.

| Sediment Screening Levels | Sediment Screening Levels in mg/kg dry weight Mean | UCL | 90%-tile |
|---|---|---|---|
| 1. Crab only | 4.37 | 2.59 | 2.07 |
| 2. Bottomfish only | 117.53 | 83.73 | 32.78 |
| 3. Clam and Mussel only | 68.20 | 43.42 | 22.51 |
| | | | |
| Total combined | | | |
| tissue-specific | 3.58 | 2.02 | 1.27 |
| Substituting crab | 3.18 | 1.78 | **1.24** |

| (y) y-intercept mg/kg wet | (s) slope dry/wet |
|---|---|
| 0.042 | 0.124 |
| 0.060 | 0.067 |
| 0.067 | 0.025 |
| 0.032 | 0.007 |

With weighted fitting using sample variance, screening levels are lower for crab and higher for bottomfish and shellfish

Finally, let's account for the liklihood that our fitting of samples matches the underlying distributions of sediment and muscle concentrations.

z = 1.95

| Sediment Screening Levels | Sediment Screening Levels in mg/kg dry weight Mean | UCL | 90%-tile |
|---|---|---|---|
| 1. Crab only | 3.88 | 2.27 | 1.81 |
| 2. Bottomfish only | 63.73 | 45.35 | 17.64 |
| 3. Clam and Mussel only | 36.43 | 22.77 | 11.24 |
| | | | |
| Total combined | | | |
| tissue-specific | 2.88 | 1.55 | 0.85 |
| Substituting crab | 2.62 | 1.41 | **0.88** |

| (y) y-intercept mg/kg wet | (s) slope dry/wet |
|---|---|
| 0.051 | 0.137 |
| 0.060 | 0.067 |
| 0.076 | 0.047 |
| 0.046 | 0.012 |

| intercept sigma | slope sigma |
|---|---|
| 0.004871 | 0.006785 |
| | |
| 0.004499 | 0.010890 |
| 0.007258 | 0.002779 |

We see that accounting for variance in the fitting procedure results in significantly lower screening levels for sediment. Note that weighted fitting has much lower slope and intercept variances than unweighted fitting; i.e. accounting for variance in the fitting procedure used in Appendix E would result in even lower screening levels.

| sediment | crab | deviation |
|---|---|---|
| 0.1 | 0.0463 | 0.030089 |
| 0.12 | 0.06 | 0.035038 |
| 0.2 | 0.09 | 0.035038 |
| 0.23 | 0.069 | 0.011314 |
| 0.37 | 0.091 | 0.049497 |
| 0.39 | 0.11 | 0.035038 |
| 0.39 | 0.08 | 0.035038 |
| 0.51 | 0.09 | 0.042426 |
| 0.54 | 0.1403 | 0.052538 |
| 0.55 | 0.1 | 0.035038 |
| 0.58 | 0.1 | 0.035038 |
| 0.91 | 0.155 | 0.007071 |

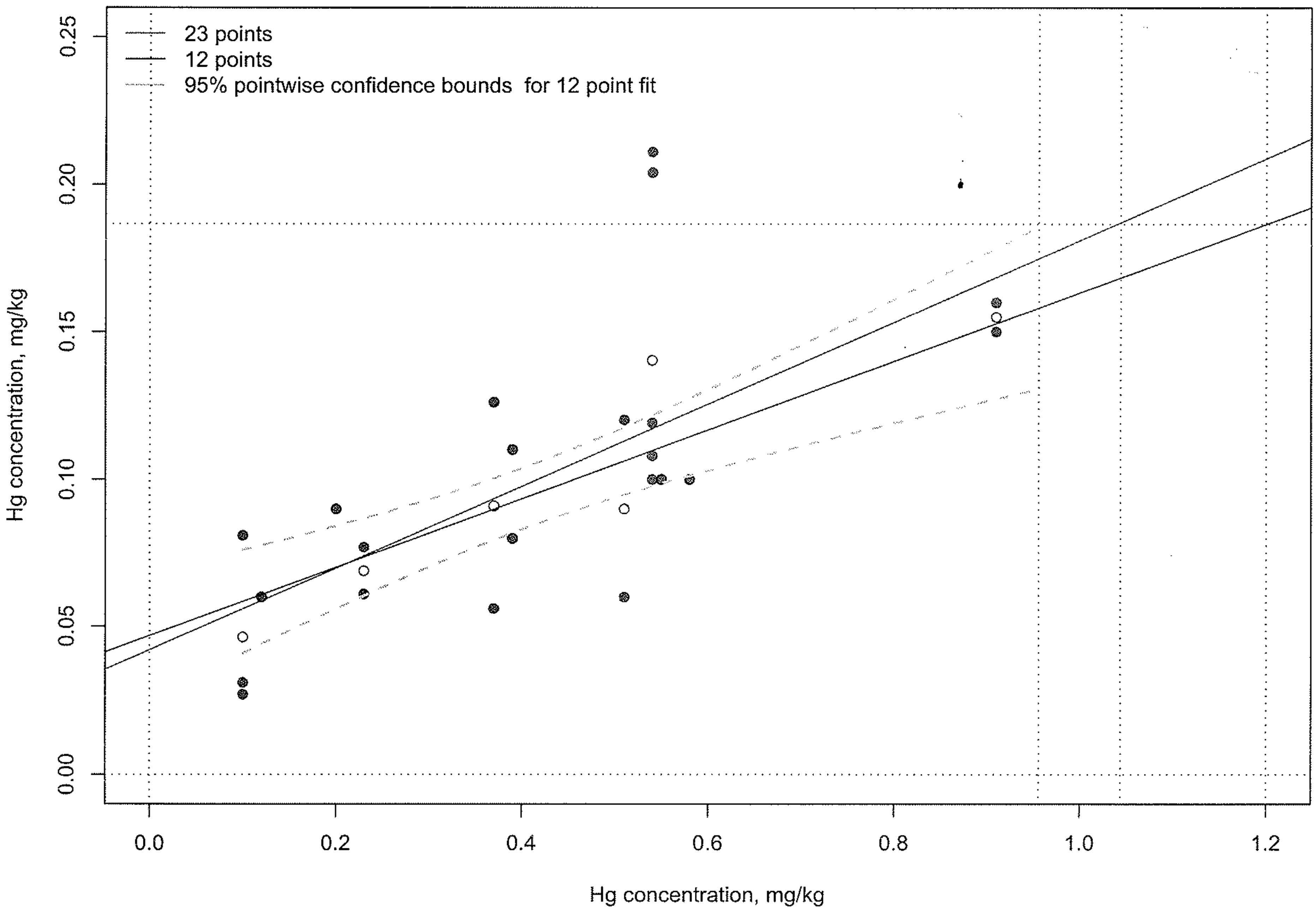
| sedim | ent crab | deviation |
|---|---|---|
| 0.1 | 0.081 | 0.026733 |
| 0.1 | 0.027 | -0.027267 |
| 0.1 | 0.031 | -0.023267 |
| 0.12 | 0.06 | 0.003252 |
| 0.2 | 0.09 | 0.02333 |
| 0.23 | 0.061 | -0.009391 |
| 0.23 | 0.077 | 0.006609 |
| 0.37 | 0.126 | 0.038245 |
| 0.37 | 0.056 | -0.031755 |
| 0.39 | 0.11 | 0.019765 |
| 0.39 | 0.08 | -0.010235 |
| 0.51 | 0.12 | 0.014881 |
| 0.51 | 0.06 | -0.045119 |
| 0.54 | 0.1 | -0.00884 |
| 0.54 | 0.119 | 0.01016 |
| 0.54 | 0.211 | 0.10216 |
| 0.54 | 0.204 | 0.09516 |
| 0.54 | 0.1 | -0.00884 |
| 0.54 | 0.108 | -0.00084 |
| 0.55 | 0.1 | -0.01008 |
| 0.58 | 0.1 | -0.013801 |
| 0.91 | 0.16 | 0.00527 |
| 0.91 | 0.15 | -0.00473 |

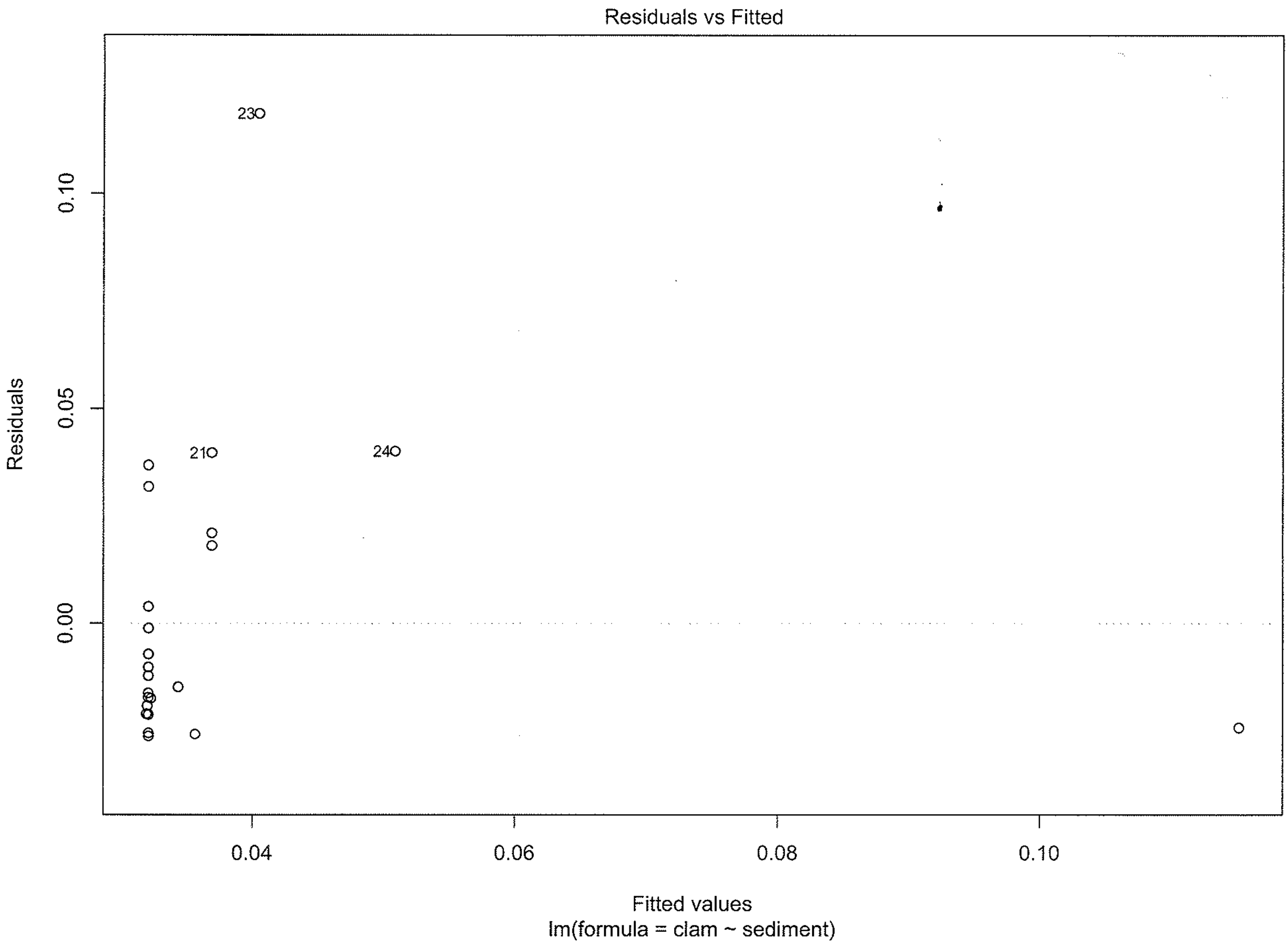
| sediment | clam |
|---|---|
| 0.03 | 0.011 |
| 0.04 | 0.013 |
| 0.05 | 0.064 |
| 0.05 | 0.011 |
| 0.05 | 0.02 |
| 0.05 | 0.015 |
| 0.05 | 0.016 |
| 0.05 | 0.022 |
| 0.05 | 0.025 |
| 0.05 | 0.036 |
| 0.05 | 0.069 |
| 0.05 | 0.031 |
| 0.05 | 0.006 |
| 0.05 | 0.006 |
| 0.05 | 0.006 |
| 0.05 | 0.006 |
| 0.05 | 0.006 |
| 0.05 | 0.006 |
| 0.05 | 0.006 |
| 0.05 | 0.006 |
| 0.05 | 0.007 |
| 0.05 | 0.007 |
| 0.05 | 0.006 |
| 0.08 | 0.015 |
| 0.39 | 0.019 |
| 0.39 | 0.02 |
| 0.39 | 0.02 |
| 0.58 | 0.01 |
| 0.77 | 0.058 |
| 0.77 | 0.056 |
| 0.77 | 0.06 |
| 0.77 | 0.081 |
| 0.77 | 0.075 |
| 0.77 | 0.074 |
| 0.77 | 0.055 |
| 1.3 | 0.159 |
| 2.85 | 0.091 |
| 12.44 | 0.091 |

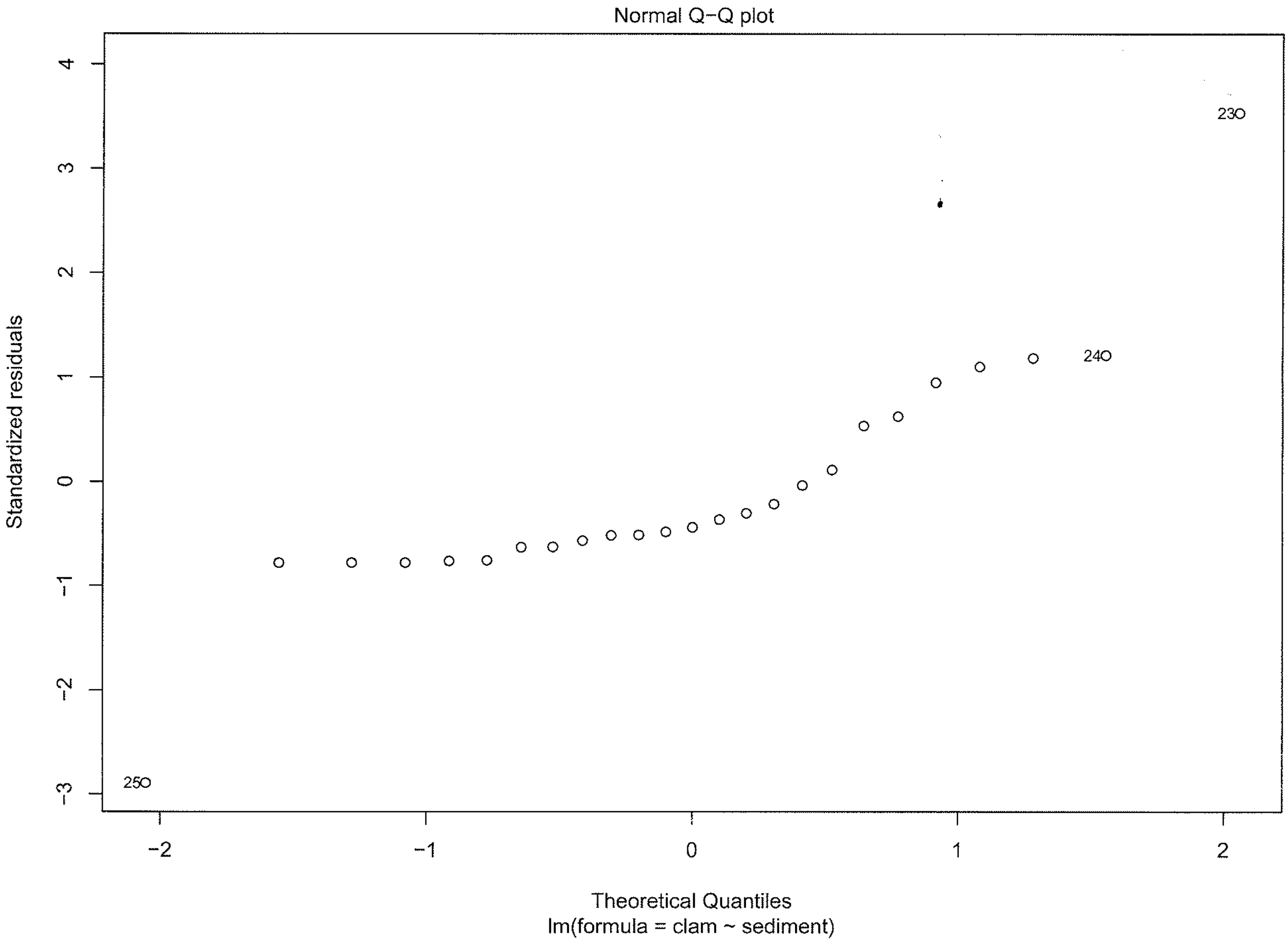
| sediment | clam | deviation |
|---|---|---|
| 0.03 | 0.011 | 0.031174 |
| 0.04 | 0.013 | 0.031174 |
| 0.05 | 0.064 | 0.031174 |
| 0.05 | 0.011 | 0.031174 |
| 0.05 | 0.02 | 0.031174 |
| 0.05 | 0.015 | 0.031174 |
| 0.05 | 0.016 | 0.031174 |
| 0.05 | 0.022 | 0.031174 |
| 0.05 | 0.025 | 0.031174 |
| 0.05 | 0.036 | 0.031174 |
| 0.05 | 0.069 | 0.031174 |
| 0.05 | 0.031 | 0.031174 |
| 0.05 | 0.006 | 0.03256 |
| 0.05 | 0.006 | 0.03256 |
| 0.05 | 0.006 | 0.031845 |
| 0.05 | 0.0067 | 0.03256 |
| 0.08 | 0.015 | 0.031174 |
| 0.39 | 0.0197 | 0.03256 |
| 0.58 | 0.01 | 0.031174 |
| 0.77 | 0.058 | 0.03256 |
| 0.77 | 0.0767 | 0.03256 |
| 0.77 | 0.055 | 0.031174 |
| 1.3 | 0.159 | 0.031174 |
| 2.85 | 0.091 | 0.031174 |
| 12.44 | 0.091 | 0.031174 |

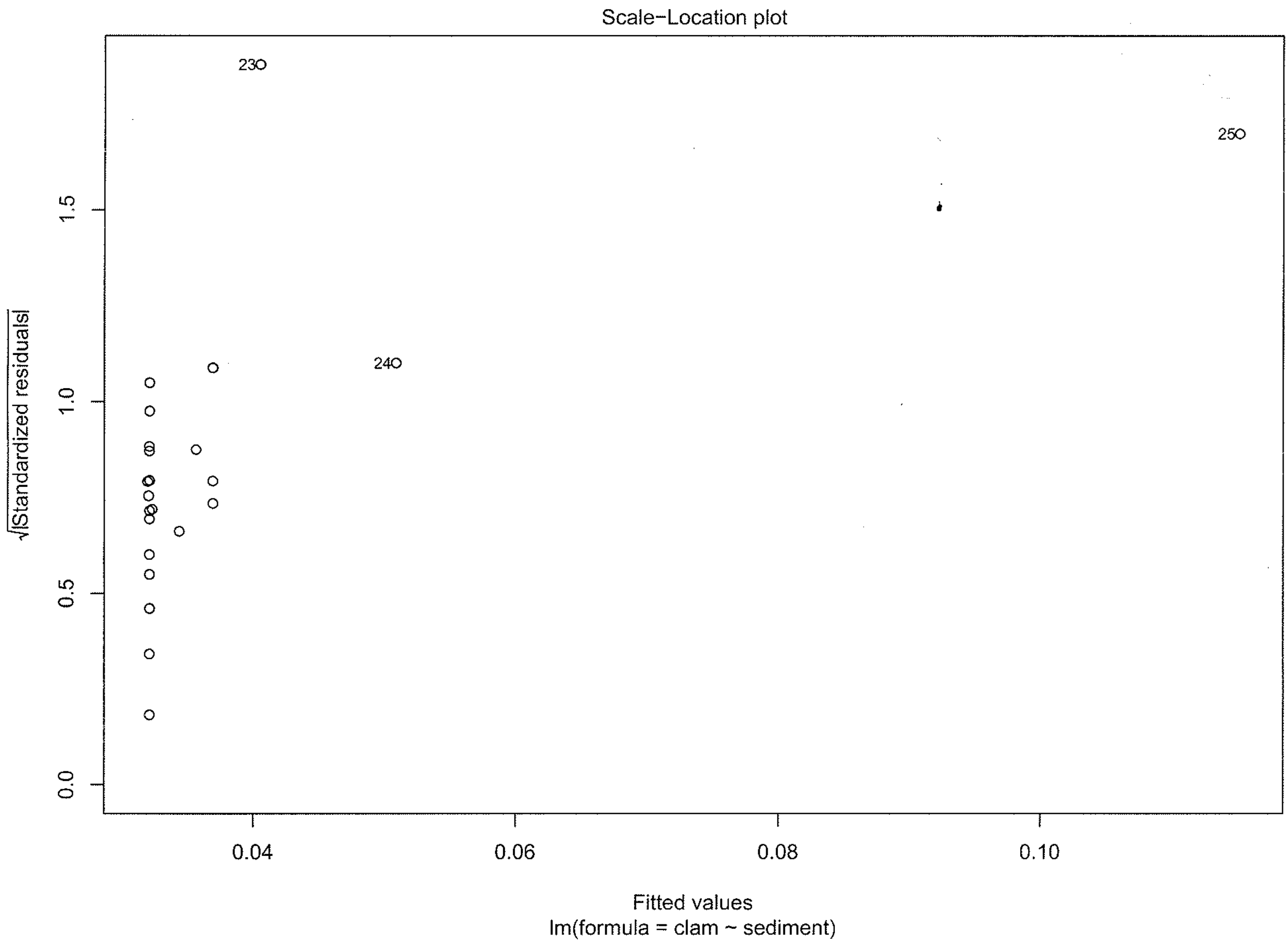
#7-B

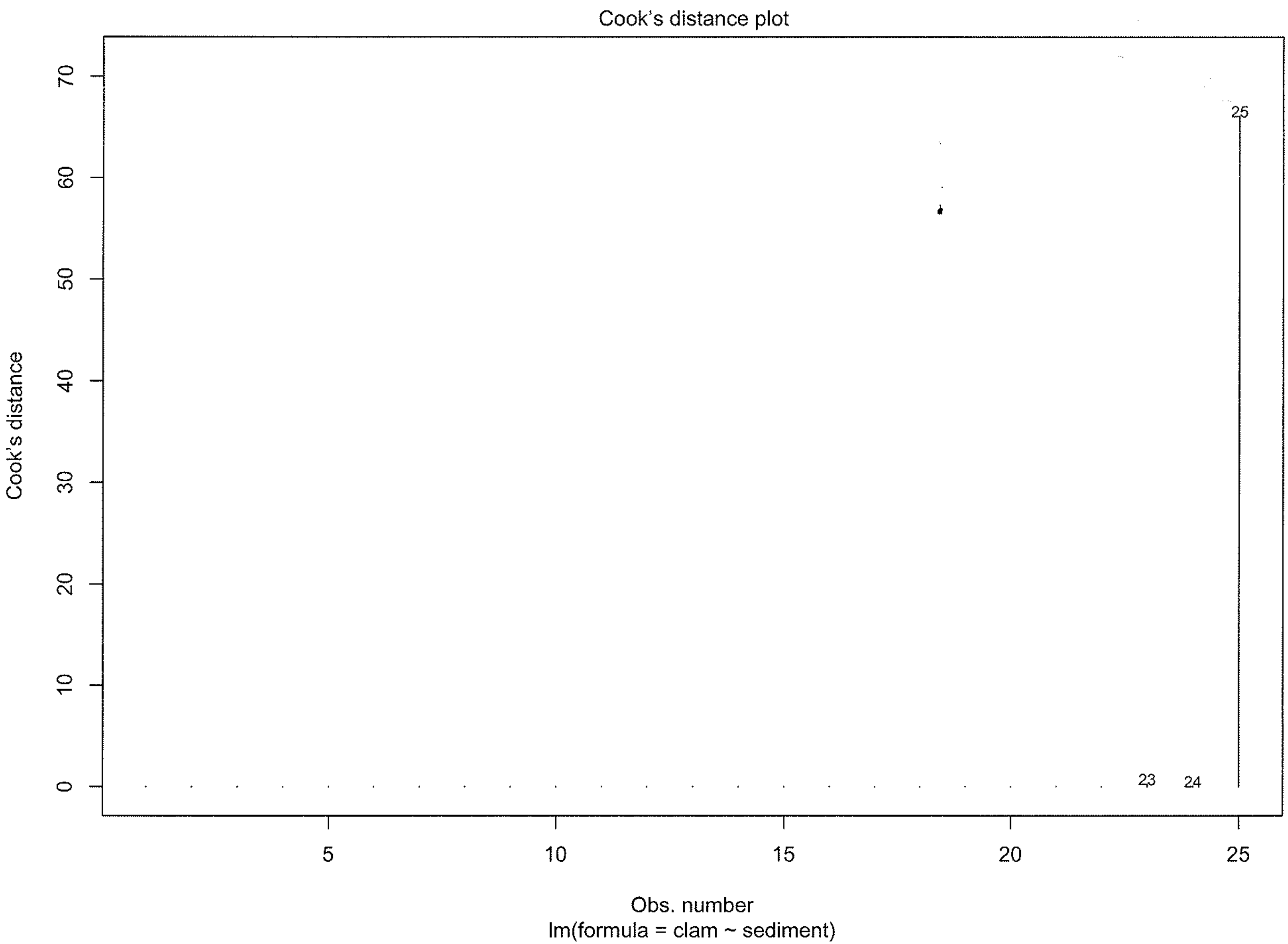
# Sediment -> Crab




Residuals vs Fitted
Residuals
0.10
0.05
0.00
23
21
24
0.04
0.06
0.08
0.10
Fitted values
lm(formula = clam ~ sediment)


Normal Q−Q plot
Standardized residuals
Theoretical Quantiles
lm(formula = clam ~ sediment)
23
24
25
4
3
2
1
0
−1
−2
−3
−2
−1
0
1
2


Scale−Location plot
23
24
25
1.5
1.0
0.5
0.0
√|Standardized residuals|
0.04
0.06
0.08
0.10
Fitted values
lm(formula = clam ~ sediment)



Cook's distance plot
Cook's distance
0
10
20
30
40
50
60
70
5
10
15
20
25
23
24
25
Obs. number
lm(formula = clam ~ sediment)

Commenter No. | Name / Organization
130 | Seestrom, Jon

Commenter Submittals:
A E-mail dated Dec. 15, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Marina comments | Support for development of new marina | 6.8 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

#1-A

**From:** Jon Seestrom [mailto:Jon.Seestrom@wecu.com]
**Sent:** Friday, December 15, 2006 2:27 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms McInerney,
I have been sailing in Bellingham Bay since 1994. I believe our water is coming back to life and feel that the expansion of our marina will improve the quality of life for Whatcom county residents. I do not own a large boat, on the contrary I spend most of my time in small trailer able boats but I feel the amenities that come along with having a first 1
class environmentally friendly marina will be a nice addition to our community. I reviewed the draft RI/FS and EIS documents for the Whatcom Waterway Site. I prefer alternatives 5 and 6 for the future of boating and water access for Whatcom county 2
residents. Thanks for receiving my comments and for helping to ensure our waterfront is environmentally safe.
Sincerely,
Jon Seestrom

| Commenter No. | Name / Organization |
|---|---|
| 131 | Servais, John |

Commenter Submittals:

| | |
|---|---|
| A | Public hearing transcript excerpt |
| B | Public hearing exhibit |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | RI | Additional investigations | Need for additional data for hot spot definition | 4.10 |
| 2 | RI | Radioactive materials | Concerns about potential radioactivity at site | 4.16 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | RI | Additional investigations | Need for additional data for hot spot definition | 4.10 |
| 5 | RI | Radioactive materials | Concerns about potential radioactivity at site | 4.16 |
| 6 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**John Servais**
I'm John Servais. I've got something that I'm going to read. It's going to take about 3 minutes or a little bit more.

I live down here in Happy Valley near Fairhaven. I have for many years. I first came to Bellingham from the Midwest 1967. I just want to say a couple things about my own involvement and the reason is because it's been so long. I'm so pleased to be at a public hearing which is on the record; it's a legal process with regards to our mercury pollution of Whatcom Waterway.

I've been involved with the issue of Whatcom Waterway contamination with mercury and other toxins since 1970 when I was on the Northwest Passage underground newspaper. My concerns were expressed in attempts to alert our community to the dangers of 1970's and 1980's. In the 1990's Georgia Pacific actually asked me to host a one day meeting with several of its top plant managers including the manager of the mercury plant or the chlorine plant. To answer their questions and try to explain why some of us citizens were so critical of GP. I did that. It was an interesting day.

A couple of years later Georgia Pacific invited me to join a citizen advisory group they formed to help them understand community concerns about the pulp and chlorine plants. I served on that committee for several years, quietly without mentioning it in public because it wouldn't have been appropriate. Not until it disbanded in about 2000.

Of the 15 or so people on that advisory group I was the only environmentalist and enjoyed many scathing comments about enviros from the other members. I was once referred to as representing the enemy. Department of Ecology was a friend.

I appreciate the chance to finally go on the record on this issue at a public hearing not a public meeting. My comments are very critical of the Department of Ecology, the Port of Bellingham, and the City of Bellingham.

As early as 1995 the Bellingham Bay Pilot project and I may have the year off by one year. Maybe it was 1996. Even then run by Lucy Pebles...Lucy McInerney was avoiding any factual and honest process as regards to the amounts of mercury in the Whatcom Waterway. I was critical then to Lucy. No tests were being taken, no core samples-- I wish I was the facing the audience but that's ok. No tests were being taken were the mercury was probably the most intense. The same can be said today in 2006. After 11 years of meetings the DOE is still hiding the truth. 1

I started this whole process of being concerned about the mercury contamination out here when I was in my 20's. Now I'm 65 years old and I'm on Social Security and I'm still concerned and we haven't made any progress. It's time that our government agencies start to work for our interests and not the industrial interests.

So simply put I have five points. Number 1 DOE has enabled Georgia Pacific to pollute our waterway and our air with mercury for over 30 years. DOE has enabled it. DOE has monitored our poisoning and has hidden the facts and the truth from us. Now DOE is pretending to try and learn what has happened. They need only look at their own records of over 30 years. The Bellingham DOE offices continue to hide its records from us citizens too.

No core samples have been taken that I have seen and I have looked carefully through the maps have been taken from the most likely hot spots in the Whatcom Water where the mercury is probably the most intense. This is a conscience effort on DOE, the Port and the City to hide the truth from us citizens.

We have a toxic waterfront, one that is probably causing us illnesses and killing us. There is evidence of radioactive sludge dumping with knowledge by DOE on the waterfront and in our 2
county.

We may have a major toxic dump that is comparable to the worst in the United States right in our community. The low levels shown in the clean up proposals are deceptive deceptions by the Department of Ecology.

Three, the only acceptable solution is removal of these toxins from our waterfront. I've studied for many hours the reports that were made public when Georgia Pacific sold the land to the Port of Bellingham a couple of years ago.

With the pretend clean up and the capping procedures posed by the Port and DOE our waterfront will remain a dangerous place for people.

**Moderator**
Sir you have about a minute left.

**John Servais**
Thank you. We are being lied to by our government agencies. As a citizen I can only request to Governor Gregoire require DOE to make a complete study of the pollution of our waterfront, including area 3B that George referred to that you kind of ignored. A complete study of our complete waterfront in the Whatcom Waterway and present this honest and full report all of us citizens. The health and safety of our community and people require this.

Five, I know that report will tons of tons of mercury in our waterfront. I request...I demand that DOE require all toxins, all mercury to be removed from our waterfront and from Bellingham Bay and be deposited in a secure landfill far away from people.

You know, obviously I reject capping. It's unproven, it's unstable, it's a confusing thing. 1
Obviously it's proposal number 8. Take it all away.

One last thing if I have a few seconds. In the terms of that dredging up a little bit for the main dock person, freight and what not. I was on the Port's dock committee a few years ago. If you do any dredging those docks are going to try to fall over into the waterway. To repair those docks you would have to drive pilings. To drive pilings you would disturb the mercury. So no way. Thank you.

Washington Dept. Of Ecology hearing on Whatcom Waterway cleanup - Dec 11, 2006 2

Statement of John Servais, 1609 Mill Ave , Bellingham 98225 - www.nwcitizen.us

This is the statement I read at the public hearing. I am submitting it also as a written comment

I have been involved with the issue of the Whatcom Waterway contamination with mercury and other toxins since 1970 when I was on the Northwest Passage underground newspaper. My concerns were expressed in attempts to alert our community to the dangers in the 1970s and 1980s. In the 1990s, Georgia Pacific asked me to host a one day meeting of several of its top plant managers to answer their questions and explain why some of us citizens were so critical of GP. I did so. A couple years later, GP invited me to join a citizen advisory group they formed to help them understand community concerns about their pulp and chlorine plants. I served on it for several years until it was disbanded about 2000. Of the 15 or so people on the advisory group, I was the only environmentalist and enjoyed many scathing comments about enviros from the other members. I was once referred to as representing the "enemy". DOE was a friend.

I appreciate the chance to finally go on the record on this issue at a public hearing. My comments are very critical of the Dept of Ecology, the Port of Bellingham and the City of Bellingham. As early as 1995, the Bellingham Bay Pilot Project, run even then 11 years ago by Lucy McInerney, was avoiding any factual or honest process as regards mercury in the Whatcom Waterway. I was critical then to Lucy that no tests were being taken where the mercury was probably the most intense. The same can be said today in 2006.
After 11 years of meetings, the DOE is still hiding the truth. I started this in my 20s. I'm now 65 and on Social Security. It is time our Department of Ecology worked in our interests - the interests of residents. 3

So, simply put, 5 points:

1. DOE has enabled Georgia Pacific to pollute our waterway and our air with mercury for over 30 years. The DOE has monitored our poisoning and has hidden the facts and truth from us. Now DOE is is pretending to try and learn what has happened. The need only look at their own records of over 30 years. The Bellingham DOE office continues to hide its records from citizens.

2. No core samples have been taken from the most likely hot spots in the Whatcom Waterway where the mercury is probably the most intense. This is a conscious effort by DOE, the Port and the City to hide the truth from us citizens. We have a toxic waterfront - one that is probably causing us illnesses and killing us. #4-B
There is evidence of radioactive sludge dumping with knowledge by DOE on the waterfront and in our county. We have a major toxic dump that is comparable to the worst in the United States. The low levels shown in the Cleanup proposal are deceptions by DOE.

3. The only acceptable solution is removal of these toxins from our waterfront. I've studied for many hours the reports made public when GP sold the land to the Port of Bellingham. With the pretend clean up and 4
capping procedures proposed by the Port and DOE, our waterfront will remain a dangerous place for people. We are being lied to by our government agencies.

4 As a citizen, I can only request that Governor Gregoire require DOE to make a complete study of the pollution of our waterfront and the Whatcom Waterway and present this honest and full report to all of us citizens. The health and safety of our community and people requires this.

5. As I know that report would show tens of tons of mercury in our waterfront, I request - I demand - that DOE require all toxins - all mercury - to be removed from our waterfront and from our Bellingham Bay and be deposited in a secure landfill far away from people. - thank you.

Commenter No. Name / Organization
132 Shapiro, Alex

Commenter Submittals:
A E-mail dated Dec 9, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Alex Shapiro [mailto:akira@niftywerks.com]
**Sent:** Saturday, December 09, 2006 3:40 PM
**To:** McInerney, Lucy (ECY)
**Subject:**

hello, I am writing to demand as a whatcom county resident, that the dept of ecology mandate the full and entire cleanup of the bellingham bay and whatcom waterway. 1
Please don't let the ports bad decision to adopt the liability allow the continued endangerment and exposure of all of us, including the wildlife, to the industrial pollution recklessly discarded by past generations.
thank you

Alex Shapiro
5930 Bell Creek rd/ box 86
Maple Falls, WA 98266
360-592-1387

Commenter No. | Name / Organization

133 Shaughnessy, Jon

Commenter Submittals:

A E-mail dated Dec. 17, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Cleanup levels | Potential future changes to cleanup levels | 5.30 |
| 2 | FS | Seismic stability | Earthquake disturbances to sediment caps | 5.7 |
| 3 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 4 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Jon Shaughnessy [mailto:janejon@comcast.net]
**Sent:** Sunday, December 17, 2006 7:06 AM
**To:** McInerney, Lucy (ECY)
**Cc:** Bellingham Bay Foundation; Whatcom Independent; KVOS TV; KBCB-TV; Cascadia Weekly; Bellingham Herald; Lamphiear, Bryn
**Subject:** Mercury cleanup of our bellingham Bay

Dear Lucy,

I'm sorry I didn't get a chance to write this to you sooner, but we were busy moving into our new home in Bellingham, where we can't see the old GP site like we used to from our condo window, but we still visit our dear Bay every day and we care about its health as well as the health of every living thing that will enjoy it in the future.

I missed seeing you at the hearing because I also missed the hearing, so I hope this e-mail will suffice (and will get to you in time, so please acknowledge receipt):

- While it is true that dredging contaminated sediments does pose some risk of re-exposure, this short-term risk is far outweighed by the benefits inherent in permanently removing more mercury from our natural environment. Sediment standards change; zoning and land use proposals change, but mercury is forever. The best way to ensure public confidence in the long-term protectiveness of the cleanup is to remove mercury, not bury it. We don't want to have to do this again! 1
- You've probably hear that before, but that's not why I'm writing this to you.
- I lived on the edge of another bay, Santa Monica Bay, which I also loved, so much that I helped start a group, Heal the Bay, that had a lot of work to do when it formed in 1985 and its work isn't finished yet and the problems were diverse, but one "little" problem there stands out in my memory and I hope your Dept. has already considered this analogy in such great detail that I need not keep writing.

But I will, just in case this tiny detail may have escaped anyone's notice; just in case this minor problem proves to be the grain of sand that brings a well-lubricated machine to a grinding halt.

For a very long time in the distant past a large firm named Montrose manufactured DDT and they were permitted, back in those innocent days, to dump their waste products in a controlled area far enough from the beach off White point and deep enough in the Pacific waters to be "safe" according to the best data available in the 1950's. So a very large mass of DDT and worse was, innocently enough, built on the floor of that bay.

No, there was no mercury involved, nor was it in shallow waters of a busy port that hopes to get busier.

So dumping more dirt on top of it and capping it until the DDT would decompose and stop slowly killing the infants of the people so poor they caught and ate the fish in that polluted Bay made sense, compared to trying to dredge it up and haul it away.

Even though that bay and this bay share a proximity to so many active earthquake faults we knew there was a risk of disturbance over the next few centuries. 2

But mercury is an element, not a compound, and it has the potential to kill and maim forever, so a "solution" for this century isn't good enough. We have to pay for our past collective mistakes, but with cold hard cash, not some infant's life a thousand years from now.

I love to sail. I hope to sail out of that marina some day. But I have three healthy daughters and two healthy grandchildren and a thousand years from now no one needs to die because you and I wanted to keep costs down. 1

You and I don't know what our Bay will look like a thousand years from now, but we do know a few things about the next thousand years and we can not move forward on this question of how to clean up our past without acknowledging our moral obligation to the future:

1. The mercury will still be mercury.
2. There will be seismic activity.
3. There will be human activity involving commerce, recreation, and water (at least as long as there is water in what we now call the Bay).
4. Accidents will happen.
5. State, national, and local governments may come and go, along with taxing authorities and environmental enforcement agencies and laws.

And a thousand years from now, if there is still water in our Bay and there are still people living on its edge our decisions this new year about our old mercury deposits may be slowly killing the infants of those people whenever they catch and eat the fish in that Bay.

So we better dredge it up and haul it away. 2

Please let me know if you have any questions concerning any of the above, and please do let me know how you plan to use this information and reach a sound decision.

Thank you for your time and concern for our future.

Sincerely,
Jon Shaughnessy
930 Mason St.
Bellingham, WA 98225
360/671-0248
janejon@comcast.net

CC: BBF, media
BCC: concerned citizens who should also write to Lucy McInerney at the Department of Ecology:lpeb461@ecy.wa.gov
before it's too late after Monday, 12/18/06

| Commenter No. | Name / Organization |
|---|---|
| 134 | Shaw, Deborah |

Commenter Submittals:

A E-mail dated Nov. 15, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

**From:** Deborah Shaw [mailto:shaw.deborah@comcast.net]
**Sent:** Friday, December 15, 2006 3:33 PM
**To:** McInerney, Lucy (ECY); McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms. McInerney,

I am a Whatcom County resident and boat owner that uses and enjoys Bellingham Bay.

I have read the draft RI/FS and EIS documents for the Whatcom Waterway Site, and I want you to know that I support the preferred alternatives 5 and 6 as they are currently written. 1

Thank you for your time and commitment to the future of the waterfront.

Sincerely,
Deborah Shaw

Commenter No. Name / Organization
135 Shellenberger, Matthew

Commenter Submittals:
A E-mail dated Dec. 15, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Matthew [mailto:donmatthew@yahoo.com]
**Sent:** Friday, December 15, 2006 6:04 AM
**To:** McInerney, Lucy (ECY)
**Subject:** Support Bellingham Families

Matthew Shellenberger
All Craft Construction, LLC
1201 Dupont Street
Bellingham , WA 98225

December 14, 2006

Lucy McInerney

DOE

lpeb461@ecy.wa.gov

Dear Lucy:

I am writing to ask you to support Alternative 7, full cleanup of the Bellingham Bay . For the past few years I have been following the cleanup process of the GP site and bay. I am confused how GP was allowed to release so much toxic pollution in the first place. Where was DOE oversight when the toxins were being released? 1

I am sure GP oversight was not your fault and I do not expect an answer. However I would greatly appreciate DOE backing of Alternative 7. It is the only alternative that makes the Port happy and protects the people and wildlife from ongoing contamination issues.

I think that this is an important decision. It will benefit the community at large by providing a safer place to live and raise a family. Alternative 7 will be a model project for the world.

Thank you for your support.

Sincerely,

Matthew Shellenberger

Commenter No. Name / Organization
136 Short, Michael

Commenter Submittals:
A E-mail dated Dec. 16, 2006

| Comment | Summary of Comment | | | Ecology Response |
|---|---|---|---|---|
| Number | Doc. | General Topic | Specific Topic | (RS Section) |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Capping effectiveness | Concerns over long-term effectiveness | 5.2 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: M & L Short/Rotecki [mailto:shotecki@openaccess.org]
Sent: Saturday, December 16, 2006 11:08 AM
To: McInerney, Lucy (ECY)
Subject: Bellingham Bay mercury clean up

Lucille T. McInerney, P.E., Site Manager Department of Ecology, Northwest Regional Office

Dear Site Manager,

I would like to express my concern of leaving substantial amounts of mercury in sediments of Bellingham Bay around the former Geogia Pacific properties. The only acceptable solution for the best recovery of this valuable community resource is commitment to remove as much mercury as possible. 1

Mitigating the high levels of mercury by capping can only be a temporary

solution. It will need to be dealt with again, likely at a more complicated and higher cost to the environment and in community health. Remediation later will also cause significant disruption to what ever infrastructure is in place at the time. There will probably 2
have been years of increased toxic risk from the failed cap before final

clean up might occur.

In my opinion, whatever it takes mow is the solution. We can pay now or

pay later. I'd rather this community not pay later which will include poor health outcomes which add to the cost as well as the incredulity of

future generations for the legacy they were handed.

Michael Short, RN
Public Health Nurse
Bellingham WA

Commenter No. 137 — Name / Organization: Smith, Gerald

Commenter Submittals:

A Letter dated Dec. 16, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Preference not stated or not clear | 5.1 & Table 5-2 |
| 2 | FS | Project funding | Favors additional taxes for cleanup funding | 5.26 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

16 December 2006

Jerry Smith
2914 Coolidge Dr.
Bellingham, WA 98225

Ms. Lucille T. McInerney
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Dear Ms. McInerney,

This refers to the pending decision to be made on how to deal with the toxic materials in the land, shore and water at the former Georgia-Pacific property, and surrounding area, in Bellingham.

I urge that the cleanup be as thorough and extensive as it can be. We should look far into the future when making this decision and consider not only public safety, but the wishes and well-being of the people who will follow us. 1

Good sense requires us to do the job right, and proceed so that future options remain as unrestricted as possible. I will vote to increase my taxes for this if necessary. 2

Sincerely,

Gerald P. Smith

Gerald P. Smith

Commenter No. | Name / Organization

| Commenter No. | Name / Organization |
|---|---|
| 138 | Spencer, Julia |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 15, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

**From:** Julia Spencer [mailto:juliafspencer@gmail.com]
**Sent:** Friday, December 15, 2006 1:14 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham Bay Cleanup

Dear Lucille McInerney,

I would like to advocate for the total cleanup of toxic contaminants in the Bellingham Bay waterfront at the former GP mill site. I have followed the issue closely and weighed both the environmental and economic factors involved. The only good solution is total cleanup and removal of contaminants to a certified upland toxic materials depository. The toxic contaminants must be cleaned up to the maximum standards possible and that will drive a robust future economy at the redeveloped site. The environmental and economic benefits of full waste removal and disposal are what the residents and taxpayers deserve from a cleanup and redevelopment plan for publicly owned land. 1

Thank you for considering my comments.

Sincerely,
Julia Spencer
2539 James St
Bellingham WA 98225

Commenter No. Name / Organization
139 Streib, Darol

Commenter Submittals:
A Letter dated Dec. 17, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Dredging methods | Favors use of hydraulic dredging | 5.19 |
| 2 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 4 | EIS | Marina comments | Opposes development of new marina | 6.8 |
| 5 | EIS | Alternative ASB reuse | Favors upland reuse of ASB | 6.9 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

1457 Grant Street
Bellingham, WA 98225-4920
December 17, 2006

Lucille McInerney
Department of Ecology
3190 - 160th Ave
Bellevue, WA 98008-5452

If Whatcom Creek waterway is to be cleaned of toxic mercury by suction 1
dredging (and I think it should be), then I prefer that those sediments be
collected nearby in a lined and capped containment monitored by Department of 2
Ecology as a public demonstration of how such toxics can be dealt with safely.

This poisonous muck is our legacy of decades of industry at that site and the detritus should remain near so the public can see exactly how it is treated. It should not be loaded onto trucks and hauled to some unseen "dump."

Too often people assume that dirty refuse can just be thrown "away" down the drain or into a garbage can: out of sight, out of mind. The pollution problem in our Bay has accumulated over many years while the pulp mill provided jobs and revenue and profits. Local industry poisoned our immediate environs. It is time to acknowledge this damage and show how we responsibly heal the damage. We should own the situation without assuming we can dump it on someone else, somewhere else.

Having been used for pollution remediation for two decades, the Aeration 1
Basin provides a logical site for holding the dredged spoils. It can be inspected
and relined, be provided with numerous wells to monitor for perimeter leakage, and
can be covered and capped to allow for parkland and commercial use. 2

Compared to using the basin as a boat marina, fifty times as many people could use it as a park. And this is in addition to accomodating tons of effluent. If the port wants more boat storage, it should be on dry land where they built their ugly warehouse for GP to use.

I have been a Bellingham resident the past 36 of my fifty-four years. 3

Thank you.

Sincerely,

Darol Streib

Darol Streib

Commenter No. Name / Organization
140 Tavelli, Terry

Commenter Submittals:
A E-mail dated Dec. 14, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Navigation changes | Support for multi-purpose waterway | 6.7 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

**From:** Terry Tavelli [mailto:ttavelli@TREEV.COM]
**Sent:** Thursday, December 14, 2006 4:31 PM
**To:** McInerney, Lucy (ECY)
**Cc:** Ray Poorman; Callery, Alan (Cottage Computing)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms. McInerney:

I am a Whatcom County resident and a frequent user of Bellingham Bay for boating and recreational purposes.

I have reviewed the draft RI/FS and EIS report documents for the Whatcom Waterway Site and wish to cast my support of the preferred alternatives 5 and 6 as they are currently documented. 1

Thank you for your time and commitment in planning a waterfront development that promotes a healthy marine environment as well as our local economy through the development of a multi-purpose waterway and aquatic use for the ASB area. 2

Best regards,

**Terry Tavelli**

Vice Commodore

**Bellingham Yacht Club**
vicecommodore@byc.org

Commenter No. Name / Organization
141 Teesdale, Mary

Commenter Submittals:
A E-mail dated Dec. 13, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Preference not clear or not stated | 5.1 & Table 5-2 |
| 2 | RI | Seafood quality | Concerns over seafood quality | 4.4 |
| 3 | FS | Remedy preferences | Preference not clear or not stated | 5.1 & Table 5-2 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Mary Teesdale [mailto:meteesdale@hotmail.com]
Sent: Wednesday, December 13, 2006 8:15 PM
To: McInerney, Lucy (ECY)
Subject: Mercury - clean it up now!

We will never have a pristine, thriving bay if we leave the mercury there. 1
Be assured the mercury will come back to haunt us sometime. Let's bite the bullet now, clean it up and never let it happen again! Lesson learned.

One thing for sure, we will never regret doing the right thing and restoring our bay to it's highest level. We will regret any other solution.

The sooner we get our bay producing good wholesome food for us, the more 2

prosperous and sustainable our community will be.

Please insist on full clean-up. We need the bay for our food source. 1

Mary Teesdale

Commenter No. | Name / Organization
---|---
142 | Thane, Niki

Commenter Submittals:

- A  E-mail dated Dec 17, 2006
- B  Public hearing transcript excerpt

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Wind & wave erosion | Ability to predict wave erosion | 5.3 |
| 2 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 3 | EIS | Additional habitat | Favors habitat use in inner waterway | 5.22 & 6.10 |
| 4 | FS | Capping costs | Costs of long-term cap monitoring | 5.11 |
| 5 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 6 | RI | Cleanup levels | Roles of SMS and BSL in cleanup action | 4.2 |
| 7 | RI | Seafood quality | Concerns about seafood quality in Bay | 4.4 |
| 8 | FS | Project funding | Favors tax increases for additional cleanup | 5.26 |
| | | | | |

**Notes:**

- EIS  Supplemental Environmental Impact Statement
- FS  Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI  Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS  Responsiveness Summary (Narrative)

#1-A

**From:** maxart@telcomplus.net [mailto:maxart@telcomplus.net]
**Sent:** Sunday, December 17, 2006 10:47 PM
**To:** McInerney, Lucy (ECY)
**Cc:** waters@re-sources.org; Bellingham Bay Foundation
**Subject:** Comment on B'ham Bay RI/FS

Lucille T. McInerney, P.E. Site Manager
Washington State Department of Ecology

December 17, 2006

Dear Ms. McInerney,
I am writing to comment on the RI/FS for the Environmental Impact Statement for the redevelopment of the Bellingham Waterfront. My reading of the RI/FS leaves me with serious concerns about the working assumptions used to decide important matters for the future of our local environment, and I would like to object to three of these assumptions.

<u>Assumption 1.</u> We have a technology to prevent recontamination of restored areas, and can ensure that three to six feet of "clean" cover will remain in place over sediments contaminated as deep as 12 feet.

Erosion of the cap installed over the toxins in the Log Pond already indicates that we do not fully understand the workings of tide and currents. **Installing additional bulk and height to various areas of the bay floor and the shoreline as sediment caps will alter erosional processes in ways that we cannot predict.** Also, no one can possibly foresee how currents will be changed by the opening of the breakwater of the ASB; it has never been exposed to open currents since it was built. 1

In addition, it is probable that recontamination of installed caps will occur, without the removal of mercury at every highly contaminated site –the Inner Waterway, the head of the Waterway, Starr Rock, the Log Pond, and the eroding SW corner of the ASB, to begin with. Prudence dictates that we assume, not an average high storm, but the worst-case storm surge plus a factor of safety. Capping toxic sludge in place is not a prudent plan. We in the community truly are attempting to advocate for Bellingham's hundred year future. 2

<u>Assumption 2.</u> Dredging of the Whatcom Waterway is only feasible if the waterway is subsequently used for commercial purposes.

Removing toxins from the waterway is no longer encouraged as it was in the original RI/FS. This stands out as an awkward position to defend, since removing toxic sediment was originally determined to be necessary for future industrial use of the property, but is no longer deemed important for uses that will include human and animal contact with the tidal flats.

**I would like to see the entire mouth of Whatcom Creek --the Inner Waterway and the Outer Waterway-- dredged to remove as much mercury and other contaminants as possible**, and then restored with clean sediment as a toxin-free base for re-establishment of healthy wildlife in our estuary and bay. Removal of the bulk of toxins may be a more expensive 1

alternative in the short-term, but over the long-term, monitoring and cap maintenance costs, 2
*which have not been sufficiently addressed in the current RI/FS*, would be much less. Removal 3
of contaminated sediments will certainly impair much habitat in the near-term, but will assure less contamination is present in future habitat.

Assumption 3. Bioassays of creatures exposed to bay sediments, overriding chemical tests of mercury concentrations in the near shore sediments, show that the sediments are safe for human consumption.

Standard practices require far too few chemical tests and bioassays for the scope and intricate complexity of this property, and its proposed and publicly intended uses. Twenty-five samples on more than a hundred acres over 5-10 years is not an adequate sampling to determine with any degree of certainty the extent to which contamination complications may plague our community
for decades to come. Standard practices have put us in the challenging position of having to cope #4-B
with mercury toxin. This community is eager to see better standards than required applied to the clean-up of our bay.

Minimum clean-up levels are set, one would assume, to be a minimum at which clean-up is mandatory; and yet, for an intended purpose, such as the urgent desire for a boat facility, these numbers seem to be "flexible," jeopardizing health and environmental welfare for commercial shortcuts. **Every site at which toxic chemical levels exist above unquestionably SAFE for human consumption/contact should be required to be cleaned up at least to the minimum level of 0.59 parts per million.**

Many citizens of Bellingham expect to be able to walk and play on as much of this shoreline as we can wrestle out of the hands of Commerce. We expect to be liberated from concerns of exposure to toxins while handling the sand and stones, and breathing the air evaporated from
them on a hot summer day. More to the point, I would dearly love to eat seafood out of 4
Bellingham Bay some day, but I would not do so now, even at the "one serving per week" supposed safe limit. Mercury never leaves a body once it has been ingested, that's why it bioaccumulates in flesh. "Safe" consumption limits are set presuming that contamination a person is exposed to in a lifetime will not increase, but even a casual acquaintance with current affairs makes that presumption questionable, with mercury levels in the entire Puget Sound up for rigorous scientific discussion.

**What can we do to assure that our grandchildren may be able to eat safely from our near-shore waters? Thoroughly remove the mercury contamination there.**

Thank you for this opportunity to comment.

*Niki Thane*

1601 J Street
Bellingham WA 98225
maxart@telcomplus.net

4

**EXCERPTS FROM PUBLIC HEARING TRANSCRIPT**
**December 11, 2006, Bellingham Cruise Terminal**

**Niki Thane**
My name is Niki Thane and I'm a resident of the Lettered Streets Neighborhood. I'm not very eloquent so I just wanted to say one short thing. There has been a lot of talk tonight about costs, cost analysis, cost savings, escaping costs one person said. I think that the difference between the full dredge alternative which the latest speaker just said is sort of over-estimating the cost of truly dredging the contaminated sediment rather then just dredging all of the sediment. I think that the difference in cost of $30 million between alternatives 5 and 6 and the full dredge alternative is really chump change. $30 million is a very small amount for the benefits of removing the sediments so it is no longer in the water table and more susceptible to being moved around.

I don't know if you know, being not from the Bellingham area but the Bellingham residents just
voted a $44 million tax on ourselves for a greenways levy and I think it would be just as likely 5
the citizens of Bellingham would just as likely, additionally add a $30 million tax on themselves to have this mercury removed rather than left in place. Thank you.

<u>Commenter No.</u> 143 — <u>Name / Organization</u> Thomas, Craig

| Commenter No. | Name / Organization |
|---|---|
| 143 | Thomas, Craig |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 18, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Seismic stability | Potential cap disturbance during earthquakes | 5.7 |
| 2 | FS | Tsunami risks | Potential for cap erosion during tsunami | 5.7 |
| 3 | FS | Whatcom creek flooding | Potential cap erosion during creek flooding | 5.5 |
| 4 | FS | Navigation disturbances | Potential disturbance from vessel grounding | 5.4 |
| 5 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

-----Original Message-----
From: Craig Thomas [mailto:sarahthomas5@comcast.net]
Sent: Monday, December 18, 2006 11:12 AM
To: McInerney, Lucy (ECY)
Subject: Clean up of Bellingham Bay

To Whom It May Concern,

There should be no question as to the clean up the former G.P. site in Bellingham Bay. Mercury is a known poison and should be cleaned up to highest standards, with complete removal. Here are several reasons why I feel this way.

1 Removal costs may high now but in the future they will increase.
2 A large scale seismic event could cause the sediment cap to liquify releasing the toxic mercury. 1
3 A tsunami in this region could erode the sediment cap. 2
4 Whatcom creek could have a larger than normal flow eroding the sediment cap.
5 A large vessel running aground cloud liberate the mercury. 1

There is no way one could guarantee 100% that if the mercury is left in place with a sediment cap that we won't be facing some kind of environmental emergency in the future. We live in a dynamic area which is constantly undergoing change some large and some small. It would be in our communities best interest to completely remove the mercury from Bellingham Bay. We don't want to have a future where we can't eat the fish we catch or swim in our local waters. 2 3

Sincerely,

Craig Thomas
896 Marine Drive
Bellingham, WA 98225
360 647-6343

Commenter No.   Name / Organization
144   Thompson, Bud (Virgil)

Commenter Submittals:
A   E-mail dated Dec. 15, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

**From:** Thompson, Virgil (Bud) [mailto:thompsonv@gonzaga.edu]
**Sent:** Friday, December 15, 2006 8:10 AM
**To:** McInerney, Lucy (ECY)
**Subject:**

December 15, 2006

Dear Ms McInerney:

I am a Whatcom County summer resident who frequents Bellingham Bay. I have reviewed the draft RI/FS and EIS documents for the Whatcom Waterway Site. I am in support of the preferred alternatives 5 and 6 as they are currently documented. Thank you for your time and commitment to the future of the area. 1

Regards,
Virgil Thompson
402 Boulevard #303
Bellingham

**Bud Thompson**

**Instructor, Religious Studies**

502 E. Boone Ave.
Spokane, WA 99258
509.323.6713 direct
509.953.4715 cell
http://www.gonzaga.edu

Commenter No. | Name / Organization
---|---
145 | Thompson, Rick

Commenter Submittals:

A E-mail dated Dec. 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

**From:** AirGeek2@aol.com [mailto:AirGeek2@aol.com]
**Sent:** Thursday, December 14, 2006 3:23 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Whatcom Waterway RI/FS/EIS Public Input

Dear Ms McInerney,
I am a Whatcom County resident that frequents Bellingham Bay. I have reviewed the draft RI/FS and EIS documents for the Whatcom Waterway Site. I am in support of the preferred alternatives 5 and 6 as they are currently documented. Thank you for your time and commitment to the future of the area. 1
Regards,
Rick Thompson

Commenter No. Name / Organization
146 Trautman, Kevin

Commenter Submittals:
A Letter dated Dec. 16, 2006

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 2 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

**Kevin Trautman**
**1225 E Sunset Drive #145-440**
**Bellingham, WA 98226**

RECEIVED
DEC 1 8 2006
DEPT OF ECOLOGY
BELLINGHAM FIELD OFFICE

December 16, 2006

Ms. McInerney
Department of the Ecology

Re: Whatcom Waterway RI/FS/EIS Public Imput

Dear Ms. McInerney:

I am a Whatcom County (Bellingham) resident that has used Bellingham Bay extensively for boating purposes for the past five years.

I believe that through providing additional moorage a the future marina, we could fulfill needs of not only the Whatcom County residents that have been waiting years for moorage but we could at the same time, provide an enticing destination for boaters everywhere. Currently the faciliities are limited and therefore we pull relatively few visiting boats in to Bellingham because of it. 1

As a boater, making the decision of where to procure needed groceries, liquor, parts, services, etc. is based upon the ease of getting what is needed, preferably within walking distance of the harbor. When there are "touristy" things to see and do, that is even better.

Hundreds of boats go right past our door, as they cruise the San Juans and Gulf Islands, just looking for a place to spend their money. A new "boater friendly" marina, with easy access to goods and services and entertainment would lure them to Bellingham and would boost Bellingham's revenue considerably. "Build it and they will come".

I have read the draft RI/FS and EIS documents for the Whatcom Waterway Site and support the preferred alternatives #5 and #6 as they are currently documented. As a boater, I could not possibly support any plan that did <u>not</u> include a future marina facility when it so obviously benefits the entire community as a whole. 2

Thank you for your time and commitment to the future of our community.

Sincerely,

Kevin Trautman

Commenter No. | Name / Organization
---|---
147 | Van Dyken, Roger

Commenter Submittals:

A E-mail dated Dec. 18, 2006

| Comment Number | Summary of Comment: Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Marina comments | Support for development of new marina | 6.8 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Roger Van Dyken [mailto:roger@sanjuansailing.com]
**Sent:** Monday, December 18, 2006 3:48 PM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham Bay

Dear staff,
I approve of the Port of Bellingham's cleanup plans. I am a tenant of the Port for more than 25 years, and a member of the Marina Advisory Committee. As such, I have both worked with the Port and observed first hand their continuing commitment to the ecology of the waters. They are sensitive to environmental concerns and repeatedly initiated procedures to protect the environment (sometimes, arguably, even to excess). I have no doubt as to their commitment to the environment.
Further, as a boater here for 30 years, the improvement in the waters here have been drastic. Marine growth is far more prolific than formerly, due to a variety of factors, including the Port's commitment.
From all that I have read, the Port's plans for treating the contaminants as well as opening up 30 1
additional acres of restored marine habitat will continue the enhancement of the marine
environment in which I live, work, and recreate. 2
Thank you for your consideration.
Sincerely,

Roger Van Dyken, President
San Juan Sailing
1251 South Harbor Loop #1
Bellingham, WA 98225

Commenter No. | Name / Organization
---|---
148 | Vanderwyst, Max

Commenter Submittals:

A	Letter dated Nov 27, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |

**Notes:**

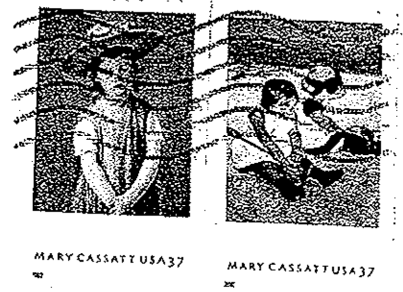
- EIS Supplemental Environmental Impact Statement
- FS Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS Responsiveness Summary (Narrative)

Re: Whatcom Waterway Site Cleanup

Dear Ms. McInerney,

EVERETT WA 982

27 NOV 2006 PM 1 T




#1-A

As a Resident of Whatcom County
I find it unacceptable ~~that I~~ to have the
murcury in the bay mearly covered up.
I. Insist on it being removed from the bay
for the Safety of community. 1

Max Vanderwyst

Recycle

Place stamp here

neopost

first class

$0.39

11/27/06

Mailed From 98226

US POSTAGE

... ille I. McInerney, P.E., Site Manager
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue
Bellevue, WA 98008-5452

Commenter No.   Name / Organization

149   Victoria San Juan Cruises

Commenter Submittals:

A   Letter dated Nov. 14, 2006   Drew Schmidt (President)

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Navigation changes | Supports continued deep-draft use at BST | 6.7 |
| 3 | EIS | Marina comments | Supports development of new marina | 6.8 |
| 4 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

EIS   Supplemental Environmental Impact Statement

FS   Feasibility Study (Volume 2 of Supplemental RI/FS)

RI   Remedial Investigation (Volume 1 of Supplemental RI/FS)

RS   Responsiveness Summary (Narrative)

#1-A

VICTORIA·SAN JUAN CRUISES

PACIFIC CRUISES NORTHWEST, INC. – 355 HARRIS AVENUE, SUITE 104 – BELLINGHAM, WA 98225
360.738.8099 – 800.443.4552 – FAX 360.738.7685

14 November 2006

Lucille T. McInerney, P.E.
Site Manager
Department of Ecology
3190 160th Place
Bellevue, WA 98008-5452

RE: Whatcom Waterway Site Cleanup.

Dear Ms. McInerney:

I would like to be included in the written comments for the above mentioned cleanup project.

In reviewing the benefits ands impacts of the eight alternative cleanup options I find options 5 and 6 to be the most practical and preferable. 1

Of paramount importance in this plan are 1) maintaining deep-draft navigation near the shipping terminal and, 2) removing contaminates from the ASB required to create a new marina space. 2

Beyond dredging required for navigational use I believe capping the sediments in place to be preferable to attempting removal of the contaminates. 1

Again, please register my support of <u>Alternatives 5 and 6</u> in the waterway cleanup plan. 2

Sincerely,

Captain Drew M. Schmidt
President

| Commenter No. | Name / Organization |
|---|---|
| 150 | Washington Department of Fish & Wildlife |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Dec. 16, 2006 | Brian Williams (Region 4 Area Habitat Biologist) |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Cap effectiveness | Conditional support for capping technology | 5.2 |
| 3 | EIS | Recent habitat studies | References to additional studies | 6.4 |
| 4 | EIS | Recent habitat studies | References to additional studies | 6.4 |
| 5 | FS | Dredging residuals | Management of dredge residuals | 5.16 |
| 6 | EIS | Habitat benches | Optimum elevations for eel grass habitat | 6.5 |
| 7 | FS | Cap design | Design of caps to address navigation uses | 5.8 |
| 8 | FS | Cap design | Design of caps to address navigation uses | 5.8 |
| 9 | RI | Natural recovery | Differences in sedimentation rate in waterway | 4.6 |
| 10 | FS | Unit 3A cleanup | Recommends consideration of capping | 5.21 |
| 11 | FS | Cap design | Recommends use of thick cap | 5.8 |
| 12 | FS | Cap design | Capping thickness in Unit 1-C | 5.8 |
| 13 | FS | Cap design | Cap placement for Unit 1-C | 5.8 |
| 14 | EIS | Eel grass | Recommends updated eel grass survey | 6.5 |
| 15 | FS | Design & permitting | Desires comment opportunity during design | 5.27 |
| 16 | FS | Cap monitoring | Development of detailed monitoring plan | 5.10 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

State of Washington

**DEPARTMENT OF FISH AND WILDLIFE**

Region 4 Office: 16018 Mill Creek Boulevard - Mill Creek, Washington 98012 - (425) 775-1311

December 16, 2006

Washington Department of Ecology
Attention: Lucille McInerney
3190 160th Avenue
Bellevue, Washington 98008-5452

**SUBJECT: WDFW Comments – Draft Supplemental Environmental Impact Statement: Bellingham Bay Comprehensive Strategy – Whatcom Waterway Cleanup Site**

Dear Mrs. McInerney,

The Washington Department of Fish and Wildlife (WDFW) has reviewed the Draft Supplemental Environmental Impact Statement: Bellingham Bay Comprehensive Strategy – Whatcom Waterway Cleanup Site and offer the following comments for your consideration. WDFW may submit additional comments in the future as the Cleanup Action Plan for the Whatcom Waterway Cleanup Site is developed.

## General DEIS Comments:

1. WDFW concurs with the alternative analysis presented in the Draft Supplemental Environmental Impact Statement: Bellingham Bay Comprehensive Strategy – Whatcom Waterway Cleanup Site. In light of the land use changes proposed for the Whatcom Waterway and the nature of the contaminants, WDFW supports cleanup Alternatives 5 and 6. Alternative 5 and 6 both satisfy the state's rigorous sediment cleanup standards, are consistent with the goals of the Bellingham Bay Demonstration Pilot, are consistent with the Bellingham Bay Comprehensive Strategy, effectively mitigate natural resource impacts through a broad range of habitat enhancement and creation actions, and can be implemented in a realistic time frame. 1

2. WDFW's support for Alternatives 5 and 6 is based on the assumption that the proposed dredging and capping technologies will effectively provide long-term isolation of the contaminants from the biologically active environment and the natural resources in Bellingham Bay. 2

## Specific DEIS Comments:

3. Page 3-27: More recent fish data is available for Bellingham Bay than what is referenced

in the DEIS, i.e. Inner Bellingham Bay Juvenile Chinook Study Lummi Natural
Resources Data Report (2005) and NOAA Fisheries 2003 Bellingham Bay Juvenile 1
Chinook Townetting Project Field Sampling and Data Summary (2004).

4. Page 3-37: The discussion regarding the effects of over water structures on the nearshore 2
migration of juvenile salmon is weak and could be further developed. I would refer you
the following research report that was contracted by the Washington Department of
Transportation: Impacts Of Ferry Terminals On Juvenile Salmon Migrating Along Puget
Sound Shorelines, Phase 1: Synthesis Of State Of Knowledge (1999).

5. Greater detail should be provided in the Cleanup Action Plan for the Whatcom Waterway 3
Cleanup Site regarding how residual contaminants from the proposed dredging activities
will be controlled and isolated from the biologically active environment and the natural
resources in Bellingham Bay.

6. Figure 3-4: The bed elevations for the preliminary marina habitat bench design that are #4-B
illustrated in the DEIS are too shallow support eelgrass habitat. The bed elevations for
the habitat bench would need to between the 0.00 and –8.0 (MLLW = 0.00) tide
elevations to support eelgrass habitat (Zostera marina) in inner Bellingham Bay.

7. Page 3-52: The proposed sediment cap in the vicinity of the Port's Barge Dock facility is
not clearly defined. The thickness of the sediment cap will need to not only effectively
isolate the identified contaminants from the biologically active zone and the natural
resources in Bellingham Bay but is will also need to be compatible with future vessel 6
activities at the Barge Dock facility. The future vessel activities at the Barge Dock
facility are also not clearly defined.

8. Page 3-5: The DEIS states that the navigation priorities for the inner Whatcom Waterway
are still being analyzed. How does this issue get finalized? The cap design in this area 4
will need to be compatible with the future vessel activities identified for the inner
Whatcom Waterway.

9. Page 3-14: The DEIS discusses natural sedimentation rates in the waterway and states
that they vary greatly. The natural sedimentation rates in the waterway need to be
discussed in more detail in the Cleanup Action Plan. A map of the Whatcom Waterway 4
that illustrates sedimentation rates for the different waterway units would be helpful.

10. Page 3-14: The DEIS states that the inner waterway, Unit 3A, relies on natural recovery.
Is the existing sediment cap sufficient to isolate the contaminants from the biologically
active zone and the natural resources in Bellingham Bay? Is the natural sedimentation
rate in this unit sufficient to sustain and augment the existing sediment cap long term
while also accommodating proposed or inadvertent vessel traffic in this unit? It may be
beneficial to consider augmenting the existing sediment cap in this unit to provide greater
assurance that the contaminated sediments will remain isolated and to provide an 5
opportunity to enhance the diversity and functional benefits of the habitat.

11. Page 4-41: The DEIS states that a 3' to 6' sediment cap will be applied to the inner
waterway where dredged and where residual contamination occurs. WDFW recommends

that a 6-foot cap be applied in these units to ensure that the contaminants are sufficiently isolated from the biologically active zone and natural resources in Bellingham Bay. #5-A

12. The DEIS does not provide specifics regarding the depth of the cap that will be applied to Unit 1C following dredging. WDFW recommends that a 6-foot cap be applied in this unit to ensure that the contaminants are sufficiently isolated from the biologically active zone and natural resources in Bellingham Bay. 3

13. Page 4-40: The DEIS does not break Unit 1 into subsections and gives the impression that the entire unit will be capped. However, Table 4-2 and Figure 4-6 break Unit 1 into subsections and note that only Unit 1C will be capped following dredging. This should be clarified in the Cleanup Action Plan. 13

14. The eelgrass habitat (Zostera marina) within the Whatcom Waterway Cleanup Site should be updated during the development of the Cleanup Action Plan for the preferred cleanup alternative. The eelgrass data in the Bellingham Bay Pilot Data Compilation Report is outdated. An updated inventory of the eelgrass habitats within the Whatcom Waterway Cleanup Site will allow the impacts and benefits of the preferred clean up alternative to be fully evaluated. 4

15. The marina design presented in the DEIS is preliminary. WDFW would like to be consulted during the process that finalizes the marina design. 2

16. The proposed sediment caps will need to be monitored long term. The monitoring plan and the timeline for implementing the monitoring plan will need to be developed in greater detail in the Cleanup Action Plan. 1

WDFW appreciates the opportunity to provide these comments. If you have any questions, please call me at (360) 466-4345, extension 250.

Sincerely,

Brian Williams

Brian Williams
Area Habitat Biologist
Region 4

Commenter No. | Name / Organization
---|---
151 | Washington Department of Natural Resources

Commenter Submittals:

A  Letter dated Dec. 6, 2006  Francea L. McNair (Aquatic Lands Steward)

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | EIS | Navigation changes | Support for navigation use updates | 6.7 |
| 2 | EIS | Land use changes | Support for land use changes | 6.6 |
| 3 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

- EIS  Supplemental Environmental Impact Statement
- FS  Feasibility Study (Volume 2 of Supplemental RI/FS)
- RI  Remedial Investigation (Volume 1 of Supplemental RI/FS)
- RS  Responsiveness Summary (Narrative)

WASHINGTON STATE DEPARTMENT OF
**Natural Resources**

DOUG SUTHERLAND
Commissioner of Public Lands

#1-A

December 6, 2006

Lucille T. McInerney, Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Re: Whatcom Waterway Site – Draft RI/FS and Draft EIS Documents

Dear Ms. McInerney:

As one of the principle state agencies participating in the Bellingham Bay Demonstration Pilot, I am writing to express my support for Alternative 6, as described in the October 10, 2006, *Draft Supplemental RI/FS and EIS* documents for the site. This letter supplements the Department of Natural Resources (DNR) comments on the Whatcom Waterway site sent by Chad Unland on July 20, 2006.

Under the Pilot, Ecology and DNR have worked cooperatively with the local community to develop land management plans for state-owned aquatic land, including habitat restoration, sediment cleanup and sustainable land use. In October 2000 the team published a Comprehensive Strategy for Bellingham Bay, which has provided guidance and policies for site cleanup and habitat restoration. DNR has worked cooperatively on the several revisions to the October 2000 Comprehensive Strategy to incorporate revised local land use plans that affect state owned aquatic land.

The Port has also been working with DNR both under the interagency agreement establishing the Bellingham Bay Demonstration Pilot, and a more recent Memorandum of Understanding that supports the community vision for creating a new waterfront. Under this MOU, the Port and DNR are addressing appropriate adjustments to state harbor areas, waterways, property 1
management, environmental remediation and habitat restoration. These discussions are still in progress, including appropriate public involvement. For instance, DNR is currently reviewing, under a public process, Port requested changes to the Bellingham Harbor Area. These and other changes are being closely coordinated with Ecology's progress on the Whatcom Waterway site and the Port and City's progress on local land use and shoreline planning.

DNR appreciates the opportunity to review and comment on the draft documents for the Whatcom Waterway site and Ecology's clear intention to select a remedial approach for the site that reflects the profound transition in waterfront land use that is occurring in Bellingham. Given 2
the nature of the contamination problems and the changes in community land use DNR concurs

with the evaluation of the range of cleanup alternatives described in the Whatcom Waterway documents. Alternative 6 provides a cleanup approach for the Whatcom Waterway site that not only meets the state's stringent criteria for sediment cleanup, but also supports state-wide goals for salmon recovery, management of state-owned aquatic lands, and the local community's vision for waterfront cleanup and redevelopment.

Based on the information provided in the documents and our ongoing discussions with the Port 1
of Bellingham, and in consideration of the Department's July 20, 2006 comments, we recommend Alternative 6 as a feasible approach for site cleanup under MTCA. This alternative meets the goals and objectives of the current Comprehensive Strategy for Bellingham Bay, and DNR's overall interests in the management of state-owned aquatic land.

We look forward to continuing our work with Ecology, the Port, and the other agency participants in the Pilot through the coming years. Please contact David Roberts, Assistant Regional Manager at 360-854-2805 if you would like additional information.

Sincerely,

Francea L. McNair
Aquatic Lands Steward

cc: Port of Bellingham
David Roberts, DNR

Commenter No. | Name / Organization
---|---
152 | Webber, Bert

Commenter Submittals:

A Letter dated Nov. 27, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | EIS | Marina comments | Favors development of new marina | 6.8 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

November 27, 2006

Lucille McInerney, Site Manager
Department of Ecology
3190 160th Ave
Bellevue, WA, 98008-5452

Dear Ms McInerney

I am writing to voice my support for the conversion of the GP treatment lagoon to a marina facility and would like to have my comments included in the record of the Public Hearing to be held on Dec 11 in Bellingham. 1

In my opinion, restoring lost or degraded shallow water estuarine habitat is one of the most important objectives in considering redevelopment plans for the old GP site. To fill in the treatment lagoon will result in the permanent loss of the land to the estuarine system.

Some argue that marinas should not be considered to have estuarine habitat value. I disagree. Over the years I have frequently seen clear evidence of an active ecosystem in the Squalicium harbor marinas. In the spring schools of small salmon – probably chums from the Maritime Hatchery can be seen taking shelter among the floats. Historically, I have, during the periods of clear water in late January, caught smelt off the docks in their annual migration through Bellingham Bay. It is common the see Western Grebes Common Loons and Cormorants fishing inside the marinas, and in the winter there is usually a group of golden eyes (that feed on shellfish) frequenting the marina.

The skeletons of Dungeness crab are obvious on the docks, left by feeding otters. At low tides, sea stars are common on the bottom, and the pilings are covered with a thick growth of marine organisms at low tide.

People have commented to me that because there is a low diversity of organisms on the floats that the water quality of the marina must be polluted from the moored boats. This is not the case. As the Nooksack River increases flow with rain events in the winter a surface layer of fresh water flows through the marinas. Only a few estuarine organisms are tolerant of this periodic fresh water. However, what is there, is there in profusion. The stringy brownish plant growth that covers the floats is a rich growth of diatoms. If we look closer at the small animals in among the mussels and barnacles, we find large members of small crustaceans that are food for juvenile fish

In all, these casual observations clearly show that the Squalicum Harbor marinas have a thriving estuarine ecosystem. Over the years I have noted that the boat owners of the marinas are slowly becoming more responsible for the pollution associated with their vessels. I expect that the new marina will have responsible tenants and that there will be a healthy ecosystem that will be part of the estuarine complex associated with Whatcom Creek and the Nooksack River.

If I can provide any further assistance in forwarding the proposal of restoring the lagoon site please contact me.

Sincerely

Bert Webber
Professor Emeritus, Huxley College of the Environment.

| Commenter No. | Name / Organization |
|---|---|
| 153 | Weeks, Jennifer |

Commenter Submittals:

| | |
|---|---|
| A | Letter dated Dec. 16, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Capping concerns | Concerns about long-term effectiveness | 5.2 |
| 3 | RI | Cleanup levels | Use of bioassays, SMS & BSL at site | 4.2 |
| 4 | RI | BSL Basis | Fish consumption rates | 4.3 |
| 5 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

Jennifer Weeks
2505 Monroe Street
Bellingham, WA 98225
360-733-6373
jenkw69@hotmail.com

Department of Ecology
3190 160th Avenue,
Bellevue, WA 98008-5452

December 16, 2006

Attn: Lucille T. McInerney
Re: Public Comment on Whatcom Waterway RI/FS

I am writing as part of the public comment process of the Department of Ecology's Remedial Investigation/ Feasibility Study for Whatcom Waterway. It is my firm belief that the DOE must insist on the most stringent cleanup possible of the contaminated sediments within the study area. We are dealing with a toxin that is readily biologically converted to methyl-mercury, easily assimilated by living organisms, known to bioaccumulate, and has well documented costs to human health.

In reviewing the proposed alternatives it seems to me DOE is committing a great disservice to the public by advocating Alternative #6 as "preferred". My understanding that this alternative would remove contaminated sediment from the Aerated Stabilization Basin and place it within Whatcom Waterway to then be capped under 3ft (or 6ft as the DOE is advocating) of clean fill is unacceptable. If the bulk of contaminated sediment is to remain in the aquatic environment at all then this effort, and all the money spent on it, will be a failure in 'clean up' and leave a legacy of pollution for the people of Bellingham to deal with in the future. If a motivating factor in the DOE's support for Alternative #6 is to allow the Port to construct a Marina in the ASB location, then I believe you are acting with serious negligence in your duty to protect the aquatic ecosystem we all depend on by acquiescing to political and monetary pressures. 1

Cost is often offered as a reason we can't do the best environmental cleanup possible. Many people have spoken to the fact that the cost estimates for the proposed alternatives do not necessarily reflect the likely true costs they will each present. Given the number of questions people are raising about the 'true costs' of the various alternatives, it seems at the very least imprudent to rely on 'cost' as an argument when dealing with a toxin that will never biodegrade. We know the log pond cap is in need of repairs; the costs are high relative to the initial capping costs. There is no guarantee we will escape this same fate with a cap in the waterway. 2

Additionally, I have concerns about the three standards under which cleanup can be mandated, the SQS (sediment quality standard 0.41 ppm), the MCL (minimum cleanup level 0.59 ppm), and the BSL (bioaccumulation screening level 1.2 ppm). It is my understanding that the BSL is the level of mercury contamination in the sediment that Ecology determines is an unacceptable risk to those who eat locally caught fish. Further, I understand that the BSL may be used only if biological tests are performed on a few species to determine contamination levels and, given the results, may override previous chemical tests. 1

My first concern over cleanup standard determination is how Ecology determines the consumption level on which the BSL is based. If the DOE is using a fish consumption rate that does not adequately reflect the rate of consumption among our highest fish consuming populations, then these standards inherently fail to adequately protect our native population. My second concern is that, as I understand it, in Bellingham Bay the BSL results overrode 80% of the chemical samples analyzed where the level of mercury tested higher than 0.59 ppm, leaving many contaminated sites (according to MSL standards) untargeted for cleanup. 2

I join many other environmental groups and citizens in advocating that the DOE pursue a full dredge to remove the contaminated sediments from Whatcom Waterway, ASB/ lagoon, and adjacent areas wherever it occurs above the MCL (0.59 parts per million). I believe the long-term benefit to the aquatic ecosystem outweigh the short-term risk of disturbing the contaminated sediment through dredging. 3

I encourage you to act in good faith toward the people of Bellingham who are relying on you to advocate for their best interest in this issue. It is time that the people, their health, and the environment determine the action of the Department of Ecology, not political pressure.

I appreciate the chance to comment on this terribly important issue and offer my appreciation to the Department of Ecology for their hard work and for extending the comment period after our lovely week of snow!

Sincerely,

Jennifer Weeks

| Commenter No. | Name / Organization |
|---|---|
| 154 | Weiner, Emily |

Commenter Submittals:

| | |
|---|---|
| A | Letter dated Dec. 16, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Capping effectiveness | Concerns over long-term effectiveness | 5.2 |
| 2 | FS | Disproportionate cost analysis | Analysis of alternatives | 5.25 |
| 3 | FS | Additional habitat | Preference for habitat backfill after dredging | 5.22 |
| 4 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 5 | EIS | Navigation uses | Support for multi-purpose channel | 6.7 |
| 6 | FS | Additional habitat | Favors habitat backfill after deep dredging | 5.22 |
| 7 | FS | Project funding | Favors funding of additional habitat | 5.26 |
| 8 | FS | Additional habitat | Favors habitat backfill after deep dredging | 5.22 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

Emily Weiner
2729 North Park Drive
Bellingham, WA 98225

Lucille T. McInerney, P.E., Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452
email: lpeb461@ecy.wa.gov

December 16, 2006

Dear Ms. McInerney,

Please consider the following comments on the RI/FS for Whatcom Waterway cleanup.

I believe the best option for cleanup includes dredging the Inner Whatcom Waterway because I am concerned that capping might be disturbed, resulting in release of mercury into Bellingham Bay. 1

Some proponents of capping have said the danger of deep dredging Inner Whatcom Waterway is mercury would be released during the dredging, but I believe Ecology is capable of devising a deep-dredging plan that releases insignificant amounts of mercury into the bay, and which results in the permanent removal of maximum contaminants.

Therefore, to the extent Ecology's cost-benefit analysis penalizes deep-dredging for release of contaminants into the environment, I request Ecology issue a 2007 draft supplemental RI/FS and EIS with those negative ratings corrected. And I request a reconsideration of Ecology's preferred alternatives based on this new analysis. 2

Further, I believe the 2006 draft RI/FS and EIS make a faulty assumption by linking deep dredging of the Inner Whatcom Waterway with a resulting hardened shoreline. This results in negative ratings for deep dredging. 1

The technical expertise exists for first dredging Inner Whatcom Waterway and then building soft shorelines with excellent habitat plus some small-boat access. That these alternatives are missing from the RI/FS and EIS skews the analysis, in my opinion.

Therefore, I request Ecology issue a 2007 draft supplemental RI/FS and EIS with amendments to Alternatives 2, 3, 7 and 8 that would propose and analyze deep dredging Inner Whatcom Waterway and subsequently building soft shorelines with excellent habitat plus some small-boat access.

And I request a new consideration of the Department of Ecology's preferred alternatives based on these new alternatives and new analysis, as well as the new analysis requested earlier in this letter. And I request Ecology choose as its preferred alternative a modified

alternative 7, but with deep dredging, soft shore, excellent habitat and some small-boat 2
access along Inner Whatcom Waterway.

I have been told that several methods exist for first deep dredging, then creating soft
shoreline, excellent habitat and small-boat access – and also ensuring stability for the
banks of Inner Whatcom Waterway. As one example, I am including a rough diagram at
the end of this letter, meant simply to stimulate discussion by the engineering experts
who could devise a plan. Please note that because deep-water navigation is no longer a 3
community goal for Inner Whatcom Waterway, methods to build habitat and small-boat
access that narrow the channel are not problematic.

One of the reasons I believe Ecology has an obligation to present alternatives that combine deep dredging and soft shorelines with excellent habitat is that under alternatives 5, 6, 7 and 8, the ASB is remediated through deep dredging, but the Port of Bellingham has announced that the ASB will become a "Clean Ocean Marina" with soft edges and excellent habitat. However, even though the ASB will be dredged, the RI/FS and EIS do not give that method negative ratings for hard edges. To rate dredging negatively in one instance – Whatcom Waterway -- and not another – the ASB – I believe skews the analysis.

An Ecology employee explained to me, when I raised this issue during an informal
discussion, that Ecology would not consider building soft edges along Whatcom
Waterway (after deep dredging) to be part of cleanup. I'm not sure why building new #4-B
habitat would not be included in cleanup. But if it cannot be, please apply this logic even-
handedly to both the ASB and Inner Whatcom Waterway. And if building soft edges
would have to be done by the community separate from cleanup, please don't let that fact
exclude consideration of this scenario from the analysis. Even if the community would
have to raise the money to build those soft edges separate from cleanup costs, we need to
know how much it would cost, and we need the analysis to make it possible that this
could become the chosen alternative. In other words, please don't let the legal
distinctions of who would pay stand in the way of presenting a complete analysis of a
cleanup alternative that I believe is the most widely supported in Whatcom County. 4

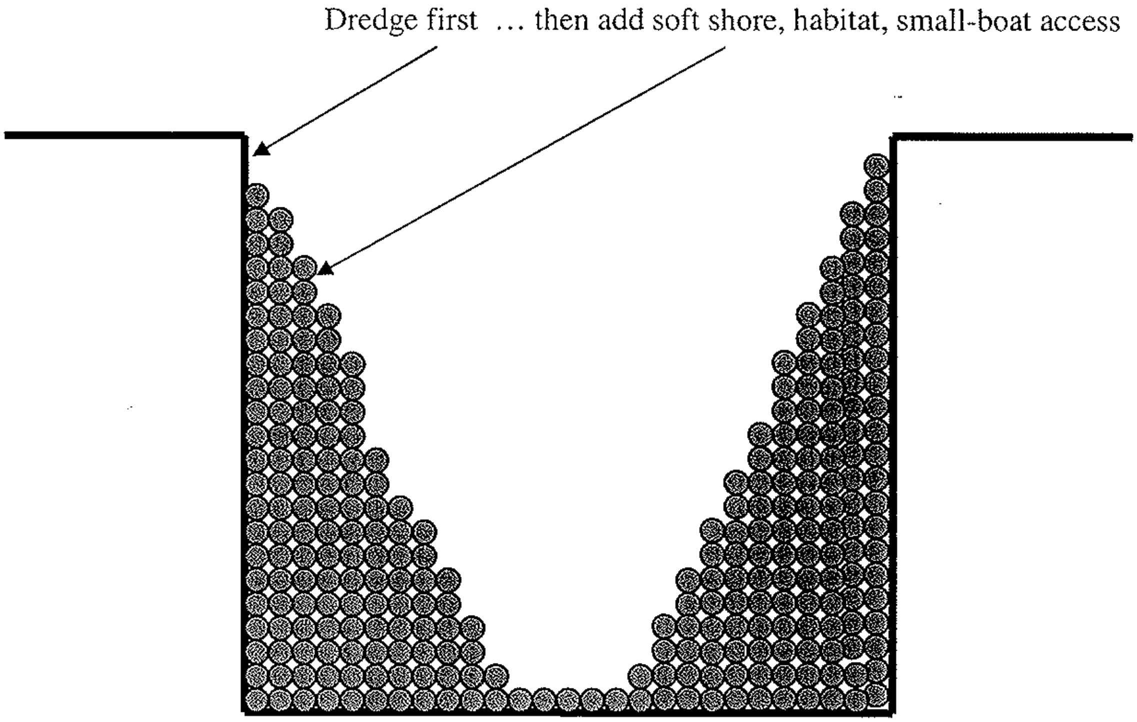
I have read and heard many public comments submitted by other people in the past few weeks. I believe that my comments and theirs have demonstrated enough gaps in alternatives and analysis that Ecology is obligated to issue a new 2007 Draft Supplemental RI/FS and EIS, followed by a comment period, before making a decision.

Thank you for considering my comments. I look forward to them being incorporated and to getting a better cleanup than is projected in the 2006 RI/FS.

Sincerely,

Emily Weiner

**Inner Whatcom Waterway:**




4

Commenter No. | Name / Organization
155 | Weiss, Jack

Commenter Submittals:
A E-mail dated Dec. 17, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| | | | | |
| 1 | FS | Capping effectiveness | Concerns over long-term effectiveness | 5.2 |
| 2 | FS | Log Pond concerns | Concerns about performance of Log Pond | 5.14 |
| 3 | FS | Project funding | Favors additional taxes for cleanup funding | 5.26 |
| 4 | FS | Capping costs | Costs of long-term monitoring | 5.11 |
| 5 | FS | Capping costs | Costs of cap repairs | 5.12 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

**From:** Jack Weiss [mailto:jweiss000@comcast.net]
**Sent:** Sunday, December 17, 2006 9:41 PM
**To:** McInerney, Lucy (ECY)
**Subject:** RI/FS Public Comment

Dear Ms. McInerney:

Some anonymous sage once said, *"If you don't have the time or money to do it right the first time, when will you have the time or money to do it right the second time."*

Common sense dictates that a toxin is not a problem in a community if it is not present. 1
Relying on "cap" technology to entomb toxins is a failed cleanup strategy for this
application. This is especially apparent with the failure of the log pond cap. 2

Realize that the citizens of Bellingham do the right thing when the opportunity is given to them. Recently, this has been the case with a Greenways levy, school bond, and emergency medical service sales tax surcharge. Each of these taxes are the community's show of support for long-term, multi-generational investments in Bellingham.

If a total removal strategy for the waterway triggers an additional cost to our community, 1
I believe the taxpayers will respond favorably. This is particularly true if the citizenry is 2
provided with honest and accurate assessments of how much monitoring expenses will be
over the long-term and what funding would be necessary if a cap were to fail sometime in 3
the future.

Please make the right decision the first time so we (or our children) do not have to make it the second time.

Thank you for the opportunity to comment.

Jack Weiss
2805 Cedarwood Avenue
Bellingham, WA 98225

Commenter No. Name / Organization
156 Wenning, Ralph

Commenter Submittals:
A Letter dated Dec. 14, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Marina comments | Opposes development of new marina | 6.8 |
| 3 | FS | Project funding | Concerns about cost impact on taxpayers | 5.26 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

Lucille T. McInerney
Dept. of Ecology
3190 160th Ave. S. e.
Bellevue, Wa. 98008

December 14, 2006

Dear Ms Mcinerney:

My preference for the Whatcom Waterway cleanup alternatives is number four. 1
Alternative four will result in the best channel at the least cost. Although table four
of the summary indicates a medium benefit value against the project goals, it
appears the benefit would be high since the dredging would be the same as for
alternatives 5 and 6 and there would be less material removed because the ASB
would not be opened. Also the land use of the ASB area would have beneficial
impacts if the marina is excluded. The public interest of developing a marina 2
appears to only in the eyes of the Port Commission since the public has not really
had meaningful input on a proposal that omits the marina.The added cost of
dredging the ASB may not be recovered from marina fees. There would be more
net beneficial impact than the first three alternatives. Alternative four would be the
easiest to accomplish.

When the Port acquired the GP site, there were to be no additional costs to local
taxpayers. With the (early) addition of the marina costs quickly exceeded what
was originally revealed, Local and State taxpayers should not be expected to pick 1
up the tab that would benefit a few. The "public interest" should be considered as
part of the Department of Ecology's decision.

The next best alternative would be number three as it would get the best channel clean-out.

Thank you for the opportunity to comment.

Sincerely,

Ralph Wenning

Ralph Wenning
5010 Festival Blvd, #2B
Bellingham, Wa. 98226

RECEIVED

DEPT OF ECOLOGY

Commenter No. Name / Organization
157 Western Washington University

Commenter Submittals:
A Letter dated Dec. 4, 2006 Brad Smith, Ph.D. (Prefessor & Dean)

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | EIS | Navigation uses | Support for multi-purpose channel | 6.7 |
| 3 | EIS | Navigation uses | Support for multi-purpose channel | 6.7 |
| 4 | FS | Log Pond concerns | Supportive of Log Pond remedy | 5.14 |
| 5 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 6 | EIS | Land use changes | Support for land use changes | 6.6 |
| 7 | EIS | Marina comments | Support for development of new marina | 6.8 |
| 8 | EIS | Navigation uses | Support for multi-purpose channel concept | 6.7 |
| 9 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| | | | | |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

WESTERN
WASHINGTON UNIVERSITY

*An equal opportunity university*

Huxley College of the Environment

516 High Street
Bellingham, Washington 98225-9079
(360) 650-3520 ☐ Fax (360) 650-2842

December 4, 2006

Lucille T. McInerney
Site Manager
Department of Ecology
3190 160th Avenue
Bellevue, WA 98008-5452

Re: Whatcom Waterway Site – Draft RI/FS and Draft EIS Documents

Dear Ms. McInerney:

I am writing to voice my support for Alternative 6, as the preferred remedial approach for addressing the historic contamination problems associated with the Whatcom Waterway site in Bellingham, Washington. Given the nature of the problem and the community's plans for revitalizing that portion of the waterfront, Alternative 6 provides the best opportunity for a solution that meets the fundamental principles of sustainability. 1

In my capacity as Dean of the Huxley College of the Environment at Western Washington University, I have been actively engaged in the complicated process to investigate, evaluate and implement the transition from an industrial waterfront economy to one that that will be based on a more vibrant mix of business, academic, research, residential, and recreational uses. To be successful, this new waterfront must also reconnect our community to Bellingham Bay shorelines that are restored to support natural systems, state-wide salmon recovery, and clean water. Because Alternative 6 is designed to be compatible with natural systems and local land use plans, it offers the best opportunity to demonstrate environmental stewardship at the local level and also as an example for other coastal communities across the state and even nationally. 2

For several years, Western Washington University has been working on plans to accommodate a growing student population. In 2004, as the Port began exploring the possibility of acquiring the Georgia-Pacific property, they invited us to consider the possibility of expanding our campus on the waterfront. Following an intensive period of planning and discussion within the university, we provided a presentation to the Port Commission this April, describing a conceptual proposal for moving certain programs to the waterfront, including Huxley College. The proposal was warmly received by the Port and we are continuing to work in that direction. Under the current plan, the university presence on the waterfront would be on the south side of the waterway between the Log Pond and Laurel Street. The proposal under Alternative 6 to restore shorelines, safely 1 cap deeply buried mercury-contaminated sediments, and convert the Whatcom Waterway to a locally managed channel in this area is compatible with the university's current redevelopment plans.

Huxley College has also been actively engaged in much of the research that has been used in developing the Whatcom Waterway technical documents which are currently under public review. Research performed by Huxley faculty and students have included current studies, sediment investigations, and eco-risk assessments. Most recently, Huxley staff provided benthic studies associated with the 5-year monitoring review of the Log 2
Pond cap, which is an important component of the Remedial Investigation and Feasibility Study. Huxley's research helps confirm that environmental cap at the Log Pond is functioning as designed, with the exception of some erosion around the edges that will be addressed in the final cleanup actions. However, it is clear that this research demonstrates the successful restoration of marine habitat functions that can be expected under Alternative 6.

During our work with the Port, including briefings and site tours that have been provided to our Trustees, faculty, and staff, we have had the chance to discuss numerous technical and policy issues. Our overall impression is that the Department of Ecology has done an outstanding job of requiring the Port to address a very broad range of concerns about ecosystem functions, mercury speciation and toxicology, shoreline stability, seismic and storm events, and the types of human activity that must be considered such as ship traffic, prop wash, dredging operations and beach recreation. Ecology has also required the Port to develop a range of feasible solutions that will meet the State's very stringent and protective standards for sediment quality and water quality in Bellingham Bay.

However, from my perspective, the factor that is the most crucial to the success of the Whatcom Waterway cleanup is the strength of the working relationship between Ecology and the local community. Ecology and the Port have been co-managers of the Bellingham Bay Demonstration Pilot since 1996. Huxley has also participated in this cooperative partnership among federal, state and local agencies, during key phases of the project. We have heard time and again from the Port and City of Bellingham, that Ecology's commitment to this approach has been very much appreciated while the community has been working through the complicated process of visioning, planning and implementing the fundamental transition to a new waterfront economy. By working with the community during this change, Ecology has ensured that the cleanup decision for the Whatcom Waterway site will be aligned with future land uses and therefore sustainable over the long term. Alternative 6 clearly provides the appropriate combination of targeted dredging, removal and dewatering of industrial sludge from the Aerated 3
Stabilization Basin, capping of low-level contamination where it is stable, and off-site disposal of dredged material to an appropriately permitted facility.

These remedial actions under Alternative 6 will allow the community to create a new waterfront that will support a mix of uses and public access to healthy and restored #4-B
shorelines. This solution to our local "Brownfields" problem will provide a significant buffer to Bellingham's growth management challenges, as well as very creative

applications of "soft bank" and habitat benches within urban shorelines. There are
several striking examples of this both/and approach that are evident in Alternative 6. One 4
is the proposed conversion of a large and obsolete industrial wastewater treatment
lagoon, i.e., the ASB, into a new "Clean Ocean Marina", providing restored habitat
functions, new public access and moorage for our local boating community. This is a
unique opportunity to recycle a highly impacted portion of the waterfront and convert it
to a water-dependent facility with a net environmental benefit. Similarly, the restoration
of highly impacted shorelines along the length of Whatcom Waterway will support the 4
community's plans for public access and long contiguous waterfront promenades.

We at Huxley College look forward to being part of this transition and continuing our
research to support appropriate stewardship of Bellingham Bay for generations to come. 5
Alternative 6 provides the best opportunity to realize this potential and I strongly
encourage you to select it as the basis for Ecology's cleanup decision for the Whatcom
Waterway site.

Sincerely,

Brad Smith, Ph.D.
Professor and Dean

| Commenter No. | Name / Organization |
|---|---|
| 158 | Whatcom County Health Department |

Commenter Submittals:

| | | |
|---|---|---|
| A | Letter dated Dec. 18, 2006 | Jeff Hegedus (Environmental Health Supervisor) |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | RI | Cleanup levels | Concurrence with site cleanup levels | 4.2 |
| 3 | RI | BSL Basis | BSL as reasonable and justifiable | 4.3 |
| 4 | FS | Capping effectiveness | Support for capping as a technology | 5.2 |
| 5 | RI | Seafood quality | Absence of seafood advisory for mercury | 4.4 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

WHATCOM COUNTY
HEALTH DEPARTMENT

REGINA DELAHUNT
Director

GREG STERN, M.D.
Health Officer

December 18, 2006 #1-A

Lucille T. McInerney, P.E.
Site Manager
Washington State Department of Ecology
Northwest Regional Office
3190 160th Avenue
Bellevue, Washington 98008-5452

Subject: Whatcom Waterway Draft Supplemental RI/FS and Draft Supplemental EIS

Dear Ms. McInerney:

The Whatcom County Health Department (WCHD) has reviewed the Draft Supplemental
RI/FS and Draft Supplemental EIS for the Whatcom Waterway site, and concurs that the 1
preferred Remedial Alternative No. 6 is protective of human health and the environment.

The preferred remedial approach is in compliance with the requirements of Chapter 173-340
WAC, *Model Toxics Control Act Cleanup Requirements* and Chapter 173-204 WAC,
*Sediment Management Standards*. In particular, these regulations provide strict guidance on
establishing sediment cleanup levels that are protective of both ecological and human
receptors. These regulations, which are among the most well developed and progressive
cleanup standards in the country, have been adhered to in the development of the
documents, and in the selection of the preferred remedy. The preferred remedy correctly 2
uses sediment quality standards, cleanup screening levels and bioassay procedures, in
compliance with Chapter 173-204 WAC, to guide cleanup decisions. These requirements, in
addition to being law, are based on extensive scientific and legislative process, and provide a
sound basis to guide cleanup decisions. The derivation of the site-specific mercury
bioaccumulation screening level, although actually difficult to calculate, provides a
reasonable, justifiable estimate of a health-based sediment screening level. WCHD concurs 1
with the methodology used to develop this screening level. Regarding cleanup approaches,
WCHD recognizes that, as a component of the overall preferred remedy, capping is an 2
accepted, industry standard remedial technology that functions by eliminating exposure
pathway.

Currently, because it is an industrial urban embayment, WCHD recommends that fish and
shellfish not be harvested from the Whatcom Waterway. However, existing levels of mercury 3
in fish and shellfish tissue, as seen in the tissue sample data, have not warranted the
issuance of a shellfish consumption advisory for Bellingham Bay. The preferred remedy will
result in a reduction of these existing levels.

Thank you for your review and consideration of these comments.

Sincerely,

Jeff Hegedus, MS, REHS
Environmental Health Supervisor

Commenter No. Name / Organization
159 Wilcox, Ken

Commenter Submittals:
A E-mail dated Dec. 18, 2006

| Comment Number | Summary of Comment Doc. | General Topic | Specific Topic | Ecology Response (RS Section) |
|---|---|---|---|---|
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |
| 2 | FS | Capping costs | Costs of long-term cap monitoring | 5.11 |
| 3 | FS | Capping costs | Costs of cap maintenance & repairs | 5.12 |
| 4 | FS | Future sediment treatment | Favors upland storage & future treatment | 5.18 |
| 5 | EIS | Marina comments | Opposes development of new marina | 6.8 |
| 6 | EIS | Alternative ASB Uses | Favors habitat use of ASB area | 6.9 |
| 7 | FS | Additional habitat | Favors habitat use of ASB area | 5.22 |
| 8 | FS | Whale exposure risks | Concerns about whale-induced disturbance | 5.9 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: Ken Wilcox [mailto:ken_wilcox@comcast.net]
Sent: Monday, December 18, 2006 3:50 PM
To: McInerney, Lucy (ECY)
Subject: Comments on the RI/FS for Whatcom Waterway.

December 18, 2006

Lucille T. McInerney, P.E., Site Manager
Department of Ecology, Northwest Regional Office
3190 160th Avenue Bellevue, WA 98008-5452

Re: Comments on Whatcom Waterway RI/FS

Dear Ms. McInerney,

Thank you in advance for considering my comments on the Whatcom
Waterway

RI/FS.

I strongly support Alternative 7 and an aggressive cleanup, including 1
removal of contaminants from the Whatcom Waterway. Capping is NOT an
appropriate or reliable long-term solution to the health and recovery
of

this sensitive estuary. It will never be any cheaper or easier than it
is now to remove the majority of mercury and other contaminants from
these areas. While I realize some short-term disturbance is likely, it
is absolutely essential that we base our response to this difficult
challenge not on what it will cost us today, but what it will cost over
the long run, say fifty years or more, both economically and
ecologically.

It is ironic that at the same time we are told by the Governor that we
all need to embrace a major effort at cleaning up Puget Sound, our
leading environmental regulatory agency is seriously contemplating
throwing a veritable rug over one of the more contaminated estuaries in
the region--and one that our community greatly wants to restore.
Capping

will require enormous sums to be expended over the coming years and
decades to monitor and repair what shouldn't even be there. I think the 2
RI/FS fails to address these costs fairly and with a clear view of the
long term benefits that would derive from doing the job right to begin 1
with. Costs are only vaguely developed and over-simplified, as if the
current generation of citizens are the only ones who stand to benefit.
As this community changes over time and as development evolves along
the

waterfront, it will very likely become much more difficult and costly
to

re-do the clean-up at a later date.

Mercury in particular should be removed to a contained upland site so that as recovery technologies advance, there will be an opportunity to separate the mercury from these sediments and use or dispose of them responsibly. Left in place, it will be impossible or at least highly impractical to do so, especially as the area begins to develop more intensively. 2

I find much of the data and alternatives presented to be defined less by the need for a thorough clean-up and more by the Port of Bellingham's pre-ordained outcomes. The Port clearly prefers an overall clean-up strategy that will accommodate their own narrow view of future land and water uses in and around the waterway. Yet these uses are poorly defined and subject to much review and modification through other public processes. The alternatives fail to consider the likelihood that use and development circumstances will likely change considerably over time. 3

I am further opposed to conversion of the ASB into a marina, although I agree that the contaminated sediments should be removed here as well. #4-B Most of the area should instead be returned to the bay and restored to a healthy marine environment. 4

Incidentally, I have personally observed grey whales sounding within fifty yards or less from the inner waterway. I believe the RI/FS under-estimates the disturbance to capped or untreated areas that would result from periodic gray whale feeding activities near the shore--not 4 to mention the toxic effects that will be suffered by these and other marine organisms.

Thank you.

Ken Wilcox
3900 Fraser Street
Bellingham, WA 98229

Commenter No. | Name / Organization
---|---
160 | Wild, Scott

Commenter Submittals:

A E-mail dated Dec. 7, 2006

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | Specific remedy preferences | 5.1 & Table 5-1 |

**Notes:**

EIS Supplemental Environmental Impact Statement
FS Feasibility Study (Volume 2 of Supplemental RI/FS)
RI Remedial Investigation (Volume 1 of Supplemental RI/FS)
RS Responsiveness Summary (Narrative)

#1-A

-----Original Message-----
From: swild7@juno.com [mailto:swild7@juno.com]
Sent: Thursday, December 07, 2006 4:32 PM
To: McInerney, Lucy (ECY)
Subject: Whatcom Waterway

Dear Ms. McInerney;

I am writing as a Bellingham resident and voter to register my disapproval and chagrin at what I gather is the momentum toward a miminalist approach to cleanup efforts for the Whatcom Waterway and ASB.

I believe it would be negligently short-sighted and a great dis-service to future generations for us not to make major efforts to remove as much of the toxic sediments from these waters as we possibly can, now! 1

I urge the Department of Ecology to mandate Cleanup Alternative 7 which calls for removal of sediments from both the Waterway and the ASB. Not to do at least this much would, I believe, be environmentally dangerous and, in the long run, fiscally irresponsible.

Respectfull Yours,

Scott Wild

1242 St. Paul St.
Bellingham, WA 98229 USA
360-756-2180; swild7@juno.com

| Commenter No. | Name / Organization |
|---|---|
| 161 | Williams, Marilyn R. |

Commenter Submittals:

| | |
|---|---|
| A | E-mail dated Dec. 18, 2006 |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| | | | | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Future sediment treatment | Favors capping pending future treatment | 5.18 |
| | | | | |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

**From:** Marilyn Williams [mailto:marilyn_98225@yahoo.com]
**Sent:** Monday, December 18, 2006 11:09 AM
**To:** McInerney, Lucy (ECY)
**Subject:** Bellingham waterway cleanup

To Whom it may Concern:

This is a vote for capping the mercury in the Whatcom Creek waterway. Please, continue searching for new technology that will neutralize the mercury so that it is no longer a threat. 1

Capping is a responsible solution since it limits the threat of unintended release into other environments and the bay. Moving this City's pollution to another place is not fair to people that may become the recipients of our pollution. 2

Eventually, technology will provide a real solution to the situation, until then, capping is a practical and fair way of dealing with the problem.

Thank you for your time,
Marilyn R Williams
1715 F ST
Bellingham WA 98225
360.715.9400

Commenter No. | Name / Organization
---|---
162 | Williams, Richard & Fran

Commenter Submittals:

| | | |
|---|---|---|
| A | E-mail dated Dec. 6, 2006 | Richard & Fran Williams |
| B | Letter dated Dec. 18, 2006 | Richard & Fran Williams |

| Comment Number | Summary of Comment | | | Ecology Response (RS Section) |
|---|---|---|---|---|
| | Doc. | General Topic | Specific Topic | |
| 1 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 2 | FS | Remedy preferences | General remedy preferences | 5.1 & Table 5-2 |
| 3 | FS | Seismic stability | Concerns about earthquake effects on caps | 5.7 |
| 4 | FS | Wind & wave erosion | Concerns about storms & effects on caps | 5.3 |

**Notes:**

| | |
|---|---|
| EIS | Supplemental Environmental Impact Statement |
| FS | Feasibility Study (Volume 2 of Supplemental RI/FS) |
| RI | Remedial Investigation (Volume 1 of Supplemental RI/FS) |
| RS | Responsiveness Summary (Narrative) |

#1-A

From: Richard Williams [mailto:rsw@nas.com]
Sent: Wednesday, December 06, 2006 8:22 AM
To: McInerney, Lucy (ECY)
Cc: info@bbayf.org
Subject: G P site clean up!

Dear Ms Mcinemey,

Permanent.

Considering "time" and what that means, one only has to look over our greatest example of time, the Grand Canyon. At its depth, time has past 500 million years (give or take a few million).

Are these proposed G P site solutions then to last as long as the streams flow, the tides turn, the winds blow?

Please, clean up ALL the poisons at the G P site. 1

Thank you,

Richard Williams
Fran Williams

December 13, 2006

Hello Ms. Lucille McInerney,

My husband and I both would like to go on the record in support of a total clean-up of the Whatcom Waterway. 1

The mercury needs to be removed. Storms and earthquakes pose a real threat to us all if the mercury is capped. 2

We need to clean up the mess we made and leave a waterfront safe for our children. 3

We need to do this now!

GET THE MERCURY OUT OF WHATCOM WATERWAY.

Concerned citizens,

Frances & Richard Williams

Frances and Richard Williams
1531 Marine Drive
Bellingham, Wa. 98225

**RESPONSIVENESS SUMMARY**

APPENDIX B

**PUBLIC HEARING TRANSCRIPT**
**DRAFT WHATCOM WATERWAY RI/FS AND EIS**

**December 11, 2006**

**Bellingham Cruise Terminal**
**355 Harris Ave, Bellingham, Washington**

**Moderator**
Good Evening I'm Jerry Thielen and I'm the hearings officer for tonight's public hearing. Let the records show that it is now 6:42 p.m. on December 11, 2006. This public hearing is being held at the Bellingham Cruise Terminal at 355 Harris Ave, Bellingham, WA. The purpose of tonight's public hearing is to receive your comments on a couple of different documents; the draft Supplemental Remedial Investigation and Feasibility Study, volumes one and two and the draft Supplemental EIS, Environmental Impact Statement.

Notices of this meeting were made in a number of ways. Display ads in the Bellingham Herald, announcements made in the Bellingham Bay Foundation's Whatcom Waterway forum, e-mails sent to interested parties, as well as, personal phone calls. As you might remember this meeting had to be postponed from its original meeting based on weather issues that you all had up here in Bellingham.

We're going to address the folks who have signed up in the order in which you have entered the building today. I'm going to call the first name and then have the next person on deck so that you can be prepared to step forward to the microphone. State your name and any affiliation you might have. We did agree on the five minute limit. I have my trusty egg timer. I'll set that. I'll apologize now for giving you a verbal cue in case I interrupt you when you're taking a breath hopefully to let you know you have one minute left to wrap up your comments.

Again, if you have lengthy comments or detailed comments you can submit those to me tonight and I will get those into the record.

First up, and again I'm going to apologize for any mispronunciations. First we have Ryan Ferris. Ryan Ferris, he will be followed by Marian Beddill.

**Ryan Ferris**
Thanks for letting me give my testimony. I have entered some documents into the record, but these are nice color prints. I notice that some of the photocopies just are kind of flat. So these are color prints and they're clear. My name is Ryan Ferris. I live in the Columbia neighborhood and I have two major concerns about the waterway cleanup.

My concerns relate to the Cornwall Landfill but they also relate to the aeration pond cleanup.

In looking at statecancerprofiles.cancer.gov it's easy to see that Whatcom County has fairly high cancer rates. In fact, in recent trends we outstrip every other county for cancers under 20 years of age. So that means that age group is suffering higher cancers at an increasing rate.

So I think that the discussion about toxicity in the waterfront is important because we're going to create public infrastructure on an area which had high levels of toxicity.

My second concern is about radiological dumping in the waterfront. In your documents I didn't see, perhaps I didn't look hard enough any testing of radiological emissions or dumping in the waterfront. I'm concerned about this because I have a document from 1996 from Landau and Associates that seems to show levels of tritium and cesium 137 in the water table at the Cornwall Landfill. My question to you is will you be testing for radiological emissions and radiological dumping be part of the RIFS and the Model Toxics Process.?

**Moderator**
Thank you. Marian. Following Marian will be Hamilton Hayes.

**Marian Beddill**
Good evening and thank you. Marian Beddill, citizen and resident of Bellingham and environmental activist. I'm going to ask you a rhetorical question, which you can't answer now but I'll try to answer for you. Would the appropriate agencies, Department of Ecology or whoever grant a permit to an industry to discharge into these waterways in compliance with the Washington State Model Toxics Control Act and any other laws and regulations and rules the level of contamination which you observe in the bay today? Would that be permitted with a new industrial permit?

My rhetorical, presumptive answer is no, you would not. Thus it seems to me illogical and contrary to the spirit and the intent and the purpose of that act and other related documents. I can not condone the approval of leaving the mercury and the other contaminants in the bay as is currently being considered.

A major concern for me with my experience in hydrology and engineering is the movement of the soils and the response to hydrologic circumstances, in particular an earthquake, a tsunami. If they are given adequate consideration in your report, I didn't see it. I think there is a passing reference to it.

The fact of what would happen to the capping if it were built that way makes a mockery of your allegations that covering stuff is adequate.

On the financial side what I see is your trying to pinch pennies now and sets it up in a circumstance that does not avoid human health and other biological health impacts later and is likely to lead to higher expenses later in an additional recovery after something bad happens.

So my recommendation, please remove the maximum possible contaminants, mercury and other things. Dispose of it upland in the proper manner that you, the state, does know how to do. And a final recommendation is, run these meetings on time.

**Moderator**
Thank you. Hamilton Hayes. He is followed by John Servais.

**Hamilton Hayes**
My name is Hamilton Hayes I'm from the Puget neighborhood. You are from the government, with no disrespect personally, but as I get into my questions. I'm a little concerned about process. So my comment is a recommendation that the design process also be subject to public review. I know that you may consider some of us not to be technically astute. But our community does have a substantial number of scientists and people in the university environment and the engineering environment that are certain to provide good technical comments.

I think given the experiences of some of the government agencies recently about construction and hydraulics that this would be something that would be very appropriate for the agency to adopt as their procedure. Thanks.

**Moderator**
Thank you. Next we have John and then he is followed by Floyd Carper.

**John Servais**
I'm John Servais. I've got something that I'm going to read. It's going to take about 3 minutes or a little bit more.

I live down here in Happy Valley near Fairhaven. I have for many years. I first came to Bellingham from the Midwest 1967. I just want to say a couple things about my own involvement and the reason is because it's been so long. I'm so pleased to be at a public hearing which is on the record; it's a legal process with regards to our mercury pollution of Whatcom Waterway.

I've been involved with the issue of Whatcom Waterway contamination with mercury and other toxins since 1970 when I was on the Northwest Passage underground newspaper. My concerns were expressed in attempts to alert our community to the dangers of 1970's and 1980's. In the 1990's Georgia Pacific actually asked me to host a one day meeting with several of its top plant managers including the manager of the mercury plant or the chlorine plant. To answer their questions and try to explain why some of us citizens were so critical of GP. I did that. It was an interesting day.

A couple of years later Georgia Pacific invited me to join a citizen advisory group they formed to help them understand community concerns about the pulp and chlorine plants. I served on that committee for several years, quietly without mentioning it in public because it wouldn't have been appropriate. Not until it disbanded in about 2000.

Of the 15 or so people on that advisory group I was the only environmentalist and enjoyed many scathing comments about enviros from the other members. I was once referred to as representing the enemy. Department of Ecology was a friend.

I appreciate the chance to finally go on the record on this issue at a public hearing not a public meeting. My comments are very critical of the Department of Ecology, the Port of Bellingham, and the City of Bellingham.

As early as 1995 the Bellingham Bay Pilot project and I may have the year off by one year. Maybe it was 1996. Even then run by Lucy Pebles…Lucy McInerney was avoiding any factual and honest process as regards to the amounts of mercury in the Whatcom Waterway. I was critical then to Lucy. No tests were being taken, no core samples-- I wish I was the facing the audience but that's ok. No tests were being taken were the mercury was probably the most intense. The same can be said today in 2006. After 11 years of meetings the DOE is still hiding the truth.

I started this whole process of being concerned about the mercury contamination out here when I was in my 20's. Now I'm 65 years old and I'm on Social Security and I'm still concerned and we haven't made any progress. It's time that our government agencies start to work for our interests and not the industrial interests.

So simply put I have five points. Number 1 DOE has enabled Georgia Pacific to pollute our waterway and our air with mercury for over 30 years. DOE has enabled it. DOE has monitored our poisoning and has hidden the facts and the truth from us. Now DOE is pretending to try and learn what has happened. They need only look at their own records of over 30 years. The Bellingham DOE offices continue to hide its records from us citizens too.

No core samples have been taken that I have seen and I have looked carefully through the maps have been taken from the most likely hot spots in the Whatcom Water where the mercury is probably the most intense. This is a conscience effort on DOE, the Port and the City to hide the truth from us citizens.

We have a toxic waterfront, one that is probably causing us illnesses and killing us. There is evidence of radioactive sludge dumping with knowledge by DOE on the waterfront and in our county.

We may have a major toxic dump that is comparable to the worst in the United States right in our community. The low levels shown in the clean up proposals are deceptive deceptions by the Department of Ecology.

Three, the only acceptable solution is removal of these toxins from our waterfront. I've studied for many hours the reports that were made public when Georgia Pacific sold the land to the Port of Bellingham a couple of years ago.

With the pretend clean up and the capping procedures posed by the Port and DOE our waterfront will remain a dangerous place for people.

**Moderator**
Sir you have about a minute left.

**John Servais**
Thank you. We are being lied to by our government agencies. As a citizen I can only request to Governor Gregoire require DOE to make a complete study of the pollution of our waterfront, including area 3B that George referred to that you kind of ignored. A complete study of our complete waterfront in the Whatcom Waterway and present this honest and full report all of us citizens. The health and safety of our community and people require this.

Five, I know that report will tons of tons of mercury in our waterfront. I request…I demand that DOE require all toxins, all mercury to be removed from our waterfront and from Bellingham Bay and be deposited in a secure landfill far away from people.

You know, obviously I reject capping. It's unproven, it's unstable, it's a confusing thing. Obviously it's proposal number 8. Take it all away.

One last thing if I have a few seconds. In the terms of that dredging up a little bit for the main dock person, freight and what not. I was on the Port's dock committee a few years ago. If you do any dredging those docks are going to try to fall over into the waterway. To repair those docks you would have to drive pilings. To drive pilings you would disturb the mercury. So no way. Thank you.

**Moderator**
Floyd Carper. He is followed by Tip Johnson.

**Floyd Carper**
The main thing I have to say I've only lived here about 6 years or a little better in the Bellingham area. I lived in the Everett area for over 30 years and I know that during all this time they had problems down at Everett with hard metals and stuff and a lot of times we were advised not to fish because of it and they'd try to done a number of different things like I know they had problems down in the San Francisco area trying to cover up stuff and it has not worked like most people think it should. That's it, thank you.

**Moderator**
Thank you. Tip Johnson and he is followed by Mike Kimmich.

**Tip Johnson**
Tip Johnson, I live in the Happy Valley neighborhood and I too have been involved with Georgia Pacific for a long time and other environmental matters as well. I'm going to paraphrase my comments tonight because they're kind of long and just cut me off when you will.

I hinge around where is the missing mercury? I don't know how we can have a plan until we identify where the mercury is. We don't know if the 25 holes you guys punched which John says you didn't punch in the right place. We don't know if there are big puddles down there in the waterway or if there are maybe 500 or 600 tons of mercury working their way back to the bay from wherever they landed when they were volatilized from the plant downtown.

I don’t know how we can have a plan without that information. Let’s just step back. In 1959 scientists concluded that the tragic health effects in Minimata, Japan were due to mercury releases into the bay. In 1965, 6 years later, we started writing the permits for this plan. About, just a few years later in the mid to early 70s federal officials of the United States and Canada started removing 30 such facilities in the Great Lakes Basin because of elevated fish tissue levels in the Great Lakes.

This plant continued to operate for another 25 years. If you use industry standards for the amount of mercury generally used per pound of pulp produced or ton of pulp you’ll come up with a number roughly 600 tons of mercury. That correlates to the figure Dave Franklin, the former plant manager, gave me of 500 tons. Or 15 tons per year they had to add. So GP admits to maybe 20 tons in the bay.

Where is the rest of it? I mean I don’t know how we can have a plan without knowing where the rest of it is. Well a couple of hundred tons were probably vaporized from the cell house into the atmosphere downtown. They dumped contaminated sludge along the shores of Whatcom Creek, a popular fishing stream. They illegally buried 15 tons on their property. Untold quantities were roasted in the first mercury recovery unit. GP found it very effective at removing mercury, but admitted none of it was being recovered. DOE urged them to continue trying.

How much of that is downwind in the watershed? I’m going to cut to the chase here because we know that GP attended the infamous meetings of the Chemical Industry Association. Bill Moyers later exposed as a widespread conspiracy to avoid disposal regulations by packaging waste as products. For instance GP made a drilling mud for the oil industry. Now mercury hotspots appear around offshore platforms. They made a similar product for their forestry division as a dust suppressant for logging roads. We don’t know what was in it but we do know they accepted hazardous waste from Boeing and others as far away as Ketchikan.

Depending on the fate of that mercury, in my opinion, this plan is either very poorly conceived and seriously irresponsible of the public’s health by being least cost and do nothing. Or it’s a deliberate attempt to hide the problem and escape liability for an environmental health disaster.

I think I see that the plan hinges around two bogus theories, capping and natural recovery. Together with the missing mercury they provide a mask and shield to hide the effects of GP’s work and DOE’s regulation. Naturally, natural recovery just means it goes away. With mercury that’s not OK.

A clean cap is the shield that they hope will limit releases to rates and levels indistinguishable from relatively high levels of mercury entering the bay via the Nooksack River. Why are those levels so high? The cinnabar deposits that GP was fond of suggesting were the cause have really never been located. And if it really is the mercury that was spewed upwind coming back down then in that case it’s a mask. To continue wrongs of the past into the future and avoid the costs and liabilities and I think that is wrong.

Natural recovery is a problem. With mercury it doesn’t count, forget about it. Capping is unproven. Even if they’re successful they are going to fail because roots and burrows will penetrate, the populations recovering on the caps will become feeding targets, uptake and mixing will distribute the toxins. With mercury that's not OK.

**Moderator**
Sir, you have about a minute left.

**Tip Johnson**
Thank you. The success of Governor Gregoire's recently announced restoration of Puget Sound's nearshore habitat will increasingly rely upon treating urban runoff. Why would DOE entertain a proposal that eliminates our treatment capacity when they are likely to mandate additional treatment requirements? That doesn't make sense and will cost us plenty. Where will we replace that treatment capacity and where will industry treat their waste? Do we no longer need industry? Even clean industry needs water treatment.

In closing, I think this plan is born of a predisposition to accommodate the Port's land use. And you kept coming back to that point. And you guys are acting as a consultant to a developer essentially and that's not in the public's best interest. We can build a better marina, maintain our shipping capacity, safely deposit our contaminated sediments, retain treatment capacity for industry and urban runoff and protect our restoration efforts from future pollution. But we need to comprehensively integrate and prioritize these public interests and we need your help to do it, because the Port is not going to and I have even submitted a diagram of how I think it can be done alternatively so thank you.

**Moderator**
All right, thank you very much. This next name I'm sorry I'm a real tough time with. It looks like the last name is Mike? He is followed by Matt Paskus.

**Mike Kimmich**
I would like to qualify this by saying my name is Mike Kimmich and I have a business that is more or less at the head of Whatcom Waterway, about a block off. It's a marine related business. So I have a very vested interest in the marina. That said, we've all agreed that mercury is forever. It doesn't go away; it sits there and insidiously waits for something to happen. It's not rocket science to figure out that if you remove it, get it put away, get it out of the water, it's gone. We've all read the articles about the salmon that we have mercury contamination in now and everything coming in the sound and pregnant women shouldn't eat it more than once a week and that type of thing.

Well this is just more of the same. I think that the way it's looking the two alternatives capping in place. Since we all agree that mercury is forever it comes down to dollars, dollars and cents. I think the cost benefit analysis that was done should include long-term monitoring. You were talking about a 500 year event horizon for tsunami's, etc. Well I feel very strongly that the monitoring should be costed out over that same period of time. Whether it's 100 years or 500 years. Either that or it should be monitored until technology allows us to remove the hazard that's in the waterway at this point in time. I think it is irresponsible not to do that.

I have a concern that nowhere have I heard any kind of a monitoring schedule and a cost. You say it's built into the costs of the, the cost benefit analysis. But I would very much like to hear an actual hard figure, the number of times, every other year for the next ten years, and then maybe every three years.

Also I haven't heard anything about a trigger and I think strongly there should be some type of a trigger. If more than two or three tests show some type of an elevated level above our clean water standards there should be some very specific remedies written into the, what's it called, the Consent Decree. So that it's not a "well let's negotiate what's going to happen." It's "if this happens then this is going to happen." You don't put together a program and then try and negotiate out later when the dollars become enormous what you're going to do. So that's I think needs to be removed and if it isn't then at the very least the public should know exactly what it is going to cost to monitor it and over what time period. Because it doesn't go away, it's there forever. You don't bury a poison and then forget about it after ten years because it hasn't come up and bit you in the butt.

So, that's it.

**Moderator**
All right. Thank you very much. Matt's up next followed by Wendy Steffensen.

**Matt Paskus**
Hi, Matt Paskus, county resident. I just want to make sure all the parties involved make sure it's done right. As the Department of Ecology stated 50 percent of coverage. What that alternative, the final alternative we just want to make sure its not based off the number of slips and let's see and the cost because basically the cost is going to dictate how many slips are going to be purchased by or designed by the Port and I just want the reassurances from all these agencies that we are not held responsible as tax payers. As the Port mentioned this will be coming from grants and those grants are not assumed are coming from some kind of export fees or import fees I'm not an expert on it. The other side of it is it won't come from property taxes now we know the Port does accept property tax income but again they're assuring us that none of this is going to come from any of that income and that's it, thanks guys.

**Moderator**
All right thank you very much. Next we have Wendy and then she is followed by George Dyson.

**Wendy Steffensen**
Wendy Steffensen. North Sound Baykeeper with Re-sources. The North Sound Baykeeper has been involved in the Whatcom Waterway cleanup, looking at the documents, assessing what the best possible thing is to do since probably 96 or 97 and I've been on board for about the last four years. So we've been looking at this issue diligently and with that we have a position and I will briefly state the position.

We would like a full dredge removal of mercury in the water, in the Whatcom Waterway and the ASB and lagoon as well as at the GP Log Pond – where ever the mercury is above the minimum contamination level. We would also like upland disposal of that mercury contaminated sediment. We do not want the contamination put into the ASB because that's near the water.

We would like the ASB returned back to aquatic usage. Now I realize that is a huge order, that's a huge order. So with that said, I'll say that we realize there are some places where it's most important to actually remove the mercury. That's where it's basically hottest, where it's most hot and where it's actually easiest to get it out. So I would say we're looking at the GP Log Pond and the Inner Whatcom Waterway and the lagoon. We know that you can drive sheet pile in at the end of that Whatcom Waterway to isolate it, to minimize the short term risks through sediment dredging and that way we could actually remove the bulk of the mercury without having too much sediment resuspend and recontaminate the area.

In addition there is the southwest corner of the lagoon where there is a lot of erosion occurring. That spot really needs to be addressed as well, because we're potentially going to have mercury dispersal from that site as well.

Two sites that we have concern about but I found very little data about are the head of the Whatcom Waterway. I actually only find one sample taken there and so in order to kind of assuage the concerns of the community I think we really need to take a second look at the head of the Whatcom Waterway as well as at Star Rock. I have not seen any detailed information on what the subsurface at Star Rock looks like. All I see in the latest RIFS is that Star Rock area passes in terms of surface sediments.

So that's kind of the North Sound Bay Keeper position in a nutshell. I have some more detailed comments that go with this and I also have handouts if anyone is interested later. So the biggest question for our, for the RIFS is do we dredge or do we cap? I actually had for a small piece of money a consultant take a look at Volume 2 of the RIFS because dredging and capping is not exactly my bailiwick. So I said take a look at this and Environmental International came back with basically the comment that said as we have all said they have confirmed that this RIFS really looks like it is written with a solution in mind. Basically the document is written to the solution and they also said that in addition the capping and dredging analysis was very obviously it was slanted the document said yes we can do capping and these are all the very good reasons we can do capping and kind of the dredging argument was given short shrift.

**Moderator**
You have about a minute left.

**Wendy Steffensen**
Ok I've got a lot more to say. So what I will say about what we haven't looked at in terms of capping is capping does not work in areas that are steep and that have pilings and structures and that is part of the reason why we have the Log Pond failure. The Whatcom Waterway is going to present a similar situation and that hasn't been addressed. So in your response to comments when you're looking at capping and dredging, please look at piece by piece why would capping work here why would dredging work here? Let's not give an answer that would, that is the cheapest answer and that will answer these land use questions. Let's give the answer that makes the most

sense from a technical and protective viewpoint and I'll stop here even though I have a lot more to say. Thank you.

**Moderator**
You can submit those to us in writing. We will take those either tonight or at some other time. Next up we have George Dyson. George Dyson and he will be followed by Murphy Evans.

**George Dyson**
Thank you very much. It is great to finally be here after so many years of watching this process unfold. George Dyson 435 W Holly St. That's actually lot number 1 on the waterfront lots. So I'm right there at ground zero. I've been waiting for this clean up for a long time. Just a disclosure, I'm on the board of the Bellingham Bay Foundation and also I'm the wait list for the marina for a slip. So I've got all the bases covered. I already made my comment that none of these plans show any cleanup at the head of the waterway. I would like to put that on the record again. I think that is absolutely essential. I don't want my kids going down there until something happens.

At this stage, I think we should be arguing about how to do the cleanup not whether to do the cleanup. I think it should just be a given that we're going to remove the maximum practical amount of mercury we should be arguing about how to physically do that. I'm sorry to see us still arguing about whether you know capping versus dredging.

I think ultimately this is cost benefit analysis. This is an economic issue and I really have not seen the proper spreadsheet that really puts the cost on both sides. We've seen the cost of dredging. We haven't really seen the cost of not cleaning up, the long term costs are going to come back to haunt us the drop in property values from being seen as being a contaminated area. The legal and litigation that is undoubtedly going to happen over the years if we leave that stuff in place. And of course the cost of monitoring is very expensive. In some ways this is sort of social issue in that the costs for actually cleaning up are sort of blue collar jobs, it's dredging and railroad trains and disposal and the costs of monitoring forever are very expensive. Consultants who are going to be doing this until their children all have PhD's and become consultants themselves.

The data I think is very poor. I've looked at the documents very closely. The sampling grid is amazingly sparse given the expensive decisions that have to be made. I think we really need to take a much closer look at where the contamination is. That data is sparse not only in space but also in time. Twenty five samples over years just doesn't make it. It's a very complex area. Bellingham Bay is sort of a heterogeneous area but the waterway is very different. We have the currents coming out and coming in. We've got boat traffic, things like that. Also, unless I'm mistaken, I've seen no data on actual sedimentation rates within the waterway. And we're basing a lot of this on the assumption that it's going to continue sedimentation.

I think standards may change. We were having this discussion 30 years ago while mercury was fine. We saw it with lead and gasoline was an acceptable thing at one time. It's completely unacceptable now. I think 20 years from now we may simply tolerate no mercury in our environment. It’s not something that...It’s likely the levels will go to zero rather than become looser and that’s going to be a very difficult problem if we leave all that stuff in place.

We’ve also seen, as far as I can tell, no look at the microbiology. We’re looking at our bioassays or crabs and other benthic organisms. It really, where the rubber hits the road is microorganisms that actually metabolize and are the first step in getting the mercury into the food chain. We really should be looking at that for a complete study.

The bottom line really, I’ve been watching this process we had a plan earlier that really did clean up the waterway now we don’t. We know we’ve seen a very clear plan to have a clean ocean marina. The Whatcom Waterway was Bellingham’s original marina and we could easily have a clean ocean waterway. My question is why not?

My final comment is I think any plan we have should pass what I would call sort of the private development test. If Georgia Pacific had sold the property to an out of town private developer and they were presenting us with this clean up plan what our reaction be. I think our reaction would be very unfavorable. Sort of smoke and mirrors here. The developers are getting the marina and the community is not getting the clean up that they we deserve and we should insist on.

Thank you very much.

**Moderator**
Thank you. Murphy Evans and he is followed by Mike Muckay.

**Murphy Evans**
Murphy Evans, 1545 Marine Drive. Like George I’m a member of the Bellingham Bay Foundation. I have four basic comments on the DOE’s cost benefit analysis.

My first comment is I think the raw estimates that the DOE uses to characterize the 8 different plans are really the wrong numbers. That should be evaluated in terms of a cost benefit analysis. I think the numbers the DOE should be looking at are the actual cost to the public. Not the estimated costs of the clean up plan. When the Port purchased this property for ten dollars it took on the environmental liabilities, including the liabilities associated with the Whatcom Waterway. In planning for that liability it paid approximately $29 million for insurance coverage. So they’ve spent that money. That money has been spent and the insurance coverage has been purchased. So the benefit of that to the public should be going in to the cost benefit analysis that the Department of Ecology looks at. So when it looks at each of the 8 different proposed plans it should take out the portion that the insurance coverage will be paying because that is not going to be a cost to the public. That cost has already been incurred by the public when the insurance was purchased.

Secondly, there has been a promise of MTCA state grants on a 1 to 1 basis as I understand it up to $25 million. It is my understanding that those grant monies have already been collected. So that benefit should be included in and taken out of the costs of these various alternatives so that we should come up with what is the additional cost to the public after insurance is taken into account and after the promised state funds are taken into account.

The second flaw that I see in the cost benefit analysis is I understand it there is a long-term monitoring number built into the RIFS. But the number is the same for virtually every proposal. I think it's about $640,000 for each of these proposals. But I think the long-term monitoring requirements are quite different for each proposal. Obviously if the mercury is taken out of the site or most of it is taken away. The need for long-term monitoring is much less than if the mercury remains in place for years to come.

So instead of having one ballpark number for each of the plans the long-term monitoring costs need to be fine-tuned and taken into account whether the actual likely risks and the monitoring to take those risks into account.

The third area that I think is flawed in the present cost benefit analysis is the failure contingency. Probably the best and this is the risk of failure and cost of dealing with that contingency. We have an example of what that failure might cost here in this exact location. The Log Pond remediation plan that was implemented by Georgia Pacific in 2000. We don't know what the cost of it is but it's our guess that it's somewhere between $1 and $1.5 million. They did a cap-in in place there. The current RIFS has an estimate for fixing the Log Pond where the erosion has take place of approximately somewhere around $700,000. So there's in 5 years there's been a failure at this site in this exact location. The same location that alternatives 5 and 6 plan to cap, and the cost is somewhere around half of what the original capping of the Log Pond was. There needs to be that failure contingency the cost of fixing the cap needs to be built into the cost benefit analysis. I think the risk of failure and the cost of that failure is much greater in alternatives 5 and 6 then in the alternatives that remove the mercury. Because the mercury is not going to be there and the risk is much less.

My final area of comment about the current cost benefit analysis is the dredging profiles that we used in alternatives 3 and 7. I asked about this during the question and answer period and my impression is that the dredging profiles for alternatives 3 and alternative 7 are identical to the dredging profiles that were adopted by Georgia Pacific as part of the RIFS that led to their alternative J.

As I understand the process Georgia Pacific was required by the Port of Bellingham to dredge, deep dredge, the whole channel because the Port said we want this to be a federal navigable waterway so you have to dredge to that length of the channel, irrespective of where the contamination was. Alternatives 3 and 7 carry that profile forward even though now the Port of Bellingham is saying we want to decommission the waterway, we don't need it to be that depth. In fact my understanding is alternative 7 gets marked down because it dredges in areas that may compromise the shoreline. Why are we using that as the profile for that alternative? What instead should be used as the dredging profile is where the contamination is. My concern is that given the present core sampling that has been done we don't have a very clear picture of where that dredging is. So I think more core samples need to be made so that we can identify where the dirty stuff is instead of taking out 300,000 cubic yards of sediment. More is taken out in 7 than in 6. Well a lot of that is clean we don't need to remove that and take it to an upland site. It's clean.

We just need to take the dirty stuff away. I think the costs of alternatives 3 and 7 would go down if we only targeted where the dirty stuff and not get it back down to the federal navigable waterway.

**Moderator**
Thank you very much. Mike Mackay I believe and he is followed by Elizabeth Kilanowski.

**Mike Mackay**
My name is Mike Mackay. I'm a fisheries biologist. I work with the Lummi Indian Nation, but I won't be speaking on their behalf tonight. I'm just going to be talking as a citizen. I live in Bellingham. I've been following this process for quite sometime actually was on the action team that Lucy is a member of and was on a meeting group that preceded that action team. So I have a background that goes back quite a ways.

So I'm going to just read off some of my written comments and if there is any time left I would just like talk a little bit about power point presentation that I hoped to give tonight. It has figures that might be interesting to some of you from a perspective that we're not used to hearing about in these documents and that's the one from the organisms that live in the Whatcom Waterway and the Log Pond – the fish, the crabs, the marine resources that we're concerned with when we're talking about mercury and bioaccumulation.

OK, so some of my comments tonight I would like to say that I have reviewed these documents and find that none of the alternatives offered provide a suitable strategy for sediment clean up which protect human health or minimizes harm to the marine environment to a significant level. I will therefore provide some comments and recommendations for your consideration and actually I'll provide written comments too for the deadline.

I believe that the overriding goal in sediment clean up must be to reduce mercury exposure to marine organisms so that we can avoid the negative consequences of bioaccumulation in populations that are most at risk. Because of the higher seafood consumption rates at risk populations include our neighbors the indigenous people and the orca whales.

Mercury poisoning is not an insignificant matter.  When it occurs it affects the very young by interfering with proper development of the brain and nervous system   Children who have been exposed to high levels of mercury suffer with learning disabilities and distorted vision.  These problems affect them their entire life.  We can only imagine what the consequences are for marine organisms but they're similar other studies have found.  For example fish become disorientated and do not have the ability to migrate successfully when exposed to levels of mercury.

Mercury poisoning may not be as rare as you might think. A recent medical journal, and this is the AMA – Journal of the American Medical Association, volume 289, number 13, April 2nd 03. It states that samples from 8 percent of pregnant women in their sample group, and it was several hundred samples I believe, found that the levels of mercury in these women's blood was at a level that was high enough to cause harm to their unborn fetuses.

This is a national sort of study, but it does illustrate some of the problems that are real problems that we need to – there is a reason we're trying to clean up sediment in Bellingham Bay. We just can't forget that. To accomplish a significant reduction of exposure risk to mercury would require some of the most highly contaminated sediments be physically removed from the waterway.

I can't believe over the 15 years or so that I have followed these processes with Ecology that we have not yet arrived to a place where serious consideration is being given to remove one cubic yard of sediment, contaminated sediment, out of the Whatcom Waterway or Log Pond area. I just can't believe that isn't seriously considered as an alternative.

Unfortunately these documents drafted by the Port's consultants and approved by Ecology suggest clean up measures that rely heavily on sediment capping and natural recovery. They allow contaminated sediments to pass the state's minimum clean up level using a flawed evaluation process that uses other types of biological tests which were not intended to evaluate mercury bioaccumulation risk. So it's a very major flaw in this whole design in terms of screening sediments. They use tests to eliminate further clean up using tests that don't look at the bioaccumulation risk. They're designed for other sorts of measures of toxicity.

**Moderator**
Sir you have about a minute left please.

**Mike Mackay**
OK. Capping contaminated sediments with clean material is a legitimate way to reduce exposure in areas where mercury exists in low concentrations. Capping is not appropriate where mercury levels in the sediments are high. This is because there are significant unacceptable risks that the cap will leak. Even if the cap were to initially seal the contamination ensuring 100 percent effectiveness in the cap over the long term is not presently feasible. Given the expected level of monitoring suggested by these documents.

You know. If George is somewhat alarmed by the sampling grid being sparse as referred to the sampling of sediments, you ought to look at the biological data. You know there is just nothing there to base some of the human health risks analyses they've created in these documents. It's all about sample size and good science and non-biased science and I just don't think we have it in these documents. We ought to scrutinize the human health risk analysis much further. I have several specific comments and I'm sure others do too concerning that very important part of these documents.

We are fortunate that the configuration of the shoreline along the waterway lends itself to isolating pockets of contamination for removal. There is within the Log Pond and the upper waterway the most contaminated areas can be confined using sheet pile to dewater and remove these sediments. The ASB pond could also be used for dewatering sediments prior to transport.

**Moderator**
If you could summarize please.

**Mike Mackay**
A plan that does not include the removal of the most highly contaminated sediments is not a clean up plan it's a sweep it under the rug plan and should be rejected. Thank you.

**Moderator**
Thank you very much. Elizabeth is up next and she is followed by Stan Parker.

**Elizabeth Kilanowski**
I'm Elizabeth Kilanowski. I'm a geologist. In my opinion seismic events, liquefaction and storm surge haven't been adequately addressed in the RIFS. When an earth quake wave passes through the type of sediments in the Whatcom Waterway those sediments can lose their cohesion and begin to liquefy causing resuspension of contaminants and woody debris. Liquefaction may be accompanied by sand volcano's which eject materials to the surface and can reach sediment caps.

Seismic events which can lead to liquefaction and sand volcanoes are best addressed before an alternative is chosen. The alternative selected for the waterway, either capping or dredging, could be changed by information obtained from a comprehensive seismic study. The question of liquefaction should also be addressed early on in documents associated with the Chlor-alkali upland site.

While much progress has been made in the past 10 years identifying sites susceptible to liquefaction and on engineering solutions for structures constructed on those sites. Much is still unknown. Citizens should be made aware of the high cost associated with building in seismically sensitive areas.

In section 3.2 of the EIS, the statement that quote "no major fault lines exist in the study area" quote is misleading in that little work has been done in the past to identify this area's faults. At this time the Seismic Hazard Investigation of Puget Sound, called SHIPS as an acronym, project is in the process of mapping faults in the Northern Puget Sound and the Georgia Basin. This study is being conducted by the U.S.G.S an organization from Canada and has been ongoing since 1998. Several documents are available about the studies.

I'm making more expansive written comments on the lack of seismic information in the RIFS and I'll be passing those along.

In section 3.2 of the EIS, storm surge is called rare. What is rare? One storm a year, a decade, or every 50 years? Anecdotal evidence indicates one or two serious storms in this area each year. For example the February 4, 2006 storm and the November 15, 2006 storm both of which had significant storm surge associated with them. This is a picture right here that I took in the Blaine Harbor docks of the Blaine Harbor Docks, on February 4, 2006. The pilings are very nearly topped. They have less than a foot to go. We had a high tide and a storm. There was a significant storm surge.

This is part of the Blaine Marina that was recently dredged and the new pilings are added there. These are brand new pilings. A higher tide or a seismic event coupled with a storm surge like this could have set the docks floating free. If you could imagine what a bunch of docks would look like with boats attached to them and floating free. It's a little bit scary.

On November 15 of this year a line of eel grass ten feet or so inland from the edge of the beach marked the high water mark – Boulevard Park. Storm surge is not just about water levels rising, however. There is nothing in this report about currents that are associated with storm events that can cause cap and bottom erosion.

Every year unexpected storm surge in our area seems to be showing us inadequacies in our previous waterfront engineering.

Lastly I want to thank the Department of Ecology very much for hosting this public hearing at the request of local citizens. I think it's a very important process. It gives citizens a chance to comment and to hear the comments of others. So thank you.

**Moderator**
Thank you. Next we have Stan Parker and he will be followed by Niki Thane.

**Stan Parker**
Stan Parker, Columbia Neighborhood. Right now the Bay's got a lot of mercury in it. That mercury is there on your watch, you guys permitted it and the main reason for that is 40 years ago, the environmental laws were very lax. 50 to 60 years ago they didn't exist. We don't know what those laws will be like 50 to 60 years from now. There's a good chance they will be a lot more stringent and thresholds will be a lot tighter.

If you do cap it and your cap is successful by today's standards and you monitor it and you go out 50 years from now and take a core sample and monitor it and it meets the standards you're saying now but it doesn't meet the new standards we have 50 years from now, now you're in a dilemma. I mean you have a good opportunity right now because the whole GP site is barren and you can clean it up and you can dredge. If the City gets its way and the whole area is covered with 20 story high rises, it's going to be very difficult to go back 50 years from now and clean it up to a higher standard.

This is a great opportunity to do a good job and I think capping is the wrong way to go just because you don't know what is going to be here 20, 50 100 years from now. You've done some capping in Puget Sound and it works you have a good track record, but your track record is 20 or 30 years. You don't have a track record of 200 to 300 years for capping and the mercury is going to be there forever and we just don't know. What you know is it might last for 20 years, you don't know if it going to last for 200 and the only thing to do is get rid of as much as you can.

**Moderator**
Thank you. Niki Thane. She is followed by Anna Evans.

**Niki Thane**
My name is Niki Thane and I'm a resident of the Lettered Streets Neighborhood. I'm not very eloquent so I just wanted to say one short thing. There has been a lot of talk tonight about costs, cost analysis, cost savings, escaping costs one person said. I think that the difference between the full dredge alternative which the latest speaker just said is sort of over-estimating the cost of truly dredging the contaminated sediment rather then just dredging all of the sediment. I think that the difference in cost of $30 million between alternatives 5 and 6 and the full dredge alternative is really chump change. $30 million is a very small amount for the benefits of removing the sediments so it is no longer in the water table and more susceptible to being moved around.

I don't know if you know, being not from the Bellingham area but the Bellingham residents just voted a $44 million tax on ourselves for a greenways levy and I think it would be just as likely the citizens of Bellingham would just as likely, additionally add a $30 million tax on themselves to have this mercury removed rather than left in place. Thank you.

**Moderator**
Thank you. Anna Evans, and she is followed by I think it is Sharon. Sharon I can't read your last name.

**Anna Evans**
Hi there, I'm Anna Evans. 1545 Marine Drive. I'm also the acting director of the Bellingham Bay Foundation. I would just like to reiterate the thank you to the Department of Ecology for hosting this event tonight. I think it is very important and necessary that we're here.

I would also like to comment because of the reschedule. Unfortunately this meeting tonight conflicts with two other very high profile community meetings and I know there are a lot of concerned citizens who had to make a difficult choice this evening about where to be. So I think that those of us who are here really shows our commitment to this cause.

I would like to bring some information to this discussion that might suggest the ways in which the voices of those other concerned citizens might support and reiterate what we're hearing here tonight.

I would like to speak to the MTCA rankings of the various alternatives. We know that public concern is one of the elements that you all pay attention to when you're ranking various alternatives. We don't know much about how you determine those public concerns other than the land use changes that have gotten a lot of publicity.

The Bellingham Bay Foundation in an attempt to assess public concerns commissioned two polls last Spring – in April of 2006 we contracted with Stuart Elway in Seattle,, conducted a poll here in Whatcom County added 3 questions on to his regular monthly poll. This poll had an error ratio of 6.2 percent I believe. And in the question "What most concerned citizens about the Whatcom Waterway cleanup" Three to 1 people chose making sure that contaminates are safely disposed of as their principle concern about the Whatcom Waterway cleanup.

That poll was followed up in June by a more detailed, extensive survey that had an error rate of 3 percent. That was conducted by Applied Research Northwest here in Bellingham. In that survey 81 percent of local residents said that a thorough cleanup was their primary concern for the Whatcom Waterway project.

They're sure all the things that are happening down there are very exciting but first and foremost people wanted to see that there was a thorough cleanup

Those folks were asked if a thorough cleanup were more expensive, found to be more expensive to remove mercury rather than to leave it in place that was one of the questions, would that change their opinion and 75 percent said no, they would be willing to pay more for a more thorough cleanup of the Whatcom Waterway and the Georgia Pacific site.

So I will submit those surveys as part of the written record for you all to look at more closely. I would just like to emphasize again that this issue can't be more important and I think it's clear that the residents of this town and this county really want to see this mercury removed from our natural environment, not just buried in place. Thank you very much.

**Moderator**
Thank you. Commenting on your comment about those who weren't able to make it because of the other conflicts. Again, they still have an opportunity to submit written comments by the close of the deadline. Those comments, those written comments, carry the same weight as if they were here. So I would encourage you to encourage your friends to submit those comments to us.

Sharon. She is followed by Frances Badgett.

**Sharon Crozier**
My name is Sharon Crozier, I live in the Birchwood Neighborhood in Bellingham. Reasonableness and accommodation are social requirements if we are going to get along and accomplish things. But therein also lies mediocrity of vastation and irresponsibility. We have the reasonable cost of this. The reasonable cost of this plan for the return is designed not suit the cleanest solution for the people that it is supposed to serve.

The reasonable timeline, that is another thing nice about this plan. Well I think when it comes to cleaning up our waterfront those of us who already have untold pollution in our drinking water care as much about this as we do about our drinking water. You'll find us really, really patient if you want to do it right. I don't feel frankly real hopeful tonight. People in this day and age often go before their governmental entities and agencies and elected officials and usually what we find is, what a woman before me said, which is it's written to the plan.

The plan may have some changes, a few more testing sites, but in my heart I don't have a lot of hope. We have never in my knowledge had an environmental impact statement required by Ecology down here. Things have gone rampant and accepted. The most recent one I can think of, as far as this portion of the waterfront, more recently on the south side, but on this portion of the waterfront there was the Cogen plant that somehow everybody decided didn't matter even though it was processing all that water through that area

I have here a statement that was given to one of a group of people who have been working on this for some time. It was given to us by a GP employee who actually passed it off in a restroom in a building she was so afraid of losing her job over it. This is actually in the EPA's toxic release data base. As far as I know nothing has ever been commented about it and it's been ignored completely.

One of the many key reports missing on the handling and release of toxic compounds into the waterway by GP is that of chromium. GP admits to having up to 10 million pounds of chromium compounds on site and admits to releasing 8600 pounds of extremely toxic chromium compounds to the bay in one year, in 1995. That's one year.

This information is gathered by the EPA and is surprisingly omitted by Ecology and the Port. This information was obtained GP employee as I told you. The report has toxins including mercury, ammonia, chromium, and fluoride. For 1996, over 1.4 million pounds of waste dumped into the air and water at this site in one year, over 3800 pounds per day. This is what GP admits to. All of this contamination should be cleaned up now and not left to future generations. Frankly those who dumped it are covering up this information and should be prosecuted for poisoning the city and the bay and I would personally implicate people who allowed it.

Breaking an investigation into separate issues is a shell game. Not doing Cornwall why you're doing this one and not doing, just segments it ignores the synergistic effect of all the areas and how they compound each other and it's so easy to lose sight of a source if it's not in that. But it might not be in that. It just doesn't seem, it seems like a rush to me, a rush to judgment. This is followed by how the plan, you saw a drawing on the plan. There is scarcely any space in that drawing. It's buildings all the way because the study group, the citizens study group said yes, mixed use would be nice, yeah that would be OK. What the plan they came up with was designed much after Everett and there's not much open space there.

**Moderator**
About a minute left please.

**Sharon Crozier**
Thank you.

The 100 to 500 year event idea is grandiose hope. The capping plan ignores leachate, intrusions and other things people have said. It's just I want to add that it's a bad idea. Much has been said about the jobs resulting from this locally. Well we don't need the 30 pieces of silver.

Consent agreement is based on short term concerns and a quick, cheap fix. Who will benefit from this other than the people who want to further exploit our port area?

The DOE, Georgia Pacific and the Port of Bellingham should be held responsible for the damage they have allowed. The idea of taxing ourselves certainly is not repugnant if that is our only choice, but it's not right.

This plan could never be allowed to be brought to a vote of the people because we know how that would go. If you know that's how people feel, and that they're coming from thoughtful, informed and educated testimony here tonight, not necessarily. To ignore that and continue with the plan that has no vision for the future. No vision for a sustainable, healthy waterfront – would be frankly neglectful and I think criminal. If you see how strongly I feel we'll just have to know we've been thinking about this for along time.

What's good for business is not necessarily good for us. In fact, more and more just the opposite is true. And I'm a business owner.

Thank you.

**Moderator**
Thank you.  Frances is up next. Then we'll have Kevin Cournoyer.

**Frances Badgett**
Frances Badgett, 2514 West St. I want to play off something Elizabeth Kilanowski said. That storms surge is called rare. This is a problem I found throughout this document. I think one of the challenges Ecology has right now is to get this community confident in whatever you choose. Whatever plan you chose, we're all going to be on board, and we're going to feel protected.

One way of doing that is to make the language of the RIFS more certain. There is a lot of stuff in there about "is likely to" "is expected to" is sort of "going to." I know part of the reason for capping is that benthic organisms don't seem to be uptaking the mercury as much as they should given that there is so much out there. But this particular kind of sliding around of language and using a lot of adverbs gets really dangerous when you start talking about increases in toxicity at the Log Pond cap for example, the increases in mercury there. And how well we understand the processes of the Bay and how much these benthic organisms uptake or don't should determine the protectiveness?

So when we're talking about, we're kind of hinging our future on natural recovery which is expected to continue and the sedimentation of the Nooksack which is likely to continue.

We don't really understand it and we're basing this kind of hopeful future on this scenario that we don't understand. We don't know why natural recovery happens and we don't know why the Bay is inherently protective

For that reason we should be favoring removal because what is causing that protectiveness could change, it might have something to do with the salinity of the ocean, it might have temperature, it might be something that could change because of global warming, we don't know.  So for that reason we have this risk out there. As for there is another problem I think the community keeps harping on. Which is that we're remediating the water first and the land second and  I know that you've said that – with the closing of the Chlor-Alkali plant, with the closing of GP that the land is not likely to recontaminate the waterway. But other than saying that in this document we don't get a report, we don't get a sense of how that is happening or not happening. We don't see the city stormwater report, but it's mentioned. So we don't have any confidence that that's really true. Given that in other areas of Puget Sound where millions of dollars have been spent on cleaning up the caps that did recontaminate from stormwater. We should probably look into that.

Also, I have a question about the fact that there was no document that is a human health risk assessment. A separate document performed for the Whatcom Waterway. That seems to be problematic. I was reading about EPA human health risk assessments and they typically evaluate potential risk from facilities over long periods of times, greater than 30 years. Which is far longer than the ten years slated for the Log Pond for example.

Alternative J had very specific cost estimates and break downs in the old RIFS. There were actual costs per cubic yard for dredging, costs per cubic yard for capping. I have not seen that here. I have not seen a breakdown spreadsheet of the costs for different actions and I think that would be a good thing to add.

In closing, I think it's odd and I don't know why this is true that there are 4 alternatives in RIFS that will not be seriously considered because they conflict with land use because they do not include a marina and I'm not sure why we didn't get eight full alternatives that would have included all the possibilities with a marina If you're going to knock anything off that didn't include a marina automatically. That's all I'm going to say, Thank you.

**Moderator**
All right, thank you. Kevin, he is followed by Dan David.

**Kevin Cournoyer**
Hi, my name is Kevin Cournoyer. I have a lot more comments than I have time for which I'll submit separately. Briefly I would like to make note of the fact that a member of Ecology recently made a comment to KGMI radio that said that this review process that we're undergoing right now is not really for the public to pick the best alternative. The suggestion that Ecology seemed to be making was that Ecology has already done that.

In effect that the public needs to check Ecology's homework. I daren't say I disagree with that. I don't think Ecology has picked the best plan. I believe if Ecology picks either 5 or 6 they really shouldn't be involved in this process. It would be horrible.

There are 8 alternatives, 4 of them cap the ASB. If Ecology didn't want to consider them they shouldn't be in the document. I hope those alternatives aren't there to humor us or to suggest that the Port of Bellingham is in anyway objective or fair minded. Because having observed them for years they are neither of those things.

I was going to talk a lot about the definition of land ownership and I've got in an argument with Mike about that in this very room, but the truth of the matter is that the Port is a public entity. I'll briefly quote their mission statement "The Port pledges to work cooperatively with other entities within the framework of community standards and be a responsible trustee of publicly owned assets." So when we talk about a public hearing we're really talking about an owners hearing.

Very quickly, aquatic vs. upland. For years both the City and the Port officials have explicitly and implicitly defined the ASB as aquatic lands. It is not, but they have tried mightily to convince the public of this. Frank Chmelik, the Port's lawyer, has even made this assertion in legal papers in a lawsuit against Citizens for a Healthy Bay. He said basically that Mark Asmundson wrote a letter that somehow makes the ASB aquatic. That is possibly perjurous. The argument that Mr. Asmundson has the authority to define the status of the ASB with a letter is about as compelling as his ability to chose a city logo. Where still there is this assumption the ASB is aquatic is laced throughout the RIFS and the EIS is stated pretty explicitly in 6-21 of the FS.

On March 16 of this year, an official with Ecology, based locally spoke before the city planning commission and he said the following, quote "Under the shoreline act we consider the ASB filled even though it is a lagoon. It is a wastewater treatment plant, much like a sewage treatment plant. It is not a water body of the state. It is upland."

The next day the Port attempted to get this Ecology official in serious trouble for speaking the truth. Even the governor of the state, Christine Gregoire, was dragged into this nonsense. If you don't believe me ask her. Why was the statement so alarming to the Port of Bellingham? There has not been any permitting, anything whatsoever that has changed the status of this ASB.

The incontrovertible truth that it is still an upland site. Wishing it otherwise will not make it so. So again, why is this so important to the Port? Now that the public has been able to read hundreds of pages of this RIFS we understand why.

First it is important to remember that things Pete Adolphson said about SQS and mercury and sediments in the aquatic environment. It is .41 mg/kg and the upland environment it is 24. The ASB has an average of 6 milligrams per kilogram of mercury, according to MTCA that is considered quite safe.

**Moderator**
You've got about a minute left sir.

**Kevin Cournoyer**
So what does that mean in the RIFS? It means that all the unfavorable comparisons between the inner water way and the ASB regarding mercury levels are completely erroneous, disingenuous at best.

Over and over again the Port tries mightily to convey the impression that the ASB is extremely high levels of mercury that is flat wrong. The problem, and none of this has been substantiated, I would like to echo what Murphy said regarding dredging depth. I don't think we have enough good data on the dredging depth. I think you should be focusing on the removal of contaminants and not at the federal depth.

I need to end with item 11 from the purchase of sale agreement between the Port and Georgia Pacific. It says among other things, either Georgia Pacific nor the Port shall publicly or privately, directly or indirectly advance, promote or attempt to influence any of the remediation plans for the Whatcom Waterway site other than alternative K. Alternative K basically has been reified as Alt 5 and 6.

So there it is, at this point this great process of ultimately reifying Alternative K as Alternatives 5 and 6 is working

With the Department of Ecology so far willing to bend to the Port's will even though they have the authority to do otherwise. If you look at item 11 and you think about the fact that Mr. Stoner is a Port employee it boggles the mind that he is the SEPA lead. He shouldn't be. He is practically compelled to dissemble, and he has, over and over again to achieve the outcome that was set in motion years ago. All of the pleas of thousand of members of this public and the healthy bay initiative have been ignored.

I encourage you to listen to these cries of help basically. In so many ways you have not done the right thing. So I encourage you to listen to all the people who have been silenced by the lawsuit. Who have been silenced, 6400 voices. Listen to Mr. Miles, Pat Hurbin, Rebecca Reeseman, to Rodd Pemble. Listen to Frances Badgett. Thank you.

**Moderator**
Thank you. Dan David and he is followed by Steve Irving.

**Dan David**
Good evening and thank you for the opportunity to be able to say something. For the past couple of weeks I've been trying to figure out something I could say this evening that would have some kind of meaning. I was always having to remind myself of something I learned a long time ago was that if you point your finger at someone you've got three fingers pointing back at you. So a lot of what I thought that I could say would be just that very thing, pointing my finger at the Port and governmental agencies but then I'd also have to look at myself. The difficulty for me and I think one of the difficulties specifically in the Bellingham area is that I believe that I'm here for the same reason that a lot of other people are here and that's because they love the earth and they love nature and more than that they love life and so all these words well for example capping to me when I hear that word and I read about so what does that mean and ok capping and the first word that pops in my mind is band aid it's just to me it's like every other policy, it's like every other avenue and its in every walk of our life put a band aid on it, turn our back, deny its there and it will go away but it won't and the challenge is, when are we going to stand up for life? It's our children as future generations, its ourselves and so I thought I'd go ahead and be brave and say something, I'll just go ahead and go with it, I've been having dreams of walking on this planet and it's bare and the trees are dead and there's no green and I wake up and its like this nightmare but then the real nightmare is in the daytime when I hear its all of how we perceive of life or don't respect it or don't honor it or don't bless it. Now for me this really means something as I'm sure it does for everyone here. I have along with those dreams of when I perceived to be the future, I have dreams going all the way back to Atlantis when it was just the same thing technology for life, technology and all of this stuff up here and we fail to connect with here. Thank you.

**Moderator**
Steve Irving followed by Rodd Pemble

**Steve Irving**
I think just about everything I was going to say has already been used but I'll just repeat it. I think that the Whatcom Waterway, the ASB, the Log Pond, the SW corner of the ASB and all of the other identified hot spots for mercury should be cleaned up. I think we have one good chance of getting mercury out of the bay and it's right now during this process. If we miss this chance, we probably won't get another good one, we probably will never get another one.

We all know that mercury bioaccumulates we know that is bad. I'd like to believe in the caps but I just can't. Most of the reasons are just all the things that people have brought up. And I just kind of wrote down some of them that I had already thought of. I don't want to take credit for all of them.

All of them seem to be pretty short term to me. We can't even, we won't know what it is going to happen. We won't even know what is going to happen ten years from now, let alone 500 years. We should do this the best way we can. For the reasons that have already been said; storm surges, tsunamis, earthquakes, and somebody mentioned the Nooksack sedimentation that will keep the cap on. We've got to remember the Nooksack changes course. It hasn't done it in our lifetime but sometimes it goes on one side of Gooseberry Point and sometimes it goes on the other one. On big storm surges it's come close sometimes to go out the other way. If it goes the other way you're going to lose all of that sedimentation. You know, right were we're using this is going to cap it, well maybe it isn't, maybe the Nooksack is going to go the other way.

I would like to add two more, well actually I wrote two more, but somebody already took one of them. One of the things that really gets me with the Whatcom Waterway is that we have a big creek coming through there and people have stood on the creek during a storm – there's a lot of water coming down that thing. You get all that water with the low tide you're going to get cutting down on that creek.

The other one was the global warming, if some predictions that have been made for what our future is going to look like as far as sea level. That's going to change what we're planning for Capping isn't going to work because you are going to have much higher water levels. So, that's fine.

**Moderator**
All right thank you. Rodd. He is followed by Heather Trim.

**Rodd Pemble**
I have a terminal affliction with doing math problems in my head so I couldn't resist when I heard a 100 foot diameter earlier for the sample radius or one sample serves a circle 100 feet in diameter. Well it was 100 to 500 I believe. So I'm going to give them the benefit of the doubt and let's say it only represents 100, much more dense than if it were 500.

That's the equivalent, 25 samples, of talking to 3 people in Whatcom County each year for the last ten years and deciding based on those 25 or 30 conversations what the people in Whatcom County are like. So think about that. That's how much we know about the sediment in the Waterway.

I'm speaking tonight in opposition to the selection of preferred alternatives 5 or 6 by the Department of Ecology. I base my opposition on 3 arguments.

First there is a logic problem. With the approach of dredging mercury-laden sediments from the aerated stabilization basin or the ASB and a bit from the deep water shipping terminal while capping the vast majority of mercury-laden sediments in the Whatcom Waterway. Mercury concentrations in the ASB will be subject to virtually no wave action while the waterway sediments will be exposed to constant wave action.

Mercury sediments in the ASB will be subject to much less scour from boat traffic then the constricted waterway. Mercury sediments in the ASB are obviously not subject to creek flows like sediments in the creek as our last speaker pointed out.

Mercury concentrations in the shipping terminal are much lighter than in the inner waterway. So why is it of paramount importance that we dredge such toxins from the ASB and the shipping terminal, but leave Whatcom Creek contamination in place? Because there is another agenda, that's why.

The Port commissioners held a lot of public meetings and took in many, many comments from citizens and then decided to do what it appears they planned to do all along. Install a new a marina in the ASB and maintain deep water shipping. According to the Department of Ecology flyers mailed to my home DOE must plan for local land use changes and the Port apparently had the final say in the land uses for the ASB and the waterway. Despite Department of Ecology statements that the Port must do what DOE tells them to do it appears that political decisions made months or years ago by our Port commissioners now drive citizen's cleanup choices.

Where are alternatives 9 and 10, removing all contaminated sediments above state cleanup levels then restoring waterway habitat and either build a marina or adding more habitat in the ASB? Who decided if you dredge the entire waterway of mercury, you must go back to using the creek for industrial purposes? I imagine alternatives 9 and 10, though they may in fact be more cost effective, did not fit with the Port's dreams and thus were dismissed out of hand. It seems there are inconvenient truths everywhere one goes these days.

My second objection to all the alternatives is the baseline assumption about how much fish the average person eats and how action thresholds are therefore determined. Mercury bioaccumulates from sediment up the food chain but if you say the average fish eating person eats less than 5 oz of fish day as the Department of Ecology did, then you end up justifying more mercury remaining in the food chain without cleanup.

But what if you say the average fish eating person eats maybe 10 or 12 ounces of fish a day. You must strive to remove more of the mercury before people and animals ingest it. I grill wild caught fish frequently and my family of four easily eats a 3 lb salmon in one meal, much less one day. Raise the daily fish assumption to reflect the real world and let the chips fall where they may.

Along the same lines I was dismayed to see bioassays supplanting direct human health risk assessment. Again with the effect that mercury concentrations more than double the state cleanup standard will be allowed to remain in the waterway. This administrative sleight of hand ought to make Department of Ecology scientists, like this gentleman who is sitting in front of us and who was at the meeting at the courthouse the other night. I would think it ought to make you hopping mad.

What's the state cleanup action level for if department staff can over rule its implementation arbitrarily?

My third objection to alternatives 5 and 6 rests on a more difficult question. How much will it cost to monitor and repair the proposed capping? Who pays for that? And how can we ensure the caps and monitoring in perpetuity?

Department of Ecology sediment scientists said during a recent public meeting in Bellingham that a quarter million dollars a year might easily might be in the ballpark of monitoring costs for the capping proposed. Let's add another $250,000 a year to cover likely repairs to the caps and in just 50 years we'll have spent $25 million more dollars and we'll still have major mercury contamination in the waterway.

**Moderator**
You have about a minute left sir.

**Rodd Pemble**
In a hundred years we'll have spent $50 million and the waterway will still be polluted. In 500 years our community will have spent $250 million and the waterway will still be polluted with mercury.

$25 million coincidently is about the amount taxpayers would have to pay beyond cleanup funds from the state and other grants to completely cleanup the entire Whatcom Waterway and ASB now.

On a related, but critically unique note no one has yet described for me the organization who will be responsible for carrying knowledge of the mercury forward into the future, indefinitely, to prevent future generations from accidentally releasing mercury into the bay. We can't preserve societal information and standards for 100 years, how can we possibly manage it for 1,000 or 10,000? Who volunteers for the mercury priesthood? And who will pay their wages?

Do we think because we'll be dead and gone we shouldn't worry about it? Never mind the Log Pond cap is already failing after just 5 years. A pox on us, and I will say that again, a pox on us. If we blithely assume the future will take care of itself. We've buried almost the equivalent of spent nuclear fuel at our own front door. An environment that changes constantly and is subject to mass disruption.

Not only do these alternatives assume an infant technology, capping, will last forever but they have no guidance on how we're to remain on guard and careful for as long as humans and animals live upon this shore.

As a taxpayer, husband, father, businessman and boater common sense says cleanup all the poison now as best we can instead of relying on a technical fix and paying forever for monitoring and repair. If the doctor had the opportunity to remove all the cancer from your child or your spouse, would you choose to leave half of it and have them endure years of chemo because radical surgery would cost twice as much?

**Moderator**
Can I get you to summarize please?

**Rodd Pemble**
I'm on the way.

A truly clean waterway and ASB is the best gift, the only responsible gift this community can give to future generations. Our children's and their children's, seventy times seven generations. Or we can take the cheaper way out and saddle our descendents with an eternity of vigilance and expense for a problem we caused but couldn't bring ourselves to cleanup. What a sad commentary that would be to the generation of Washington leaders and citizens who cry "we must hold students accountable."

Twenty five years from now as we watch otters play along the banks of Whatcom Waterway some summer evening I want to be able to look my daughters in the eye and say I did my part. So tax me my share of the extra money and for once let's get it right. Thank you. Rodd Pemble 2915 Cedarwood, Birchwood neighborhood in Bellingham.

**Moderator**
Thank you. Heather Trim is next followed by Mitch Friedman.

**Heather Trim**
Well I'm no way as eloquent as that, or Dan David either.  My name is Heather Trim I'm with People for Puget Sound. I'm out of our Seattle office. I'm our toxics lead which is why I'm here and not our local staff.

I want to first address public process. This meeting would not be held if Wendy had not raised 50 signatures to get this hearing to take place and I attend many, many public hearings and I rarely see this number of people at any hearing. So I really hope that for all future efforts here in Bellingham you will hold public hearings and not even have us have to do a process to get that to occur.

I also hope you can put the comments, these are great comments that are over here, and it would be very helpful for us to have these on the web as soon as possible. It's very easy to scan them in, I know that your public process person can do that, and there is information there that is not available in the documents that we see that are on the web right now.

People for Puget Sound's position on dredging vs. capping is that we prefer dredging. We want to get the mercury and other contaminates out of the system.

Capping is a far second choice. Mercury is a persistent bioaccumulative toxin. It's in the system, we have, as well as for PCB's and other contaminants, we're circulating them around the system and it's time to just get rid of them.
.
As a previous speaker said this plan is, if you look at it, it is sort of based on dredging of convenience. Where the dredging occurs has to do with navigational ease and other needs as opposed to based on the science of where it actually gets the contaminates out, and I will address this issue of convenience and politics a little bit later in this comment.

Significant state monies are going towards this cleanup and navigational needs should not be considered as a cost of cleanup for this site, that's a separate pot of money. The governor is now pushing very hard to get Puget Sound cleaned up by 2020. This site and other sites in Bellingham Bay are part of that effort and we really need to do the right thing at this point. We need to make sure the money is accounted for properly.

I would not look at the Log Pond cap as a success as was previously stated. I have a bit of a different twist than the person who spoke about this generally before.

When that cap was proposed and engineered and all the public process went on with that cap. The public at that time, I assume, was assured this is a great cap, it's engineered it's going to last forever. When in fact, after 5 short years it is eroding. Therefore when you look at caps elsewhere in the system you have to really be skeptical about it. That after 5 years they won't also be in. So this engineering issue is a very challenging issue.

Climate change as was previously mentioned is something that's not really addressed very well in these documents from what I've seen. One of the predictions from climate changes is more intense rain storms.

Then the geological comments by the previous woman I think are very much in place. Tsunami's – I don't think it's OK to say that if we have a tsunami we will be a lot worse contaminations here in Bellingham Bay. The mercury being sprayed all over the place will be a lot worse than say blowing up gasoline tanks and underground tanks, things that will volatilize. We really need to be concerned about the PBT's in this area and get rid of them and be worried about tsunamis

People for Puget Sound very much wants to see habitat as part of this plan. So therefore we're going to very much support those alternatives.

In terms of the fish consumption levels. I work a lot on the Superfund sites in the Duwamish and there we are using a much larger consumption value – or flip it the other way risk value. I think that the number should be used that is more reflective of tribal consumption rates, as well up here.

I also think that we should clarify that this is not Ecology's plan. The PRP's wrote this plan and Ecology has basically had to react to that. You're in a position of having to react to a plan you were given. I think that if in fact you all were writing the plan it would be very different and very much stronger plan. I know Pete has, I don't know you Lucy, but Pete has a very long and good history at Ecology and I know that you would maybe have a bit of a different plan if you were going to be proposing it and I'll address that here which is this process is a political and economic process and it's interesting that I'm one of the last speakers here and in fact I haven't heard anyone speak in favor of keeping mercury in place in this site.

**Moderator**
You have about a minute left ma'am please.

**Heather Trim**
OK, I'm almost done.

In a site that I worked on in Seattle we did politicize the process further. We went to the port commissioners and said can you please clean this up better? I'm interested that the Port commissioners don't appear to be here. The two Mike's are here. I think if the community in fact is interested in having a better cleanup the Port and the community should work together to get that done. I think that Ecology would probably bless that. I'm sure that you guys – at least that's what happened at some other sites that Ecology and EPA would thrilled for better cleanups

So I think that it is worth it to lobby Olympia for more state money and also to raise the funds locally. Thank you.

**Moderator**
Thank you. Mitch is up next and he is followed by Ethan.

**Mitch Friedman**
Mitch Friedman, 1208 Bay Street. Not a lot remains to be said. The alternatives other than 5 and 6 – I share Heather's concern that they feel a bit like straw men. I appreciate the existence of alternative 3. It ought really to score fairly well. It removes a heck of a lot of mercury. It maximizes protectiveness it does it in a cost effective way, but because the landowner doesn't want it, it's a straw man. It doesn't give us a marina.

The higher alternatives, alternative 7 would remove quite a bit, but again it's based on a land use on a navigable waterway that really isn't the issue anymore. So we've got a limited set of alternatives. We don't really have an alternative based on maximizing protectiveness in the most cost efficient way.

I think what is driving this process is the sense of maybe optimism that the community doesn't share. When I say optimism it's somewhat counter-intuitive that there would be ten plus tons of mercury that would be discharged into the waterway and the bay over the last half century. Yet we wouldn't have a public health catastrophe on our hands. I don't think we really understand why we don't. We have a name for the fact that we don't have a catastrophe. We call it natural recovery. We're not sure whether whatever condition is prohibiting the uptake of mercury right now will continue into the future.

All of the things we're talking about tonight – seismic and wave action and grounded ships and tsunami's – all of these things aren't a matter of if, but when – within a lifetime of mercury. None of those things make optimism about natural recovery, about future uptake of mercury, very responsible. I don't know how we would begin to calculate the odds, the odds that mercury will not uptake under alternative 5,under a marina scenario. You know in the next 50 to 100 years are the odds 5 percent that we'll continue to enjoy an absence of mercury related diseases in an obvious way? Is it 50 percent, 95 percent, I don't think any of us know, but I do know that I presented to the director of Ecology with copies of 6400 signatures on the healthy bay initiative last week.

I know that everybody here tonight commented a great deal of concern, despite our primary sources of information being the Port and the city, that's being dragged along by the port, the *Bellingham Herald* that gives free advertising to the Port every week. They're still an extraordinary amount of concern in this community and a reluctance to just be optimistic. I hope, I'm sure that we all look to the Department of Ecology. I hope Department of Ecology comes through in putting the protectiveness of the health of this community foremost.  Thanks.

**Moderator**
Thank you. Ethan and he is followed by Seth Cool.

**Ethan D'Onofrio**
Ethan D'Onofrio, seventeen year Whatcom County resident.. I wasn't going to speak tonight, I didn't really plan too, but I kind of felt compelled to under the circumstances.

I think George kind of hit the nail on the head earlier when he said the fact that we're having a meeting to discuss whether or not to pull tons of mercury out of the bay is kind of just ludicrous. I can certainly appreciate that, seeing as how you guys don't live here, and pretty much everybody in this room is probably about twice my age, a lot older. It' really not a big problem for you guys. But being the age of 25 it is a big problem to me. I understand it is a little disconcerting for some people, but it's infuriating to me to just sit by and watch my planet continue to be destroyed.

So all I ask is for once you make a decision that keep's the interest in my generation and the generations to come at heart. We've got to stop the cycle at some point and here's the opportunity. You guys wanted a public hearing. Here's your public feedback. Everybody in this room wants that mercury out. So the resounding response to your plan is no, come back with a plan that we decide as a community we're in favor of. Thank you.

**Moderator**
Thank you. Seth and he will be followed by John.

**Seth Cool**
Seth Cool, 711 Gladstone Street. I'm just here to voice my support for removing the mercury from Bellingham Bay. I don't think capping it is a good idea. I think it should be completely removed. It's really important that we do it right the first time, that this problem isn't left to fester, isn't left for future generations or my generation for that matter to go through this process all over again and pull the mercury out of Bellingham Bay as I believe needs to be done.

So please get rid of it. Thank you.

**John D'Onofrio**
John D'Onofrio. I live in Bellingham. I don't envy you, you're work will go a long way in determining the health and the welfare of this community for generations to come and yet apparently you're subjected to enormous pressure to reach a pre-ordained conclusion that furthers the economic strategies at the Port of Bellingham.

It must be difficult, especially if you understand that the people of Bellingham want the mercury removed. People for a Healthy Bay successfully gathered 6400 signatures in just a few short weeks in support of the Healthy Bay Initiative. The initiative was torpedoed by the city council but those signatures must make you somewhat uncomfortable. You have difficult jobs, squeezed as you are between the powerful economic pressures on the one hand and the wishes and the long term health of our community and our children. I don't envy you, but I do sincerely hope that you will do the right thing here and mandate the obviously best choice with respect to remediating the mercury by removing it now when it can be done. Thank you.

**Moderator**
John is the last person who has indicated that he wanted to testify. Is there anyone that I missed or someone who has now decided they would like to? Again, if you could go ahead and step on up, state your name again because I don't have your card in front of me.

**Charles Maliszewski**
Hi, my name Charles Maliszewski. I live at 760 Old Samish Road. First of all I would like to congratulate you guys for sitting through an entire evening of this. It's kind of like the people at a carnival everybody is throwing water balloons at and making sure that they fall into the big tank of water.

Actually I would like to thank you for being public servants. I know it's not an easy job. I will return the discussion to the more arcane. There have been some very eloquent testimonies here and all I wanted to address was the numbers being used by the Department of Ecology as determinants of whether something is a safe mercury level.

I'll try not to talk too much about MCUL and SQS and BSL but my finishing statement will be we hope you will use the MCUL as your determinant for what is a safe level of mercury in sediment and subsurface sediment and I have two main reasons why I would argue that.

The first reason is because there are many sites in the bay that exceed MCUL and SQS. The numbers say that chemically there is too much mercury here. The bioassays don't support that. The MCUL and SQS numbers are built on a circular argument about chemistry vs. biology There are so many holes in that argument. Now again I realize this is state law, it's not likely that my testimony is going to change it, but if it doesn't happen at this site, boy I sure wish would really think harder about that bioassay versus chemistry argument because as a scientist it makes no sense to me at all.

As an example because we do see a lot of sites out here that exceed the MCUL but don't pass the bioassay one objection that I do have is once that is site no longer, once that site passes a bioassay almost never has anyone gone back to those sites to retest for chemistry and biology. So what one sees as you follow the timeline from when testing began was fewer and fewer and fewer bioassays to the point it was just a handful in the last series of tests. That to me makes no sense, because you've gone from barely statistically significant to nonstatistically significant.

OK let's get away from MCUL we'll go to BSL. So BSL is the bioaccumulation screening level that's based on a comparison between the amount of mercury that is measured in organisms from the area relative to the amount of mercury that is in the sediments that are within the home range of these organisms. There was a regression analysis that was performed. Don't need to go into details on that, that will be written up, that suggests that 1.2 mg/kg is a safe level. Several problems with the regression analysis. The first problem is that when you do a regression analysis you never go beyond your data points to come up with a value and that's exactly what you do. I believe the highest sediment value on the regression curve is .9 where as you come up with a 1.2 mg/kg. That's just bad math, you can't do that.

Secondly, we are assured throughout, I believe it's section 5 of the RI that conservative estimates are used throughout in determining the what is considered the safe level. Well Wendy's scientific advisory group spent a lot of time going over those numbers. We've got biologists, geologists, hydrologists, toxicologists and none of us was able to make real sense of it. In fact I have to say the latest iteration; the latest explanation in this RIFS is so cloudy that I literally stayed awake nights trying to figure out what it really meant.

OK let's get down to basics. If you really take into account subsistence level consumption of fish and shellfish in this area and you plug that into the regression analysis you come up with a value that is 2.5 to 5 times lower than the BSL that is actually generated from the description in the RIFS. That's a number that is even lower than the MCUL. So a proper BSL is even less than the MCUL which requires bioassay support.

So conservatively then I would argue that you use the current MCUL as your level for determining what a safe level of mercury in sediment and subsurface sediment. Thank you.

**Moderator**
Thank you. Yes sir.

**Dave Courtis**
My name is Dave Courtis I live at 440 Island Dr. I’m a geologist or at least was before I retired. The statement was made tonight that there is a low level of mercury contamination in the subsurface. I haven’t seen anything that really shows visually what that rate of contamination is over an areal extent. To me that is a critical factor in determining how and why a particular decision should be made.

I would suggest it sounds like there is a much greater need for subsurface core holes to determine the areal distribution of mercury contamination. I think that information should then be put on maps and cross sections and fence diagrams so that you as well as the public can then get a very good idea as to what the distribution really is. I would suggest that the mercury distribution is probably not homogenous. There is probably hot spots. If you have the data, focus on the hotspots, get rid of that first and then you can do dredging or whatever else you want if the residual mercury level is low enough to allow that.

The other thing is if you’re dredging can you identify mercury content as your dredging. So once again you can focus on removing that and then through that area that does not require the upland disposal it would reduce the costs considerably. Thank you.

**Moderator**
All right. Thank you. Is there anyone else who has not had an opportunity to comment? Sorry about that.

**Jenny Meyer**
I want to agree with everybody that spoke tonight. Jenny Meyer and I’m from the Birchwood district. I lived here most of my life. I remember going downtown when we had to take a handkerchief and hold it over our nose because what we called the pulp mill had this stuff in the air. And we were down Cornwall and Holly Street. It went all over the place and we couldn’t breathe so we would get on the bus and go home. That’s not great. They should have done something then. But I haven’t heard anything about how you’re disposing of all this junk. You’re going to go dig a hole in somebody else’s mountain and put it down there for them to take care of? And we’re going to pay for that also?

Why don’t we just build or get some great big heavy tanks that are secure and put all that garbage in there until in the future somebody smart, like these people, will know how to separate this stuff and get rid of it safely. That’s all.

**Moderator**
Thank you. Yes sir, back to you.

**Doug Carlburg**
My name is Doug Carlburg. I live here in Fairhaven. I don’t come to many of these meetings; they are hard to make it too. This stuff is tough to get your mind around especially if you don’t come to too many of them. It’s impressive to see this many local people who have stopped and taken the time to get their minds around this science without the training and the dedication they

put in.  Looks to me like the most significant evidence that you have in your hands today about the public of Bellingham are the surveys and the signatures that were gathered

I think this decision belongs to us today. 500 years from now there will still be people here, hopefully. They'll look back at our judgment. The extra money to clean up the mercury, correctly, is insignificant over a 500 year period. A good cost-analysis takes a look at how much you spent and how long what you spent the money on gets done.

If you buy something that lasts ten years, it costs more money but it might be less money over the long run.

But I don't think 500 years from now people want to be continually worried about a band-aid problem.

It's a unique opportunity with Georgia Pacific shutting down, that opportunity comes only about once every 100 years and it's our decision now.

I don't think this whole idea of if I can use an analogy if you have poisons in your home it doesn't matter whether they were there when you got there or you put them there you don't let children only have 5 ounces of it and say that' s enough, your tolerance level is fine. You don't put a rug over it. You do the responsible thing. I think not cleaning this up will be looked at 100, 200 years from now as irresponsible on our part. It's sad to say the Port of Bellingham is one of the major impediments to having this happen. The Port of Bellingham has done a lot of great things but on this is issue I think they are dead wrong.

I think that their desire to have a yacht harbor, which 30 years from now I don't think they'll be rich enough to own a yacht, but we've got poisons on one hand ,we've got a yacht harbor on the other and that's the politics. It's fortuitous to have a poisonous dump that needs to be removed directly adjacent to a pond that is designed to hold pollution.  It doesn't get much simpler than that, put it in the pond.  Don't send it to somebody else to take care of our poisons.  Like I said, if you buy a house with poisons in it, clean it up.  Don't blame the guy before you, just get in there and clean in up but don't send it to Wenatchee and tell them they have got to clean it up otherwise they will be sending their crap here.  That's my comments.

**Moderator**
Yes ma'am

**Robin Dupre**
Hi, my name is Robin Dupre and I wasn't going to comment because, well, it's all redundant. I do however point out that I started working on the Bellingham Bay Pilot in about 1996 and for a long time I was the only citizen that would go to every single meeting and I'm appalled that we're all still having this conversation 10 years later. In my mind it's not about what we do with a marina. If you want to have your marina, great! So here's the deal I challenge the Port of Bellingham and the Department of Ecology to set aside the marina. Make that decision later. Do the best cleanup now.  Then if you want a marina, you want a shipping channel, you want salmon habitat, you got it because your options are not foreclosed. So with the Port, and I

recognize this isn't a referendum on the Port, but if the Port would like a marina, I would like to challenge the Port of Bellingham to offer the citizenry something in return and that's a clean bay. And they might find a whole lot less resistance to their marina concept in the end.

So you two and all the staff and cleanup are troopers. You have been doing this for a very long time. I'm sure Lucy, you would like to do something and not retire from the Bellingham Bay Pilot project, but we may all if we don't make this choice now and make a decision is protective in the long term and the decisions that we're being faced with appear with the new capping data to not even be protective in the short term. So why are we being offered those things?

So, long term in my mind doesn't mean 5 years from now, it doesn't mean 10 years from now. To me long term means my little grandchild, who is now 4, is dead and gone. That's long term.

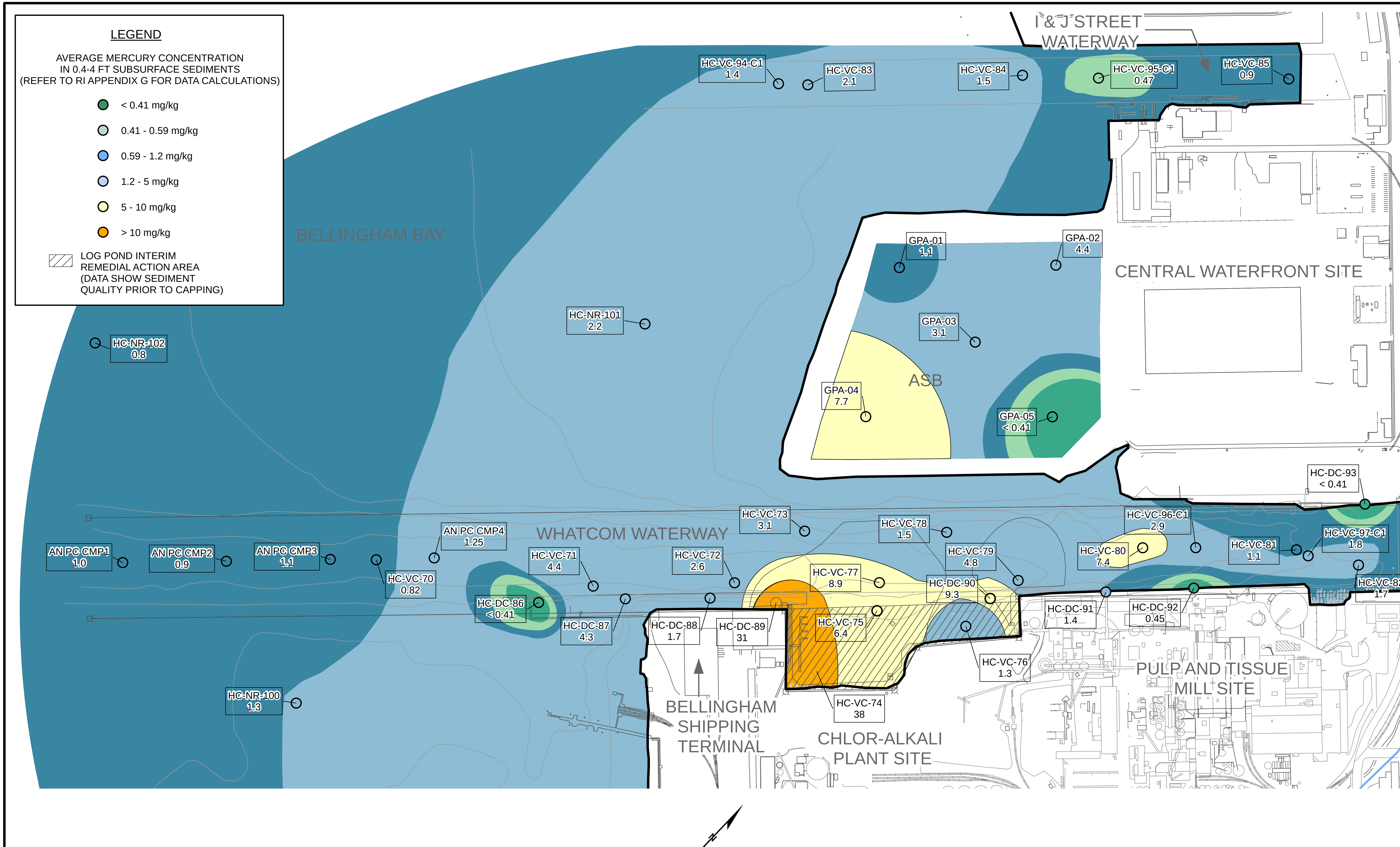
Thanks.

**Moderator**
Thank you. Anyone else? While you're contemplating that last final prospect, I will remind you that once again written comments received by December 18 will be considered and responded to as part of the public record. I'm going to read this address to you but it's also contained in this blue fact sheet that you can find on the back.

To be addressed to Lucy McInerney, Department of Ecology, 3190 160th Ave, Bellevue, WA. It must be received by December 18th.

Seeing that there is no one else indicated that they want to testify, on behalf of the Department of Ecology I want to thank you for your thoughtful and respectful comments. Let the record show that this hearing is now closed at 8:47 pm. Thank you.

# RESPONSIVENESS SUMMARY
APPENDIX C



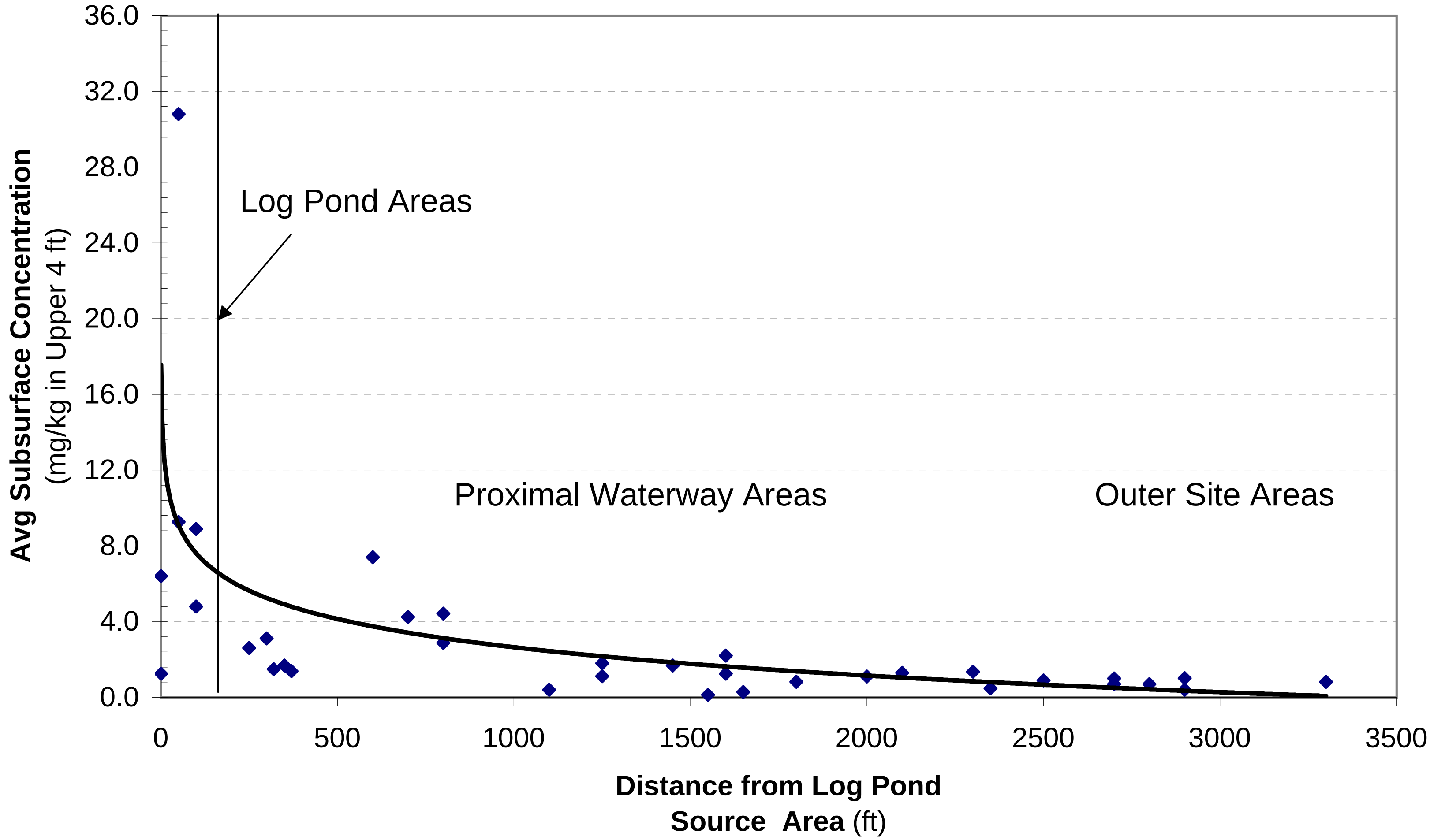

WHATCOM WATERWAY
REMEDIAL INVESTIGATION
PORTB-18876-240

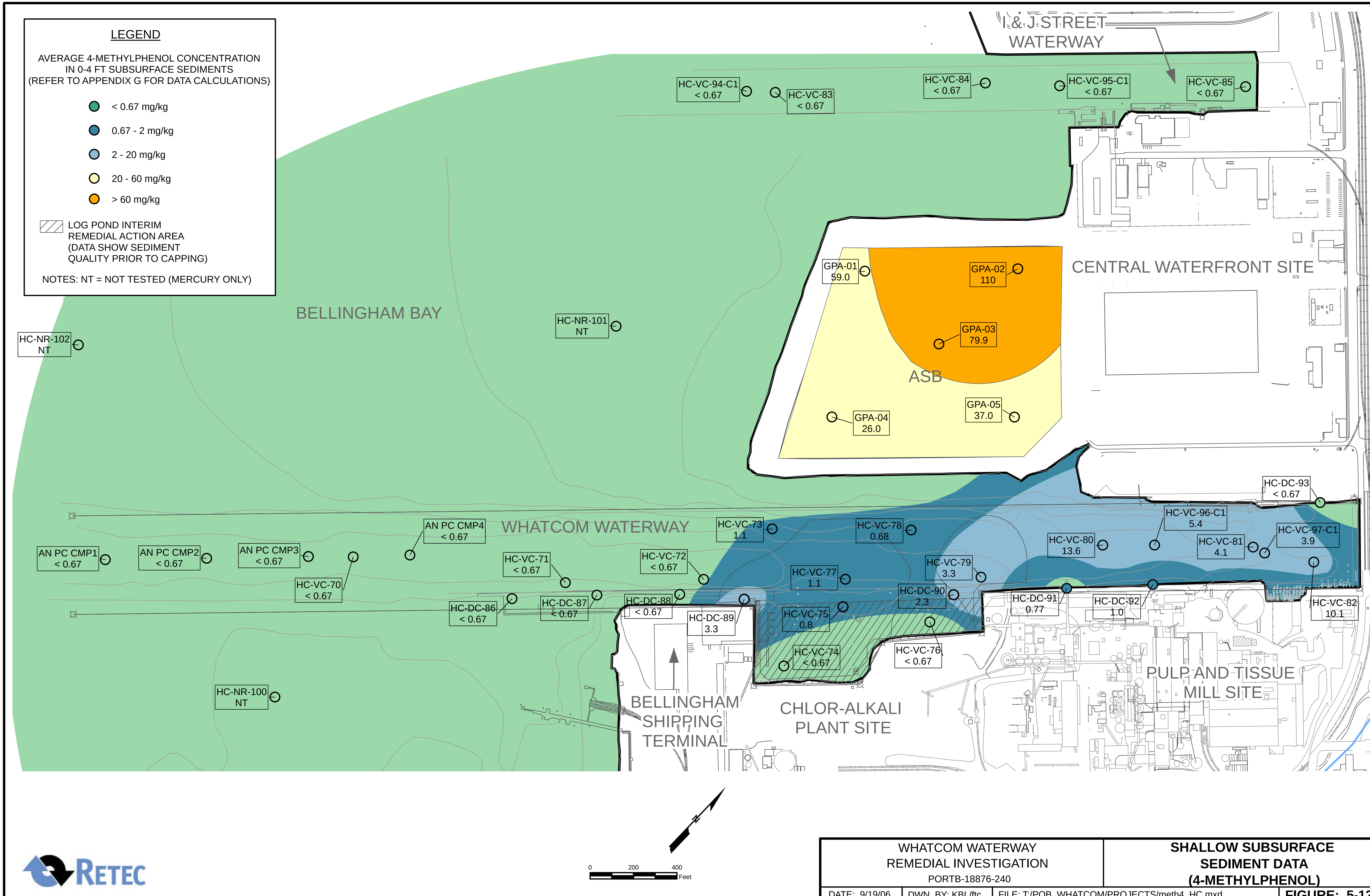
**SHALLOW SUBSURFACE SEDIMENT DATA (0.4 - 4')**
**(MERCURY)**

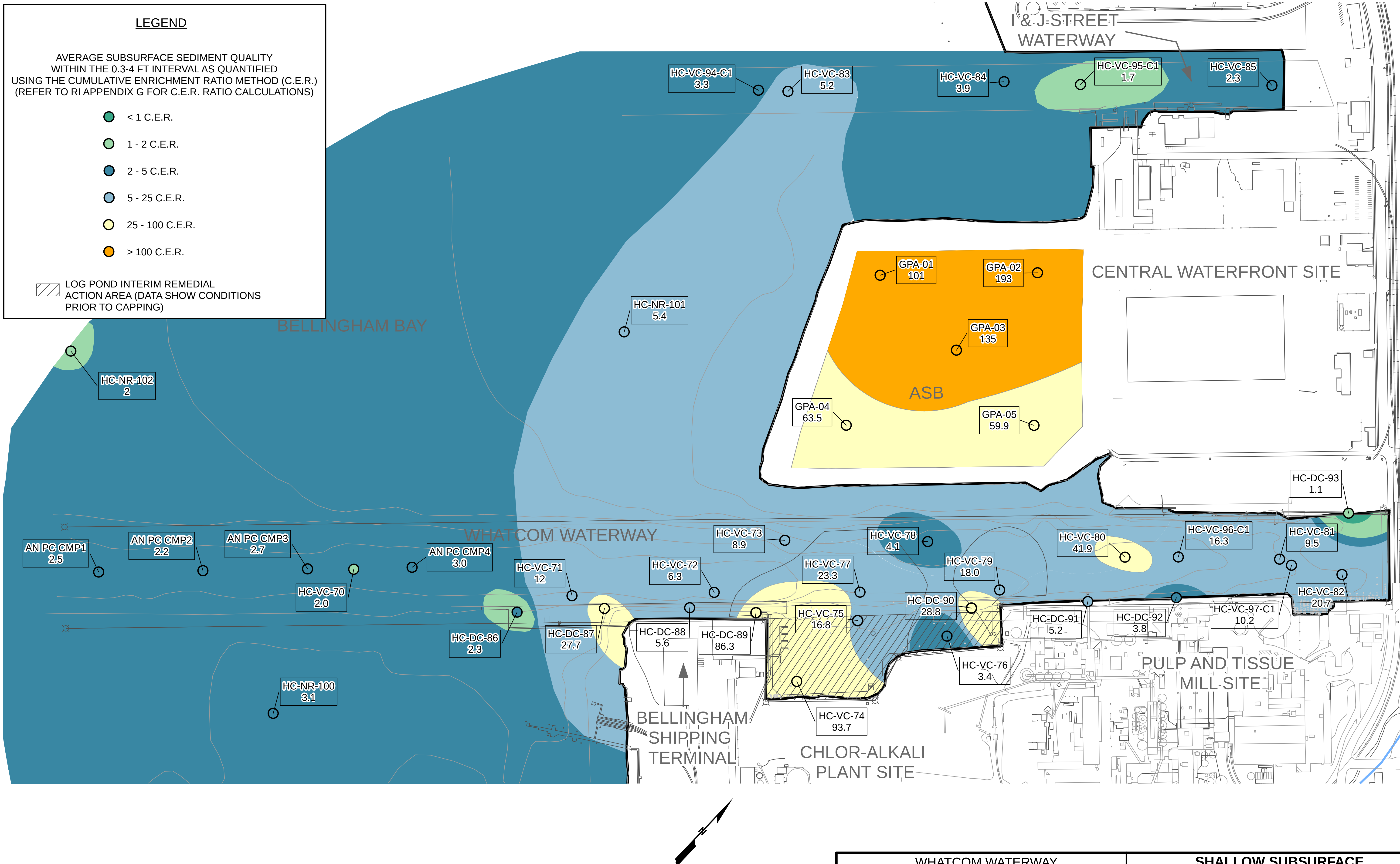
DATE: 9/19/06 | DWN. BY: KBL/ftc | FILE: T:/POB_WHATCOM/PROJECTS/erhg_HC.MXD

**FIGURE: 5-10**

## Figure 5-11. Decrease in Subsurface Mercury Concentration with Distance from Log Pond Source Area




LEGEND
AVERAGE 4-METHYLPHENOL CONCENTRATION
IN 0-4 FT SUBSURFACE SEDIMENTS
(REFER TO APPENDIX G FOR DATA CALCULATIONS)
< 0.67 mg/kg
0.67 - 2 mg/kg
2 - 20 mg/kg
20 - 60 mg/kg
> 60 mg/kg
LOG POND INTERIM
REMEDIAL ACTION AREA
(DATA SHOW SEDIMENT
QUALITY PRIOR TO CAPPING)
NOTES: NT = NOT TESTED (MERCURY ONLY)
I & J STREET
WATERWAY
BELLINGHAM BAY
CENTRAL WATERFRONT SITE
ASB
WHATCOM WATERWAY
BELLINGHAM
SHIPPING
TERMINAL
CHLOR-ALKALI
PLANT SITE
PULP AND TISSUE
MILL SITE
HC-VC-94-C1
< 0.67
HC-VC-83
< 0.67
HC-VC-84
< 0.67
HC-VC-95-C1
< 0.67
HC-VC-85
< 0.67
GPA-01
59.0
GPA-02
110
GPA-03
79.9
GPA-04
26.0
GPA-05
37.0
HC-NR-101
NT
HC-NR-102
NT
HC-NR-100
NT
AN PC CMP1
< 0.67
AN PC CMP2
< 0.67
AN PC CMP3
< 0.67
AN PC CMP4
< 0.67
HC-VC-70
< 0.67
HC-VC-71
< 0.67
HC-VC-72
< 0.67
HC-VC-73
1.1
HC-DC-86
< 0.67
HC-DC-87
< 0.67
HC-DC-88
< 0.67
HC-DC-89
3.3
HC-VC-74
< 0.67
HC-VC-75
0.8
HC-VC-76
< 0.67
HC-VC-77
1.1
HC-VC-78
0.68
HC-VC-79
3.3
HC-DC-90
2.3
HC-DC-91
0.77
HC-DC-92
1.0
HC-VC-80
13.6
HC-VC-96-C1
5.4
HC-VC-81
4.1
HC-VC-97-C1
3.9
HC-VC-82
10.1
HC-DC-93
< 0.67
0
200
400
Feet
RETEC
WHATCOM WATERWAY
REMEDIAL INVESTIGATION
PORTB-18876-240
SHALLOW SUBSURFACE
SEDIMENT DATA
(4-METHYLPHENOL)
DATE: 9/19/06
DWN. BY: KBL/ftc
FILE: T:/POB_WHATCOM/PROJECTS/meth4_HC.mxd
FIGURE: 5-12




RETEC

| WHATCOM WATERWAY<br>REMEDIAL INVESTIGATION<br>PORTB-18876-240 | **SHALLOW SUBSURFACE SEDIMENT DATA (0.4-4) (CUMULATIVE ENRICHMENT RATIO)** |
|---|---|
| DATE: 9/19/06 \| DWN. BY: KBL/ftc \| FILE: T:/POB_WHATCOM/PROJECTS/CER_HC.MXD | **FIGURE: 5-13** |

## Table 5-3. Average Properties of Site Subsurface Sediments and ASB Materials

| Parameter | Units | SQS | Remaining Waterway Site Sediments [1] | | ASB Sludges | | Native Sands Underlying ASB Sludges [2] | | ASB Berm Sands | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Avg Conc. | Enrichment Ratio | Avg Conc. | Enrichment Ratio | Avg Conc. | Enrichment Ratio | Avg Conc. | Enrichment Ratio |
| **CUMULATIVE ENRICHMENT RATIO** | | | -- | **12** | -- | **120** | -- | **< 1** | -- | **< 1** |
| ***Conventional Parameters*** | | | | | | | | | | |
| Total Solids | % | -- | 46 | -- | 17.4 | -- | 82.9 | -- | 96.0 | -- |
| Total Organic Carbon | % | -- | 4.7 | -- | 33.2 | -- | 0.51 | -- | 0.15 | -- |
| ***Heavy Metals*** | | | | | | | | | | |
| Mercury | mg/kg dwt | 0.41 | 3.5 | **8.4** | 5.7 | **14** | 0.1 | < 1 | 0.05 U | < 1 |
| Cadmium | mg/kg dwt | 5.1 | 1.9 | < 1 | 12.6 | **2.5** | 0.4 | < 1 | 0.20 U | < 1 |
| Zinc | mg/kg dwt | 410 | 172 | < 1 | 1840 | **4.5** | 29.7 | < 1 | 33.2 | < 1 |
| ***Phenolic Compounds*** | | | | | | | | | | |
| 4-Methylphenol | ug/kg dwt | 670 | 2,526 | **3.8** | 54373 | **81** | 177 | < 1 | 19 U | < 1 |
| Phenol | ug/kg dwt | 420 | 107.5 | < 1 | 866 | **2.1** | 8.9 | < 1 | 19 U | < 1 |
| 2-4-Dimethylphenol | ug/kg dwt | 29 | 15 | < 1 | 102 | **3.5** | 9.3 | < 1 | 19 U | < 1 |
| ***PAH Compounds*** | | | | | | | | | | |
| Naphthalene | ppm TOC | 99 | 12 | < 1 | 28 | < 1 | 13 | < 1 | 15 U | < 1 |
| Fluorene | ppm TOC | 23 | 8.1 | < 1 | 1.0 | < 1 | 1.5 U | < 1 | 15 U | < 1 |
| Acenaphthene | ppm TOC | 16 | 6.6 | < 1 | 1.4 | < 1 | 1.2 U | < 1 | 15 U | < 1 |
| Phenanthrene | ppm TOC | 100 | 35.6 | < 1 | 18 | < 1 | 11.6 | < 1 | 15 U | < 1 |
| Fluoranthene | ppm TOC | 160 | 75.3 | < 1 | 17 | < 1 | 11.8 U | < 1 | 15 U | < 1 |
| Chrysene | ppm TOC | 110 | 36.2 | < 1 | 1.9 | < 1 | 1.8 U | < 1 | 15 U | < 1 |
| Pyrene | ppm TOC | 1000 | 76.5 | < 1 | 17 | < 1 | 10.3 | < 1 | 15 U | < 1 |
| Benzo(a)anthracene | ppm TOC | 110 | 24.9 | < 1 | 1.0 | < 1 | 1.4 U | < 1 | 15 U | < 1 |
| Benzo(b&k)fluoranthenes | ppm TOC | 230 | 32.4 | < 1 | 6.5 | < 1 | 3.4 U | < 1 | 30 U | < 1 |
| Dibenz(a,h)anthracene | ppm TOC | 12 | 3.7 | < 1 | 0.70 | < 1 | 1.3 U | < 1 | 15 U | < 1 |
| ***Other Semivolatile Organics*** | | | | | | | | | | |
| Bis(2-ethylhexyl)phthalate | ppm TOC | 47 | 8.0 | < 1 | 83 | **1.8** | 36 | < 1 | 27.6 | < 1 |
| Butyl-benzyl-phthalate | ppm TOC | 4.9 | 1.8 | < 1 | 51 | **10.4** | 10.3 U | < 1 | 19 U | < 1 |
| Hexachlorobenzene | ppm TOC | 0.38 | 0.21 | < 1 | < 0.01 | < 1 | 0.2 U | < 1 | 15 U | < 1 |
| Dibenzofuran | ppm TOC | 15 | 6.0 | < 1 | nt | nc | nt | nc | 15 U | < 1 |

**Notes:**

U: Compound not detected in any samples. Posted result is the average reporting limit of analyzed samples.
--: No applicable value
nc: Not calculated
nt: Not tested
Refer to Appendix G for detailed enrichment ratio calculations.
1. Average of all impacted subsurface sediments within the Whatcom Waterway, excluding previously capped portions of the Log Pond.
2. Excludes ASB sludges and the sludge/sediment contact layer samples. Generally consists of sandy sediments below -16 ft MLLW elevation in ASB area.

# Table G-1. Enrichment Ratios for Contaminated Subsurface Sediments

| Unit | Sample ID | Depth Below Mudline (ft) Top | Bottom | Cumulative ER (x SQS) | Moisture | Total Solids (%) | Total Fines (%) | TOC (%) | Mercury (SQS = 0.41) Conc. (mg/kg) | SQS | Interval ER | 4-Methylphenol (SQS = 670) Conc. (ug/kg) | SQS | ER | Cadmium (SQS = 5.1) (mg/kg) | SQS | ER | Zinc (SQS = 410) Conc. (mg/kg) | SQS | ER | Benzo(a)anthracene (SQS = 110) Conc. (ppm TOC) | SQS | ER | Benzofluoranthenes (SQS = 230) Conc. (ppm TOC) | SQS | ER | Chrysene (SQS = 110) (ppm TOC) | SQS | ER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ASB Sludges** | | | | 119.7 | 82.6 | 17.4 | 62.4 | 33.2 | 5.7 | | 13.9 | 54,373 | 670 | 81.2 | 12.6 | 5.1 | 2.5 | 1,840 | 410 | 4.5 | 1.0 | 110 | 0.0 | 6.5 | 230 | 0.0 | 1.9 | 110 | 0.0 |
| ASB Sludges | GPA-01-A | 0 | 6 | 101.0 | 92.9 | 7.1 | 44.3 | 33.0 | 1.1 | 0.41 | 2.7 | 59,000 | 670 | 88.1 | 18.0 | 5.1 | 3.5 | 616 | 410 | 1.5 | 0.42 | 110 | 0.00 | 1.76 | 230 | 0.00 | 0.91 M | 110 | 0.00 |
| ASB Sludges | GPA-01-B1 | 6.5 | 11.5 | 87.9 | 88.3 | 11.7 | 82.8 | 34.0 | 7.0 | 0.41 | 17.1 | 42,000 | 670 | 62.7 | 18.0 | 5.1 | 3.5 | 667 | 410 | 1.6 | 0.07 U | 110 | 0.00 | 1.94 | 230 | 0.00 | 0.09 U | 110 | 0.00 |
| ASB Sludges | GPA-02-A | 0 | 2.1 | 269.8 | 84.6 | 15.4 | 50.9 | 31.0 | 2.6 | 0.41 | 6.3 | 170,000 | 670 | 253.7 | 13.0 | 5.1 | 2.5 | 438 | 410 | 1.1 | 0.08 U | 110 | 0.00 | 0.30 U | 230 | 0.00 | 0.10 U | 110 | 0.00 |
| ASB Sludges | GPA-02-B1 | 2.1 | 4 | 123.4 | 75.3 | 24.7 | 79.4 | 28.0 | 6.0 | 0.41 | 14.6 | 56,000 | 670 | 83.6 | 8.5 | 5.1 | 1.7 | 474 | 410 | 1.2 | 9.29 | 110 | 0.00 | 32.50 | 230 | 0.00 | 16.79 | 110 | 0.00 |
| ASB Sludges | GPA-02-B2 | 4 | 8.5 | 62.3 | 66.9 | 33.1 | 39.1 | 32.0 | 20.2 | 0.41 | 49.3 | 34 U | 670 | 0.0 | 14.5 | 5.1 | 2.8 | 3,500 | 410 | 8.5 | 0.08 U | 110 | 0.00 | 0.31 U | 230 | 0.00 | 0.10 U | 110 | 0.00 |
| ASB Sludges | GPA-03-A | 0 | 2.6 | 160.3 | 89.6 | 10.4 | 61.3 | 29.0 | 1.9 | 0.41 | 4.6 | 98,000 | 670 | 146.3 | 21.0 | 5.1 | 4.1 | 544 | 410 | 1.3 | 0.09 U | 110 | 0.00 | 0.33 U | 230 | 0.00 | 0.10 U | 110 | 0.00 |
| ASB Sludges | GPA-03-B1 | 2.7 | 5 | 90.2 | 84.9 | 15.1 | 64.0 | 31.0 | 5.3 | 0.41 | 12.9 | 48,000 | 670 | 71.6 | 9.0 | 5.1 | 1.8 | 422 | 410 | 1.0 | 0.08 U | 110 | 0.00 | 1.48 M | 230 | 0.00 | 0.10 U | 110 | 0.00 |
| ASB Sludges | GPA-04-A | 0 | 4 | 63.5 | 89.4 | 10.6 | 86.9 | 44.0 | 7.7 | 0.41 | 18.8 | 26,000 | 670 | 38.8 | 9.0 | 5.1 | 1.8 | 501 | 410 | 1.2 | 0.06 U | 110 | 0.00 | 1.98 M | 230 | 0.00 | 0.07 U | 110 | 0.00 |
| ASB Sludges | GPA-04-B1 | 4.5 | 7 | 150.1 | 83.1 | 16.9 | 96.3 | 42.0 | 5.1 | 0.41 | 12.4 | 7,700 | 670 | 11.5 | 11.0 | 5.1 | 2.2 | 659 | 410 | 1.6 | 0.20 U | 110 | 0.00 | 24.52 M | 230 | 0.00 | 0.23 U | 110 | 0.00 |
| ASB Sludges | GPA-05-A | 0 | 6.5 | 59.9 | 71.0 | 29.0 | 18.6 | 28.0 | 0.40 | 0.41 | 0.0 | 37,000 | 670 | 55.2 | 3.5 | 5.1 | 0.0 | 179 | 410 | 0.0 | 0.09 U | 110 | 0.00 | 0.33 U | 230 | 0.00 | 0.10 U | 110 | 0.00 |
| **ASB - Sludge Native Contact** | | | | 2.8 | 31.5 | 68.5 | 32.5 | 2.3 | 0.6 | 0.41 | 1.4 | 913 | 670 | 1.4 | 1.4 | 5.1 | 0.0 | 89.7 | 410 | 0.0 | 1.1 | 110 | 0.0 | 4.9 | 230 | 0.0 | 1.9 | 110 | 0.0 |
| ASB - Contact | GPA-01-B2 | 13 | 19 | 1.5 | 37.2 | 62.8 | 48.8 | 2.2 | 0.6 | 0.41 | 1.5 | 540 | 670 | 0.0 | 1.3 | 5.1 | 0.0 | 78 | 410 | 0.0 | 0.23 U | 110 | 0.00 | 4.27 M | 230 | 0.00 | 0.28 U | 110 | 0.00 |
| ASB - Contact | GPA-03-B2 | 5.5 | 9 | 2.8 | 28.1 | 71.9 | 19.9 | 2.7 | 0.5 | 0.41 | 1.2 | 1,100 | 670 | 1.6 | 0.9 | 5.1 | 0.0 | 109 | 410 | 0.0 | 2.00 M | 110 | 0.00 | 7.56 M | 230 | 0.00 | 3.67 M | 110 | 0.00 |
| ASB - Contact | GPA-05-B1 | 7.5 | 13 | 3.3 | 29.2 | 70.8 | 28.8 | 2.0 | 0.68 | 0.41 | 1.7 | 1,100 | 670 | 1.6 | 2.1 | 5.1 | 0.0 | 82 | 410 | 0.0 | 1.20 M | 110 | 0.00 | 2.80 U | 230 | 0.00 | 1.70 M | 110 | 0.00 |
| **ASB - Native Sediments** | | | | < 1 | 17.1 | 82.9 | 17.5 | 0.51 | 0.09 | 0.41 | 0.0 | 177 | 670 | 0.0 | 0.4 | 5.1 | 0.0 | 29.7 | 410 | 0.0 | 1.4 | 110 | 0.0 | 3.4 U | 230 | 0.0 | 1.8 U | 110 | 0.0 |
| ASB Native | GPA-01-C | 26 | 32 | 1.3 | 8.9 | 91.1 | 33.3 | 0.40 | 0.02 U | 0.41 | 0.0 | 7 U | 670 | 0.0 | 0.4 | 5.1 | 0.0 | 29 | 410 | 0.0 | 1.25 U | 110 | 0.00 | 9.75 U | 230 | 0.00 | 1.48 U | 110 | 0.00 |
| ASB Native | GPA-02-C | 9 | 14 | 0.0 | 10.0 | 90.0 | 10.3 | 0.60 | 0.1 | 0.41 | 0.0 | 140 | 670 | 0.0 | 0.3 | 5.1 | 0.0 | 23 | 410 | 0.0 | 0.83 U | 110 | 0.00 | 1.30 U | 230 | 0.00 | 0.98 U | 110 | 0.00 |
| ASB Native | GPA-03-C | 12 | 17.5 | 0.0 | 17.1 | 82.9 | 9.9 | 0.30 | 0.02 U | 0.41 | 0.0 | 70 | 670 | 0.0 | 0.1 U | 5.1 | 0.0 | 32 | 410 | 0.0 | 1.70 U | 110 | 0.00 | 2.67 U | 230 | 0.00 | 2.03 U | 110 | 0.00 |
| ASB Native | GPA-04-B2 | 8.5 | 13.5 | 0.0 | 22.7 | 77.3 | 17.6 | 1.00 | 0.33 | 0.41 | 0.0 | 160 | 670 | 0.0 | 0.7 | 5.1 | 0.0 | 37 | 410 | 0.0 | 2.00 M | 110 | 0.00 | 4.00 M | 230 | 0.00 | 3.60 M | 110 | 0.00 |
| ASB Native | GPA-04-C | 18.5 | 23.5 | 0.0 | 20.5 | 79.5 | 18.2 | 0.30 | 0.04 | 0.41 | 0.0 | 44 | 670 | 0.0 | 0.3 | 5.1 | 0.0 | 28 | 410 | 0.0 | 1.67 U | 110 | 0.00 | 2.63 U | 230 | 0.00 | 2.00 U | 110 | 0.00 |
| ASB Native | GPA-05-B2 | 14 | 17.5 | 1.3 | 20.5 | 79.5 | 21.4 | 0.40 | 0.05 | 0.41 | 0.0 | 150 | 670 | 0.0 | 0.5 | 5.1 | 0.0 | 28 | 410 | 0.0 | 1.28 U | 110 | 0.00 | 2.00 U | 230 | 0.00 | 1.50 U | 110 | 0.00 |
| ASB Native | GPA-05-C | 19 | 23 | 0.0 | 20.2 | 79.8 | 11.6 | 0.60 | 0.02 U | 0.41 | 0.0 | 670 | 670 | 0.0 | 0.3 | 5.1 | 0.0 | 31 | 410 | 0.0 | 0.85 U | 110 | 0.00 | 1.33 U | 230 | 0.00 | 1.02 U | 110 | 0.00 |
| **ASB - Berm Sands** | | | | < 1 | 4.0 | 96.0 | 3.9 | 0.15 | 0.05 U | 0.41 | 0.0 | 19 U | 670 | 0.0 | 0.2 U | 5.1 | 0.0 | 33.2 | 410 | 0.0 | 15.1 U | 110 | 0.0 | 30.1 U | 230 | 0.0 | 15.1 U | 110 | 0.0 |
| ASB Berm | BERM-01-10-16 | 10 | 16 | 0.0 | 3.6 | 96.4 | 4.2 | 0.17 | 0.05 | 0.41 | 0.0 | 19 U | 670 | 0.0 | 0.2 U | 5.1 | 0.0 | 32.9 | 410 | 0.0 | 11.1 U | 110 | 0.0 | 22.2 U | 230 | 0.0 | 11.1 U | 110 | 0.0 |
| ASB Berm | BERM-02-10-16 | 10 | 16 | 0.0 | 4.1 | 95.9 | 3.0 | 0.09 | 0.0 U | 0.41 | 0.0 | 20 U | 670 | 0.0 | 0.2 U | 5.1 | 0.0 | 34.8 | 410 | 0.0 | 22.7 U | 110 | 0.0 | 45.5 U | 230 | 0.0 | 22.7 U | 110 | 0.0 |
| ASB Berm | BERM-03-10-16 | 10 | 16 | 0.0 | 4.1 | 95.9 | 3.5 | 0.09 | 0.04 U | 0.41 | 0.0 | 19 U | 670 | 0.0 | 0.2 U | 5.1 | 0.0 | 32.6 | 410 | 0.0 | 20.9 U | 110 | 0.0 | 41.8 U | 230 | 0.0 | 20.9 U | 110 | 0.0 |
| ASB Berm | BERM-04-8-14 | 8 | 14 | 0.0 | 3.6 | 96.4 | 2.5 | 0.13 | 0.05 U | 0.41 | 0.0 | 19 U | 670 | 0.0 | 0.2 U | 5.1 | 0.0 | 30.0 | 410 | 0.0 | 15.0 U | 110 | 0.0 | 29.9 U | 230 | 0.0 | 15.0 U | 110 | 0.0 |
| ASB Berm | BERM-05-8-14 | 8 | 14 | 0.0 | 2.8 | 97.2 | 2.2 | 0.13 | 0.04 U | 0.41 | 0.0 | 19 U | 670 | 0.0 | 0.5 U | 5.1 | 0.0 | 37.0 | 410 | 0.0 | 14.3 U | 110 | 0.0 | 28.6 U | 230 | 0.0 | 14.3 U | 110 | 0.0 |
| ASB Berm | BERM-06-10-16 | 10 | 16 | 0.0 | 4.1 | 95.9 | 1.9 | 0.12 | 0.05 U | 0.41 | 0.0 | 19 U | 670 | 0.0 | 0.2 U | 5.1 | 0.0 | 29.0 | 410 | 0.0 | 15.8 U | 110 | 0.0 | 31.7 U | 230 | 0.0 | 15.8 U | 110 | 0.0 |
| ASB Berm | BERM-07-7-11 | 7 | 11 | 0.0 | 5.6 | 94.4 | 3.6 | 0.13 | 0.05 U | 0.41 | 0.0 | 19 U | 670 | 0.0 | 0.2 U | 5.1 | 0.0 | 30.9 | 410 | 0.0 | 14.8 U | 110 | 0.0 | 29.7 U | 230 | 0.0 | 14.8 U | 110 | 0.0 |
| ASB Berm | BERM-08-10-14 | 10 | 14 | 2.3 | 3.9 | 96.1 | 10.6 | 0.32 | 0.05 U | 0.41 | 0.0 | 19 U | 670 | 0.0 | 0.2 U | 5.1 | 0.0 | 38.6 | 410 | 0.0 | 5.9 U | 110 | 0.0 | 11.9 U | 230 | 0.0 | 5.9 U | 110 | 0.0 |
| **Whatcom Waterway Sediments Average (Excluding Log Pond & I&J Waterway)** | | | | 12.2 | 51.4 | 46.3 | | 4.7 | 3.46 | 0.41 | 8.4 | 2,526 | 670 | 3.8 | 1.92 | 5.1 | 0.0 | 172 | 410 | 0.0 | 24.9 | 110 | 0.0 | 32.4 | 230 | 0.0 | 36.2 | 110 | 0.0 |
| **Unit 1A/B** | | | | 2.4 | 51.0 | 49.0 | 79.6 | 2.0 | 0.99 | 0.41 | 2.4 | 58.5 | 670 | 0.0 | 0.8 | 5.1 | 0.0 | 91 | 410 | 0.0 | 1.8 | 110 | 0.0 | 4.1 | 230 | 0.0 | 2.3 | 110 | 0.0 |
| Unit 1A/B | AN PC CMP1 | 0 | 4 | 2.5 | 55.2 | 44.8 | 88.8 | 2.5 | 1.01 | 0.41 | 2.5 | 50 | 670 | 0 | 0.6 | 5.1 | 0 | 97 | 410 | 0 | 1.00 | 110 | 0 | 2.16 | 230 | 0 | 1.36 | 110 | 0 |
| Unit 1A/B | AN PC CMP2 | 0 | 4 | 2.2 | 52.3 | 47.7 | 72.0 | 2.3 | 0.9 | 0.41 | 2.2 | 31 | 670 | 0 | 0.7 | 5.1 | 0 | 87 | 410 | 0 | 0.96 | 110 | 0 | 2.87 | 230 | 0 | 1.30 | 110 | 0 |
| Unit 1A/B | AN PC CMP3 | 0 | 4 | 2.7 | 52.5 | 47.5 | 89.4 | 2.0 | 1.1 | 0.41 | 2.7 | 43 | 670 | 0 | 0.8 | 5.1 | 0 | 100 | 410 | 0 | 1.30 | 110 | 0 | 3.55 | 230 | 0 | 1.95 | 110 | 0 |
| Unit 1A/B | AN PC CMP4 | 0 | 4 | 3.0 | 52.9 | 47.1 | 68.3 | 2.1 | 1.25 | 0.41 | 3.0 | 52 | 670 | 0 | 0.6 | 5.1 | 0 | 97 | 410 | 0 | 2.67 | 110 | 0 | 4.81 | 230 | 0 | 3.67 | 110 | 0 |
| Unit 1A/B | HC-VC-70-S1 | 0 | 1.5 | 5.6 | 55.0 | 45.0 | -- | 2.0 | 2.30 | 0.41 | 5.6 | 170 | 670 | 0 | 1.4 | 5.1 | 0 | 94 | 410 | 0 | 1.40 | 110 | 0 | 3.00 | 230 | 0 | 2.30 | 110 | 0 |
| Unit 1A/B | HC-VC-70-S2 | 3.7 | 5.8 | 0.4 | 47.0 | 53.0 | -- | 1.2 | 0.18 U | 0.41 | 0.4 | 5 E | 670 | 0 | 0.97 U | 5.1 | 0 | 72 | 410 | 0 | 3.42 U | 110 | 0 | 8.42 U | 230 | 0 | 3.50 U | 110 | 0 |
| Unit 1A/B | HC-VC-70-S3 | 1.5 | 3.7 | 0.4 | 42.0 | 58.0 | -- | -- | 0.17 U | 0.41 | 0.4 | -- nt | 670 | 0 | -- nt | 5.1 | 0 | -- nt | 410 | 0 | -- nt | 110 | 0 | -- nt | 230 | 0 | -- nt | 110 | 0 |
| **Unit 1C** | | | Average ER | 19.6 | 51.3 | 48.7 | | 3.9 | 6.7 | 0.41 | 16.2 | 709 | 670 | 1.1 | 1.5 | 5.1 | 0.0 | 122 | 410 | 0.0 | 69 | 110 | 0.0 | 85 | 230 | 0.0 | 103 | 110 | 0.0 |
| Unit 1C | HC-DC-86-S1 | 0 | 1.9 | 2.2 | 60.0 | 40.0 | -- | 2.3 | 0.24 | 0.41 | 0.00 | 150 | 670 | 0 | 1.3 U | 5.1 | 0 | 61 | 410 | 0 | 82.6 | 110 | 0 | 104.4 | 230 | 0 | 121.74 | 110 | 1.11 |
| Unit 1C | HC-DC-86-S2 | 1.9 | 3.8 | 2.3 | 55.0 | 45.0 | -- | 2.3 | 0.51 | 0.41 | 1.2 | 120 | 670 | 0 | 1.1 U | 5.1 | 0 | 73 | 410 | 0 | 78.3 | 110 | 0 | 95.7 | 230 | 0 | 100.00 | 110 | 0 |
| Unit 1C | HC-DC-87-S1* | 0 | 2.3 | 34.9 | 55.0 | 45.0 | -- | 3.4 | 1.35 | 0.41 | 3.3 | 5.85 | 670 | 0 | 1.5 | 5.1 | 0 | 190 | 410 | 0 | 217.7 | 110 | 1.98 | 323.5 | 230 | 1.41 | 411.76 | 110 | 3.74 |
| Unit 1C | HC-DC-87-S2 | 2.3 | 3.8 | 19.6 | 51.0 | 49.0 | -- | 4.2 | 7.50 | 0.41 | 18.3 | 880 | 670 | 1.31 | 2.1 | 5.1 | 0 | 150 | 410 | 0 | 73.8 | 110 | 0 | 64.3 | 230 | 0 | 88.10 | 110 | 0 |
| Unit 1C | HC-DC-88-S1 | 0 | 1.6 | 3.9 | 43.0 | 57.0 | -- | 3.7 | 0.67 | 0.41 | 1.6 | 140 | 670 | 0 | 0.9 U | 5.1 | 0 | 68 | 410 | 0 | 94.6 | 110 | 0 | 135.1 | 230 | 0 | 132.43 | 110 | 1.20 |
| Unit 1C | HC-DC-88-S2 | 1.6 | 3.8 | 6.4 | 49.0 | 51.0 | -- | 5.5 | 2.20 | 0.41 | 5.4 | 690 | 670 | 1.03 | 1.5 | 5.1 | 0 | 110 | 410 | 0 | 43.6 | 110 | 0 | 63.6 | 230 | 0 | 61.82 | 110 | 0 |
| Unit 1C | HC-DC-89-S1 | 0 | 1.6 | 19.3 | 38.0 | 62.0 | -- | 3.4 | 6.40 | 0.41 | 15.6 | 590 | 670 | 0 | 0.86 | 5.1 | 0 | 140 | 410 | 0 | 70.6 | 110 | 0 | 47.5 | 230 | 0.00 | 100.00 | 110 | 0 |
| Unit 1C | HC-DC-89-S2 | 1.6 | 3.8 | 119.8 | 56.0 | 44.0 | -- | 9.4 | 43 | 0.41 | 104.9 | 4600 | 670 | 6.87 | 2.5 | 5.1 | 0 | 230 | 410 | 0 | 29.8 | 110 | 0 | 27.7 | 230 | 0 | 30.85 | 110 | 0 |
| Unit 1C | HC-VC-71-S1 | 0 | 1.6 | 10.5 | 57.0 | 43.0 | -- | 2.7 | 4.30 | 0.41 | 10.5 | 270 | 670 | 0 | 1.3 | 5.1 | 0 | 100 | 410 | 0 | 10.0 | 110 | 0 | 11.5 | 230 | 0 | 14.07 | 110 | 0 |
| Unit 1C | HC-VC-71-S2 | 1.6 | 4.8 | 12.7 | 46.0 | 54.0 | -- | 2.6 | 4.50 | 0.41 | 11.0 | 280 | 670 | 0 | 1.5 | 5.1 | 0 | 100 | 410 | 0 | 46.2 | 110 | 0 | 46.2 | 230 | 0 | 57.69 | 110 | 0 |
| Unit 1C | HC-VC-72-S1 | 0 | 3.2 | 6.3 | 54.0 | 46.0 | -- | 3.1 | 2.60 | 0.41 | 6.3 | 73 | 670 | 0 | 1.7 | 5.1 | 0 | 120 | 410 | 0 | 11.0 | 110 | 0 | 13.6 | 230 | 0 | 14.19 | 110 | 0 |

# Table G-1. Enrichment Ratios for Contaminated Subsurface Sediments

| Unit | Sample ID | Depth Below Mudline (ft) | | Cumulative ER | Moisture | Total Solids | Total Fines | TOC | Mercury (SQS = 0.41) | | | 4-Methylphenol (SQS = 670) | | | Cadmium (SQS = 5.1) | | | Zinc (SQS = 410) | | | Benzo(a)anthracene (SQS = 110) | | | Benzofluoranthenes (SQS = 230) | | | Chrysene (SQS = 110) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Top | Bottom | (x SQS) | | (%) | (%) | (%) | Conc. (mg/kg) | SQS | Interval ER | Conc. (ug/kg) | SQS | ER | (mg/kg) | SQS | ER | Conc. (mg/kg) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | (ppm TOC) | SQS | ER |
| **Unit 2A/2B** | | | | 4.2 | 43.3 | 56.8 | | 6.5 | 0.83 | 0.41 | 2.0 | 765 | 670 | 1.1 | 1.6 | 5.1 | 0.0 | 180 | 410 | 0.0 | 30.5 | 110 | 0.0 | 43.4 | 230 | 0.0 | 38.1 | 110 | 0.0 |
| Unit 2A/B | HC-DC-91-S1 | 0 | 1.6 | 2.3 | 46.0 | 54.0 | -- | 6.1 | 0.93 | 0.41 | 2.3 | 300 | 670 | 0 | 1.4 | 5.1 | 0 | 140 | 410 | 0 | 32.8 | 110 | 0 | 47.54 | 230 | 0 | 36.07 | 110 | 0 |
| Unit 2A/B | HC-DC-91-S2 | 1.6 | 3 | 6.6 | 62.0 | 38.0 | -- | 11.0 | 1.60 | 0.41 | 3.9 | 1000 | 670 | 1.49 | 2.5 | 5.1 | 0 | 170 | 410 | 0 | 4.82 | 110 | 0 | 6.91 | 230 | 0 | 5.27 | 110 | 0 |
| Unit 2A/B | HC-DC-92-S1 | 0 | 1.4 | 5.7 | 30.0 | 70.0 | -- | 3.0 | 0.31 | 0.41 | 0.00 | 560 | 670 | 0.00 | 1.30 | 5.1 | 0.00 | 270 | 410 | 0 | 73.3 | 110 | 0 | 100.00 | 230 | 0 | 96.67 | 110 | 0 |
| Unit 2A/B | HC-DC-92-S2 | 1.4 | 2.8 | 3.0 | 35.0 | 65.0 | -- | 5.7 | 0.50 | 0.41 | 1.2 | 1200 | 670 | 1.79 | 1.2 | 5.1 | 0 | 140 | 410 | 0 | 10.9 | 110 | 0 | 19.30 | 230 | 0 | 14.39 | 110 | 0 |
| **Unit 2C** | | | | 17.3 | 55.6 | 44.4 | | 6.0 | 4.4 | 0.41 | 10.7 | 4,417 | 670 | 6.6 | 3.1 | 5.1 | 0.0 | 230.1 | 410 | 0.0 | 5.8 | 110 | 0.0 | 8.1 | 230 | 0.0 | 8.1 | 110 | 0.0 |
| Unit 2C | HC-VC-73-S1 | 0 | 1.9 | 4.9 | 62.0 | 38.0 | -- | 3.7 | 2.00 | 0.41 | 4.9 | 480 | 670 | 0 | 1.5 | 5.1 | 0 | 110 | 410 | 0 | 10.00 | 110 | 0 | 16.22 | 230 | 0 | 13.78 | 110 | 0 |
| Unit 2C | HC-VC-73-S2 | 1.9 | 4.6 | 11.7 | 53.0 | 47.0 | -- | 4.7 | 3.90 | 0.41 | 9.5 | 1500 | 670 | 2.24 | 2.3 | 5.1 | 0 | 140 | 410 | 0 | 3.83 | 110 | 0 | 4.04 | 230 | 0 | 4.68 | 110 | 0 |
| Unit 2C | HC-VC-73-S3 | 5.1 | 7.4 | 1.4 | 47.0 | 53.0 | -- | -- | 0.56 | 0.41 | 1.4 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | 0 |
| Unit 2C | HC-VC-77-S1 | 0 | 2.1 | 28.3 | 62.0 | 38.0 | -- | 4.8 | 11.00 | 0.41 | 26.8 | 1000 | 670 | 1.49 | 2 | 5.1 | 0 | 140 | 410 | 0 | 25.00 | 110 | 0 | 31.25 | 230 | 0 | 35.42 | 110 | 0 |
| Unit 2C | HC-VC-77-S2 | 2.1 | 3.9 | 18.9 | 51.0 | 49.0 | -- | 49 ** | 7.00 | 0.41 | 17.1 | 1200 | 670 | 1.79 | 1.9 | 5.1 | 0 | 120 | 410 | 0 | 0.76 | 110 | 0 | 1.10 | 230 | 0 | 1.10 | 110 | 0 |
| Unit 2C | HC-VC-78-S1 | 0 | 2.4 | 5.1 | 59.0 | 41.0 | -- | 5.6 | 2.10 | 0.41 | 5.1 | 610 | 670 | 0 | 1.8 | 5.1 | 0 | 130 | 410 | 0 | 3.57 | 110 | 0 | 6.43 | 230 | 0 | 5.18 | 110 | 0 |
| Unit 2C | HC-VC-78-S2 | 2.7 | 4 | 2.2 | 33.0 | 67.0 | -- | 2.0 | 0.42 | 0.41 | 1.0 | 810 | 670 | 1.21 | 0.81 | 5.1 | 0 | 61 | 410 | 0 | 3.65 | 110 | 0 | 3.55 | 230 | 0 | 4.05 | 110 | 0 |
| Unit 2C | HC-VC-79-S1 | 0 | 2 | 25.7 | 55.0 | 45.0 | -- | 5.7 | 8.10 | 0.41 | 19.8 | 3200 | 670 | 4.78 | 4.6 | 5.1 | 0 | 460 | 410 | 1.12 | 3.51 | 110 | 0 | 4.56 | 230 | 0 | 4.91 | 110 | 0 |
| Unit 2C | HC-VC-79-S2 | 2 | 3.8 | 11.8 | 46.0 | 54.0 | -- | 4.5 | 2.20 | 0.41 | 5.4 | 3400 | 670 | 5.07 | 4.7 | 5.1 | 0 | 570 | 410 | 1.39 | 5.33 | 110 | 0 | 6.89 | 230 | 0 | 7.11 | 110 | 0 |
| Unit 2C | HC-VC-80-S1 | 0 | 1.7 | 8.3 | 58.0 | 42.0 | -- | 4.5 | 1.00 | 0.41 | 2.4 | 3200 | 670 | 4.78 | 2 | 5.1 | 0 | 150 | 410 | 0 | 9.11 | 110 | 0 | 15.33 | 230 | 0 | 12.22 | 110 | 0 |
| Unit 2C | HC-VC-80-S2 | 1.9 | 5.3 | 65.9 | 71.0 | 29.0 | -- | 14.0 | 12.00 | 0.41 | 29.3 | 21000 | 670 | 31.34 | 5.6 | 5.1 | 1.1 | 280 | 410 | 0 | 1.07 | 110 | 0 | 3.29 | 230 | 0 | 4.43 | 110 | 0 |
| HC-VC-96 | HC-VC-96-C1 | 0 | 3.62 | 14.5 | 59.0 | 41.0 | -- | 5.8 | 2.70 | 0.41 | 6.6 | 4600 | 670 | 6.87 | 3.4 | 5.1 | 0.0 | 280 | 410 | 0 | 2.60 | 110 | 0.00 | 3.38 | 230 | 0 | 3.28 | 110 | 0.00 |
| HC-VC-96 | HC-VC-96-C2 | 3.62 | 10.03 | 31.2 | 67.0 | 33.0 | -- | 11.0 | 4.30 | 0.41 | 10.5 | 12000 | 670 | 17.91 | 6.1 | 5.1 | 1.2 | 320 | 410 | 0 | 1.10 | 110 | 0.00 | 1.10 E | 230 | 0 | 1.50 | 110 | 0.00 |
| **Unit 3A** | | | | 13.5 | 54.3 | 45.8 | | 6.8 | 1.2 | 0.41 | 3.0 | 7,053 | 670 | 10.5 | 2.1 | 5.1 | 0.0 | 300 | 410 | 0.0 | 6.2 | 110 | 0.0 | 10.9 | 230 | 0.0 | 9.1 | 110 | 0.0 |
| Unit 3C | HC-DC-93-S1 | 0 | 2 | 1.1 | 31.0 | 69.0 | -- | 2.6 | 0.14 U | 0.41 | 0 | 58 | 670 | 0.00 | 0.77 U | 5.1 | 0 | 440 | 410 | 1.07 | 6.54 U | 110 | — | 13.46 | 230 | 0 | 10.00 | 110 | 0 |
| Unit 3C | HC-VC-82-S1 | 0 | 2.3 | 8.0 | 59.0 | 41.0 | -- | 6.7 | 1.40 | 0.41 | 3.4 | 3100 | 670 | 4.63 | 2.3 | 5.1 | 0 | 210 | 410 | 0 | 7.46 | 110 | 0 | 12.69 | 230 | 0 | 10.60 | 110 | 0 |
| Unit 3C | HC-VC-82-S2 | 2.3 | 5.2 | 34.8 | 65.0 | 35.0 | -- | 11.0 | 2.00 | 0.41 | 4.9 | 18000 | 670 | 26.87 | 3.1 | 5.1 | 0 | 250 | 410 | 0 | 4.73 | 110 | 0 | 6.45 | 230 | 0 | 6.82 | 110 | 0 |
| Unit 3C | HC-VC-82-S3 | 5.3 | 6.8 | 3.2 | 62.0 | 38.0 | -- | -- | 1.30 | 0.41 | 3.2 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| **Unit 3B** | | | | 10.7 | 56.8 | 43.3 | | 5.7 | 1.6 | 0.41 | 3.9 | 4,550 | 670 | 6.8 | 2.1 | 5.1 | 0.0 | 195.0 | 410 | 0.0 | 10.4 | 110 | 0.0 | 16.4 | 230 | 0.0 | 15.0 | 110 | 0.0 |
| Unit 3B | HC-VC-97-C1 | 0 | 4.15 | 10.2 | 57.0 | 43.0 | -- | 5.7 | 1.80 | 0.41 | 4.4 | 3900 | 670 | 5.82 | 1.7 | 5.1 | 0 | 190 | 410 | 0 | 4.60 | 110 | 0.00 | 6.84 | 230 | 0 | 6.32 | 110 | 0.00 |
| Unit 3B | HC-VC-97-C2 | 4.15 | 8.025 | | 56.0 | 44.0 | -- | 7.6 | 2.50 | 0.41 | 6.1 | 7600 | 670 | 11.34 | 2.7 | 5.1 | 0 | 220 | 410 | 0 | 4.10 | 110 | 0.00 | 4.50 | 230 | 0 | 5.00 | 110 | 0.00 |
| Unit 3B | HC-VC-81-S1 | 0 | 1.6 | 3.9 | 56.0 | 44.0 | -- | 4.0 | 0.93 | 0.41 | 2.3 | 1100 | 670 | 1.64 | 1.6 | 5.1 | 0 | 160 | 410 | 0 | 17.75 | 110 | 0 | 32.50 | 230 | 0 | 25.00 | 110 | 0 |
| Unit 3B | HC-VC-81-S2 | 1.6 | 3.2 | 12.3 | 58.0 | 42.0 | -- | 5.5 | 1.20 | 0.41 | 2.9 | 5600 | 670 | 8.36 | 2.3 | 5.1 | 0 | 210 | 410 | 0 | 15.27 | 110 | 0 | 21.82 | 230 | 0 | 23.64 | 110 | 0 |
| **Log Pond** | | | | 36.2 | 63.6 | 36.4 | | 10.4 | 14.0 | 0.41 | 34.3 | 1304 | 670 | 1.9 | 2.0 | 5.1 | 0.0 | 180 | 410 | 0.0 | 7.7 | 110 | 0.0 | 10.3 | 230 | 0.0 | 9.5 | 110 | 0.0 |
| Log Pond | HC-DC-90-S1 | 0 | 1.6 | 13.8 | 62.0 | 38.0 | -- | 8.0 | 3.80 | 0.41 | 9.3 | 1200 | 670 | 1.79 | 2.5 | 5.1 | 0 | 210 | 410 | 0 | 10.75 | 110 | 0 | 15.00 | 230 | 0 | 12.13 | 110 | 0 |
| Log Pond | HC-DC-90-S2 | 1.6 | 3.8 | 36.3 | 65.0 | 35.0 | -- | 12.0 | 12.00 | 0.41 | 29.3 | 2900 | 670 | 4.33 | 2.7 | 5.1 | 0 | 310 | 410 | 0 | 8.33 | 110 | 0 | 8.08 | 230 | 0 | 10.00 | 110 | 0 |
| Log Pond | HC-VC-74-S1 | 0 | 2.4 | 25.6 | 67.0 | 33.0 | -- | 15.0 | 10.50 | 0.41 | 25.6 | 360 | 670 | 0 | 1.6 U | 5.1 | 0 | 130 | 410 | 0 | 10.67 | 110 | 0 | 20.67 | 230 | 0 | 12.67 | 110 | 0 |
| Log Pond | HC-VC-74-S2 | 2.4 | 4.1 | 168.3 | 64.0 | 36.0 | -- | -- | 69.00 | 0.41 | 168.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Log Pond | HC-VC-74-S3 | 4.5 | 6.9 | 24.6 | 60.0 | 40.0 | -- | 6.6 | 8.40 | 0.41 | 20.5 | 1900 | 670 | 2.84 | 2.6 | 5.1 | 0 | 240 | 410 | 0 | 10.00 | 110 | 0 | 10.45 | 230 | 0 | 12.12 | 110 | 0 |
| Log Pond | HC-VC-75-S1 | 0 | 3.3 | 16.8 | 63.0 | 37.0 | -- | 12.0 | 6.40 | 0.41 | 15.6 | 830 | 670 | 1.24 | 1.6 | 5.1 | 0 | 130 | 410 | 0 | 5.35 | 110 | 0 | 6.67 | 230 | 0 | 7.98 | 110 | 0 |
| Log Pond | HC-VC-76-S1 | 0 | 3.5 | 3.2 | 69.0 | 31.0 | -- | 10.0 | 1.30 | 0.41 | 3.2 | 440 | 670 | 0.00 | 1.8 | 5.1 | 0 | 140 | 410 | 0 | 4.50 | 110 | 0 | 6.30 | 230 | 0 | 6.30 | 110 | 0 |
| Log Pond | HC-VC-76-S2 | 3.5 | 7.9 | 4.6 | 59.0 | 41.0 | -- | 9.5 | 0.96 | 0.41 | 2.3 | 1500 | 670 | 2.24 | 1.3 | 5.1 | 0 | 100 | 410 | 0 | 4.21 | 110 | 0 | 4.74 | 230 | 0 | 5.58 | 110 | 0 |
| **I&J Waterway** | | | | 5.4 | 47.4 | 52.6 | | 4.2 | 1.36 | 0.41 | 3.3 | 235 | 670 | 0.0 | 1.28 | 5.1 | 0.0 | 94.8 | 410 | 0.0 | 2.25 | 110 | 0.0 | 3.34 | 230 | 0.0 | 2.79 | 110 | 0.0 |
| HC-VC-83 | HC-VC-83-S1 | 0 | 2.6 | 3.5 | 54.0 | 46.0 | -- | 3.8 | 1.40 | 0.41 | 3.4 | 160 | 670 | 0.00 | 1.4 | 5.1 | 0 | 110 | 410 | 0 | 2.17 | 110 | 0.00 | 3.95 | 230 | 0 | 2.89 | 110 | 0.03 |
| HC-VC-83 | HC-VC-83-S3 | 2.6 | 5.3 | 7.8 | 52.0 | 48.0 | -- | -- | 3.20 | 0.41 | 7.8 | -- nt | 670 | 0.00 | -- nt | 5.1 | 0 | -- nt | 410 | 0 | -- nt | 110 | 0.00 | -- nt | 230 | 0 | -- nt | 110 | 0.03 |
| HC-VC-84 | HC-VC-84-S1 | 0 | 1.4 | 2.0 | 51.0 | 49.0 | -- | 2.9 | 0.65 | 0.41 | 1.6 | 100 | 670 | 0.00 | 1.1 | 5.1 | 0 | 100 | 410 | 0 | 7.51 | 110 | 0.07 | 4.14 | 230 | 0 | 3.24 J | 110 | 0.03 |
| HC-VC-84 | HC-VC-84-S2 | 2 | 4.9 | 5.4 | 49.0 | 51.0 | -- | 7.0 | 2.20 | 0.41 | 5.4 | 490 | 670 | 0 | 2.1 | 5.1 | 0 | 140 | 410 | 0 | 1.05 | 110 | 0.00 | 2.43 | 230 | 0 | 2.43 J | 110 | 0.00 |
| HC-VC-85 | HC-VC-85-S1 | 0 | 4.5 | 2.3 | 57.0 | 43.0 | -- | 4.2 | 0.88 | 0.41 | 2.1 | 200 | 670 | 0 | 1.4 | 5.1 | 0 | 130 | 410 | 0 | 2.25 | 110 | 0.00 | 12.14 | 230 | 0 | 10.24 J | 110 | 0.09 |
| HC-VC-94 | HC-VC-94-C1 | 0 | 3.56 | 3.2 | 47.0 | 53.0 | -- | 2.3 | 1.30 | 0.41 | 3.2 | 130 | 670 | 0.00 | 1.1 | 5.1 | 0 | 83 | 410 | 0 | 1.10 J | 110 | 0.00 | 1.70 | 230 | 0 | 1.39 J | 110 | 0.00 |
| HC-VC-94 | HC-VC-94-C2 | 3.56 | 6.77 | 4.4 | 53.0 | 47.0 | -- | 2.9 | 1.80 | 0.41 | 4.4 | 78 | 670 | 0.00 | 1.6 | 5.1 | 0 | 89 | 410 | 0 | 1.60 U | 110 | 0.00 | 0.79 E | 230 | 0 | 0.59 E | 110 | 0.00 |
| HC-VC-95 | HC-VC-95-C1 | 0 | 2.55 | 1.7 | 40.0 | 60.0 | -- | 5.3 | 0.68 | 0.41 | 1.7 | 460 | 670 | 0.00 | 0.85 U | 5.1 | 0 | 69 | 410 | 0 | 0.82 U | 110 | 0.00 | 0.83 | 230 | 0 | 1.06 | 110 | 0.00 |
| HC-VC-95 | HC-VC-95-C2 | 2.55 | 4.87 | 1.9 | 24.0 | 76.0 | -- | 4.8 | 0.15 | 0.41 | 0.4 | 260 | 670 | 0.00 | 0.67 U | 5.1 | 0 | 37 | 410 | 0 | 1.47 U | 110 | 0.00 | 0.73 | 230 | 0 | 0.46 J | 110 | 0.00 |

**Notes:**

U = Compound not detected at the indicated reporting limit.

— Not tested in this sample.

*: Multiple PAH compounds exceeded the SQS in this sample, but all PAH compounds were below the SQS in a matching duplicate sample, indicating that the PAH contamination is extremely localized in this area.

**: Value is an outlier. Not included in average calculation.

Pre 1996 Data excluded from analysis

Averages for subsurface sediment based on estimated 0.4 to 4.0 ft interval, using adjusted depth intervals as indicated.

For compounds with a measured concentration below the SQS, the ER for that compound was assigned a value of zero.

Enrichment calculated only for compounds detected above SQS in at least 2 or more samples, or in samples at ER values of greater than 2X. ER values not calculated for pentachlorophenol, benzoic acid and di-n-octylphthalate based on these criteria.

Dioxins not included in enrichment ratio calculations, because SQS values are not available for these compounds. Dioxins were elevated within the ASB sludges.

# Table G-1. Enrichment Ratios for Contaminated Subsurface Sediments

| Unit | Sample ID | Depth Below Mudline (ft) | | Dibenz(a,h)anthracene (SQS = 12) | | | Fluoranthene (SQS = 160) | | | Pyrene (SQS = 1000) | | | Acenapthene (SQS = 16) | | | Fluorene (SQS = 23) | | | Naphthalene (SQS = 99) | | | Phenanthrene (SQS = 100) | | | Dibenzofuran (SQS = 15) | | | Hexachlorobenzene (SQS = 0.38) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Top | Bottom | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER |
| **ASB Sludges** | | | | **0.7** | 12 | **0.0** | **16.7** | 160 | **0.0** | **16.8** | 1000 | **0.0** | **1.4** | 16 | **0.0** | **1.0** | 23 | **0.00** | **28.2** | 99 | **0.0** | **17.6** | 100 | **0.0** | **0.0** | 15 | **0.0** | **0.003** | 0.38 | **0.0** |
| ASB Sludges | GPA-01-A | 0 | 6 | 0.09 U | 12 | 0.00 | 7.88 | 160 | 0.00 | 5.8 | 1000 | 0.00 | 0.7 | 16 | 0.00 | 0.8 | 23 | 0.00 | 23.6 | 99 | 0.00 | 10.3 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.003 U | 0.38 | 0.00 |
| ASB Sludges | GPA-01-B1 | 6.5 | 11.5 | 0.08 U | 12 | 0.00 | 6.18 | 160 | 0.00 | 5.3 M | 1000 | 0.00 | 0.7 | 16 | 0.00 | 0.8 | 23 | 0.00 | 16.5 | 99 | 0.00 | 8.2 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.003 U | 0.38 | 0.00 |
| ASB Sludges | GPA-02-A | 0 | 2.1 | 0.09 U | 12 | 0.00 | 2.97 | 160 | 0.00 | 2.3 | 1000 | 0.00 | 1.1 | 16 | 0.00 | 0.4 | 23 | 0.00 | 48.4 | 99 | 0.00 | 4.8 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.003 U | 0.38 | 0.00 |
| ASB Sludges | GPA-02-B1 | 2.1 | 4 | 5.71 | 12 | 0.00 | 114.29 | 160 | 0.00 | 114.3 | 1000 | 0.00 | 7.9 | 16 | 0.00 | 4.3 | 23 | 0.00 | 121.4 | 99 | **1.23** | 107.1 | 100 | **1.07** | 0.0 nt | 15 | 0.00 | 0.004 U | 0.38 | 0.00 |
| ASB Sludges | GPA-02-B2 | 4 | 8.5 | 0.09 U | 12 | 0.00 | 0.66 | 160 | 0.00 | 0.7 | 1000 | 0.00 | 0.1 U | 16 | 0.00 | 0.1 U | 23 | 0.00 | 0.1 U | 99 | 0.00 | 0.6 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.003 U | 0.38 | 0.00 |
| ASB Sludges | GPA-03-A | 0 | 2.6 | 0.10 U | 12 | 0.00 | 3.31 | 160 | 0.00 | 2.4 | 1000 | 0.00 | 0.8 | 16 | 0.00 | 0.7 | 23 | 0.00 | 19.7 | 99 | 0.00 | 5.2 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.003 U | 0.38 | 0.00 |
| ASB Sludges | GPA-03-B1 | 2.7 | 5 | 0.09 U | 12 | 0.00 | 6.13 | 160 | 0.00 | 5.5 | 1000 | 0.00 | 1.5 | 16 | 0.00 | 1.0 | 23 | 0.00 | 21.3 | 99 | 0.00 | 9.0 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.006 P | 0.38 | 0.00 |
| ASB Sludges | GPA-04-A | 0 | 4 | 0.06 U | 12 | 0.00 | 4.77 | 160 | 0.00 | 5.0 | 1000 | 0.00 | 0.4 | 16 | 0.00 | 0.3 | 23 | 0.00 | 10.9 | 99 | 0.00 | 5.9 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.002 U | 0.38 | 0.00 |
| ASB Sludges | GPA-04-B1 | 4.5 | 7 | 0.22 U | 12 | 0.00 | 20.95 | 160 | 0.00 | 26.2 | 1000 | 0.00 | 1.1 | 16 | 0.00 | 1.5 | 23 | 0.00 | 15.2 | 99 | 0.00 | 23.8 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.002 U | 0.38 | 0.00 |
| ASB Sludges | GPA-05-A | 0 | 6.5 | 0.10 U | 12 | 0.00 | 0.36 | 160 | 0.00 | 0.4 | 1000 | 0.00 | 0.1 U | 16 | 0.00 | 0.1 U | 23 | 0.00 | 5.4 | 99 | 0.00 | 0.5 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.004 U | 0.38 | 0.00 |
| **ASB - Sludge Native Contact** | | | | **0.2** | 12 | **0.0** | **14.8** | 160 | **0.0** | **12.2** | 1000 | **0.0** | **1.4** | 16 | **0.0** | **1.1** | 23 | **0.0** | **15.6** | 99 | **0.0** | **14.7** | 100 | **0.0** | **0.0** | 15 | **0.0** | **0.04** | | **0.0** |
| ASB - Contact | GPA-01-B2 | 13 | 19 | 0.26 U | 12 | 0.00 | 12.73 | 160 | 0.00 | 10.9 | 1000 | 0.00 | 0.9 | 16 | 0.00 | 0.3 U | 23 | 0.00 | 11.8 | 99 | 0.00 | 13.2 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.044 U | 0.38 | 0.00 |
| ASB - Contact | GPA-03-B2 | 5.5 | 9 | 0.21 U | 12 | 0.00 | 22.59 | 160 | 0.00 | 18.1 | 1000 | 0.00 | 1.7 | 16 | 0.00 | 1.5 | 23 | 0.00 | 22.6 | 99 | 0.00 | 21.5 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.034 U | 0.38 | 0.00 |
| ASB - Contact | GPA-05-B1 | 7.5 | 13 | 0.28 U | 12 | 0.00 | 9.00 | 160 | 0.00 | 7.5 M | 1000 | 0.00 | 1.6 | 16 | 0.00 | 1.6 U | 23 | 0.00 | 12.5 | 99 | 0.00 | 9.5 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.047 U | 0.38 | 0.00 |
| **ASB - Native Sediments** | | | | **1.3** U | 12 | **0.0** | **11.8** U | 160 | **0.0** | **10.3** | 1000 | **0.0** | **1.2** U | 16 | **0.0** | **1.5** U | 23 | **0.0** | **13.2** | 99 | **0.0** | **11.6** | 100 | **0.0** | **0.0** | 15 | **0.0** | **0.21** U | 0.38 | **0.0** |
| ASB Native | GPA-01-C | 26 | 32 | 1.40 U | 12 | 0.00 | 1.45 U | 160 | 0.00 | 2.5 | 1000 | 0.00 | 1.3 U | 16 | 0.00 | 1.6 U | 23 | 0.00 | 1.3 U | 99 | 0.00 | 1.1 U | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.24 U | 0.38 | 0.00 |
| ASB Native | GPA-02-C | 9 | 14 | 0.92 U | 12 | 0.00 | 15.67 U | 160 | 0.00 | 14.3 | 1000 | 0.00 | 0.8 U | 16 | 0.00 | 1.1 U | 23 | 0.00 | 16.7 | 99 | 0.00 | 15.5 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.16 U | 0.38 | 0.00 |
| ASB Native | GPA-03-C | 12 | 17.5 | 1.90 U | 12 | 0.00 | 23.00 U | 160 | 0.00 | 18.0 | 1000 | 0.00 | 1.7 U | 16 | 0.00 | 2.2 U | 23 | 0.00 | 15.0 | 99 | 0.00 | 20.0 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.31 U | 0.38 | 0.00 |
| ASB Native | GPA-04-B2 | 8.5 | 13.5 | 0.56 U | 12 | 0.00 | 18.00 U | 160 | 0.00 | 16.0 | 1000 | 0.00 | 0.5 U | 16 | 0.00 | 0.7 U | 23 | 0.00 | 12.0 | 99 | 0.00 | 17.0 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.09 U | 0.38 | 0.00 |
| ASB Native | GPA-04-C | 18.5 | 23.5 | 1.87 U | 12 | 0.00 | 8.67 U | 160 | 0.00 | 7.7 | 1000 | 0.00 | 1.7 U | 16 | 0.00 | 2.2 U | 23 | 0.00 | 8.7 | 99 | 0.00 | 9.3 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.30 U | 0.38 | 0.00 |
| ASB Native | GPA-05-B2 | 14 | 17.5 | 1.40 U | 12 | 0.00 | 11.00 U | 160 | 0.00 | 9.8 | 1000 | 0.00 | 1.3 U | 16 | 0.00 | 1.7 U | 23 | 0.00 | 19.0 | 99 | 0.00 | 11.5 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.23 U | 0.38 | 0.00 |
| ASB Native | GPA-05-C | 19 | 23 | 0.95 U | 12 | 0.00 | 4.67 U | 160 | 0.00 | 4.0 | 1000 | 0.00 | 0.9 U | 16 | 0.00 | 1.1 U | 23 | 0.00 | 20.0 | 99 | 0.00 | 6.7 | 100 | 0.00 | 0.0 nt | 15 | 0.00 | 0.16 U | 0.38 | 0.00 |
| **ASB - Berm Sands** | | | | **15.1** U | 12 | **0.0** | **15.1** U | 160 | **0.0** | **15.1** U | 1000 | **0.0** | **15.1** U | 16 | **0.0** | **15.1** U | 23 | **0.0** | **15.1** U | 99 | **0.0** | **15.1** U | 100 | **0.0** | **15.1** U | 15 | **0.0** | **15.1** U | 0.38 | **0.0** |
| ASB Berm | BERM-01-10-16 | 10 | 16 | 11.11 U | 12 | 0.0 | 11.11 U | 160 | 0.0 | 11.1 U | 1000 | 0.0 | 11.1 U | 16 | 0.0 | 11.1 U | 23 | 0.0 | 11.1 U | 99 | 0.0 | 11.1 U | 100 | 0.0 | 11.1 U | 15 | 0.0 | 11.1 U | 0.38 | 0.0 |
| ASB Berm | BERM-02-10-16 | 10 | 16 | 22.73 U | 12 | 0.0 | 22.73 U | 160 | 0.0 | 22.7 U | 1000 | 0.0 | 22.7 U | 16 | 0.0 | 22.7 U | 23 | 0.0 | 22.7 U | 99 | 0.0 | 22.7 U | 100 | 0.0 | 22.7 U | 15 | 0.0 | 22.7 U | 0.38 | 0.0 |
| ASB Berm | BERM-03-10-16 | 10 | 16 | 20.88 U | 12 | 0.0 | 20.88 U | 160 | 0.0 | 20.9 U | 1000 | 0.0 | 20.9 U | 16 | 0.0 | 20.9 U | 23 | 0.0 | 20.9 U | 99 | 0.0 | 20.9 U | 100 | 0.0 | 20.9 U | 15 | 0.0 | 20.9 U | 0.38 | 0.0 |
| ASB Berm | BERM-04-8-14 | 8 | 14 | 14.96 U | 12 | 0.0 | 14.96 U | 160 | 0.0 | 15.0 U | 1000 | 0.0 | 15.0 U | 16 | 0.0 | 15.0 U | 23 | 0.0 | 15.0 U | 99 | 0.0 | 15.0 U | 100 | 0.0 | 15.0 U | 15 | 0.0 | 15.0 U | 0.38 | 0.0 |
| ASB Berm | BERM-05-8-14 | 8 | 14 | 14.29 U | 12 | 0.0 | 14.29 U | 160 | 0.0 | 14.3 U | 1000 | 0.0 | 14.3 U | 16 | 0.0 | 14.3 U | 23 | 0.0 | 14.3 U | 99 | 0.0 | 14.3 U | 100 | 0.0 | 14.3 U | 15 | 0.0 | 14.3 U | 0.38 | 0.0 |
| ASB Berm | BERM-06-10-16 | 10 | 16 | 15.83 U | 12 | 0.0 | 15.83 U | 160 | 0.0 | 15.8 U | 1000 | 0.0 | 15.8 U | 16 | 0.0 | 15.8 U | 23 | 0.0 | 15.8 U | 99 | 0.0 | 15.8 U | 100 | 0.0 | 15.8 U | 15 | 0.0 | 15.8 U | 0.38 | 0.0 |
| ASB Berm | BERM-07-7-11 | 7 | 11 | 14.84 U | 12 | 0.0 | 14.84 U | 160 | 0.0 | 14.8 U | 1000 | 0.0 | 14.8 U | 16 | 0.0 | 14.8 U | 23 | 0.0 | 14.8 U | 99 | 0.0 | 14.8 U | 100 | 0.0 | 14.8 U | 15 | 0.0 | 14.8 U | 0.38 | 0.0 |
| ASB Berm | BERM-08-10-14 | 10 | 14 | 5.94 U | 12 | 0.0 | 5.94 U | 160 | 0.0 | 5.9 U | 1000 | 0.0 | 5.9 U | 16 | 0.0 | 5.9 U | 23 | 0.0 | 5.9 U | 99 | 0.0 | 5.9 U | 100 | 0.0 | 5.9 U | 15 | 0.0 | 5.9 U | 0.38 | 0.0 |
| **Whatcom Waterway Sediments Average (Excluding Log Pond & I&J Waterway)** | | | | **3.7** | 12 | **0.0** | **75.3** | 160 | **0.0** | **76.5** | 1000 | **0.0** | **6.6** | 16 | **0.0** | **8.1** | 23 | **0.0** | **11.6** | 99 | **0.0** | **35.6** | 100 | **0.0** | **6.0** | 15 | **0.0** | **0.21** | 0.38 | **0.0** |
| **Unit 1A/B** | | | | **2.0** | 12 | **0.0** | **3.9** | 160 | **0.0** | **4.4** | 1000 | **0.0** | **1.3** | 16 | **0.0** | **1.2** | 23 | **0.0** | **2.4** | 99 | **0.0** | **3.1** | 100 | **0.0** | **1.2** | 15 | **0.0** | **0.14** | 0.38 | **0.0** |
| Unit 1A/B | AN PC CMP1 | 0 | 4 | 0.80 U | 12 | 0 | 3.08 | 160 | 0 | 2.68 | 1000 | 0 | 0.80 U | 16 | 0 | 0.80 U | 23 | 0 | 1.44 | 99 | 0 | 2.36 | 100 | 0 | 0.60 J | 15 | 0 | 0.08 | 0.38 | 0 |
| Unit 1A/B | AN PC CMP2 | 0 | 4 | 0.87 U | 12 | 0 | 2.96 | 160 | 0 | 2.91 | 1000 | 0 | 0.87 U | 16 | 0 | 0.87 U | 23 | 0 | 1.26 | 99 | 0 | 2.00 | 100 | 0 | 0.87 U | 15 | 0 | 0.07 | 0.38 | 0 |
| Unit 1A/B | AN PC CMP3 | 0 | 4 | 0.95 U | 12 | 0 | 4.05 | 160 | 0 | 4.60 | 1000 | 0 | 0.95 U | 16 | 0 | 0.95 U | 23 | 0 | 1.85 | 99 | 0 | 3.25 | 100 | 0 | 0.95 J | 15 | 0 | 0.12 | 0.38 | 0 |
| Unit 1A/B | AN PC CMP4 | 0 | 4 | 0.95 U | 12 | 0 | 7.14 | 160 | 0 | 7.14 | 1000 | 0 | 0.71 J | 16 | 0 | 1.10 | 23 | 0 | 2.43 | 99 | 0 | 4.48 | 100 | 0 | 1.10 | 15 | 0 | 0.08 | 0.38 | 0 |
| Unit 1A/B | HC-VC-70-S1 | 0 | 1.5 | 3.40 U | 12 | 0 | 3.20 | 160 | 0 | 5.50 | 1000 | 0 | 1.9 U | 16 | 0 | 0.6 E | 23 | 0 | 4.55 | 99 | 0 | 3.40 | 100 | 0 | 0.85 E | 15 | 0 | 0.21 | 0.38 | 0 |
| Unit 1A/B | HC-VC-70-S2 | 3.7 | 5.8 | 4.83 U | 12 | 0 | 2.92 U | 160 | 0 | 3.67 | 1000 | 0 | 2.67 U | 16 | 0 | 3.08 U | 23 | 0 | 2.67 U | 99 | 0 | 3.08 U | 100 | 0 | 2.75 U | 15 | 0 | 0.26 U | 0.38 | 0 |
| Unit 1A/B | HC-VC-70-S3 | 1.5 | 3.7 | -- nt | 12 | 0 | -- nt | 160 | 0 | -- nt | 1000 | 0 | -- nt | 16 | 0 | -- nt | 23 | 0 | -- nt | 99 | 0 | -- nt | 100 | 0 | -- nt | 15 | 0 | -- nt | 0.38 | 0 |
| **Unit 1C** | | Average ER | | **8.6** | 12 | **0.0** | **224** | 160 | **1.4** | **217** | 1000 | **0.0** | **14.6** | 16 | **0.0** | **17** | 23 | **0.0** | **14** | 99 | **0.0** | **94** | 100 | **0.9** | **12** | 15 | **0.0** | **0.21** | 0.38 | **0.0** |
| Unit 1C | HC-DC-86-S1 | 0 | 1.9 | 13.04 | 12 | 1.09 | 139 | 160 | 0 | 152 | 1000 | 0 | 8.7 | 16 | 0 | 16.5 | 23 | 0 | 6.52 | 99 | 0 | 60.9 | 100 | 0 | 9.57 | 15 | 0 | 0.18 | 0.38 | 0 |
| Unit 1C | HC-DC-86-S2 | 1.9 | 3.8 | 12.61 | 12 | 1.05 | 122 | 160 | 0 | 126 | 1000 | 0 | 5.65 | 16 | 0 | 8.7 | 23 | 0 | 3.39 | 99 | 0 | 22.2 | 100 | 0 | 4.17 | 15 | 0 | 0.16 | 0.38 | 0 |
| Unit 1C | HC-DC-87-S1* | 0 | 2.3 | 18.53 | 12 | 1.54 | 1441 | 160 | 9.01 | 1206 | 1000 | 1.21 | 26.2 | 16 | 1.6 | 49.0 | 23 | 2.13 | 14.7 | 99 | 0 | 640 | 100 | 6.40 | 38.2 | 15 | 2.55 | 0.23 | 0.38 | 0 |
| Unit 1C | HC-DC-87-S2 | 2.3 | 3.8 | 6.19 | 12 | 0 | 160 | 160 | 0 | 181 | 1000 | 0 | 14.7 | 16 | 0.0 | 15.7 | 23 | 0 | 19.3 | 99 | 0 | 40.5 | 100 | 0 | 10.2 | 15 | 0 | 0.13 | 0.38 | 0 |
| Unit 1C | HC-DC-88-S1 | 0 | 1.6 | 10.27 | 12 | 0 | 168 | 160 | 1.05 | 246 | 1000 | 0 | 5.41 | 16 | 0.0 | 12.4 | 23 | 0 | 9.46 | 99 | 0 | 43.2 | 100 | 0 | 7.3 | 15 | 0 | 0.08 | 0.38 | 0 |
| Unit 1C | HC-DC-88-S2 | 1.6 | 3.8 | 6.73 | 12 | 0 | 85.5 | 160 | 0 | 0.84 U | 1000 | 0 | 12 | 16 | 0.0 | 12.6 | 23 | 0 | 12.4 | 99 | 0 | 34.6 | 100 | 0 | 7.82 | 15 | 0 | 0.15 | 0.38 | 0 |
| Unit 1C | HC-DC-89-S1 | 0 | 1.6 | 14.41 | 12 | 1.20 | 73.5 | 160 | 0 | 182 | 1000 | 0 | 17.4 | 16 | 1.1 | 15 | 23 | 0 | 17.4 | 99 | 0 | 50.0 | 100 | 0 | 11.2 | 15 | 0 | 0.24 | 0.38 | 0 |
| Unit 1C | HC-DC-89-S2 | 1.6 | 3.8 | 2.23 | 12 | 0 | 138 | 160 | 0 | 138 | 1000 | 0 | 36.2 | 16 | 2.3 | 30.9 | 23 | 1.34 | 34.0 | 99 | 0 | 66.0 | 100 | 0 | 22.3 | 15 | 1.49 | 0.65 | 0.38 | 1.71 |
| Unit 1C | HC-VC-71-S1 | 0 | 1.6 | 2.70 | 12 | 0 | 15.9 | 160 | 0 | 24.1 | 1000 | 0 | 1.33 | 16 | 0.0 | 2.15 | 23 | 0 | 2.15 | 99 | 0 | 3.52 | 100 | 0 | 1.63 | 15 | 0 | 0.14 U | 0.38 | 0 |
| Unit 1C | HC-VC-71-S2 | 1.6 | 4.8 | 6.15 | 12 | 0 | 92.3 | 160 | 0 | 88.5 | 1000 | 0 | 28.1 | 16 | 1.8 | 21.9 | 23 | 0 | 13.5 | 99 | 0 | 57.7 | 100 | 0 | 11.9 | 15 | 0 | 0.12 U | 0.38 | 0 |
| Unit 1C | HC-VC-72-S1 | 0 | 3.2 | 2.06 | 12 | 0 | 31.0 | 160 | 0 | 38.7 | 1000 | 0 | 5.48 | 16 | 0 | 7.42 | 23 | 0 | 16.8 | 99 | 0 | 20.0 | 100 | 0 | 5.16 | 15 | 0 | 0.19 | 0.38 | 0 |

# Table G-1. Enrichment Ratios for Contaminated Subsurface Sediments

| Unit | Sample ID | Depth Below Mudline (ft) | | Dibenz(a,h)anthracene (SQS = 12) | | | Fluoranthene (SQS = 160) | | | Pyrene (SQS = 1000) | | | Acenapthene (SQS = 16) | | | Fluorene (SQS = 23) | | | Naphthalene (SQS = 99) | | | Phenanthrene (SQS = 100) | | | Dibenzofuran (SQS = 15) | | | Hexachlorobenzene (SQS = 0.38) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Top | Bottom | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER |
| **Unit 2A/2B** | | | | **3.67** | 12 | **0.0** | **75** | 160 | **0.0** | **99** | 1000 | **0.0** | **9.06** | 16 | **0.0** | **9.8** | 23 | **0.0** | **27.3** | 99 | **0.0** | **33.6** | 100 | **0.0** | **11.4** | 15 | **0.0** | **0.40** | 0.38 | **1.04** |
| Unit 2A/B | HC-DC-91-S1 | 0 | 1.6 | 4.43 | 12 | 0 | 44.3 | 160 | 0 | 118 | 1000 | 0 | 6.89 | 16 | 0 | 7.87 | 23 | 0 | 8.36 | 99 | 0 | 21.3 | 100 | 0 | 7.87 | 15 | 0 | 0.25 | 0.38 | 0 |
| Unit 2A/B | HC-DC-91-S2 | 1.6 | 3 | 0.25 | 12 | 0 | 15.5 | 160 | 0 | 19.1 | 1000 | 0 | 1.91 | 16 | 0 | 2.73 | 23 | 0 | 3.27 | 99 | 0 | 6.2 | 100 | 0 | 2.18 | 15 | 0 | 0.47 | 0.38 | 1.24 |
| Unit 2A/B | HC-DC-92-S1 | 0 | 1.4 | 9.33 | 12 | 0 | 203 | 160 | 1.27 | 203 | 1000 | 0 | 22.33 | 16 | 1.40 | 22.3 | 23 | 0 | 46.7 | 99 | 0 | 70.0 | 100 | 0 | 24.3 | 15 | 1.62 | 0.53 | 0.38 | 1.39 |
| Unit 2A/B | HC-DC-92-S2 | 1.4 | 2.8 | 0.65 | 12 | 0 | 35.1 | 160 | 0 | 54.4 | 1000 | 0 | 5.09 | 16 | 0 | 6.32 | 23 | 0 | 50.9 | 99 | 0 | 36.8 | 100 | 0 | 11.4 | 15 | 0 | 0.33 | 0.38 | 0 |
| **Unit 2C** | | | | **1.6** | 12 | **0.0** | **12.9** | 160 | **0.0** | **13.6** | 1000 | **0.0** | **2.6** | 16 | **0.0** | **3.8** | 23 | **0.0** | **7.9** | 99 | **0.0** | **13.4** | 100 | **0.0** | **2.4** | 15 | **0.0** | **0.23** | 0.38 | **0.0** |
| Unit 2C | HC-VC-73-S1 | 0 | 1.9 | 2.68 | 12 | 0 | 17.3 | 160 | 0 | 27.0 | 1000 | 0 | 2.97 | 16 | 0 | 3.51 | 23 | 0 | 7.03 | 99 | 0 | 11.1 | 100 | 0 | 3.78 | 15 | 0 | 0.13 | 0.38 | 0 |
| Unit 2C | HC-VC-73-S2 | 1.9 | 4.6 | 0.91 | 12 | 0 | 13.6 | 160 | 0 | 11.1 | 1000 | 0 | 2.77 | 16 | 0 | 4.26 | 23 | 0 | 7.23 | 99 | 0 | 14.9 | 100 | 0 | 2.55 | 15 | 0 | 0.07 | 0.38 | 0 |
| Unit 2C | HC-VC-73-S3 | 5.1 | 7.4 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | 0 | — | — | — |
| Unit 2C | HC-VC-77-S1 | 0 | 2.1 | 4.38 | 12 | 0 | 31.3 | 160 | 0 | 35.4 | 1000 | 0 | 3.96 | 16 | 0 | 7.08 | 23 | 0 | 6.67 | 99 | 0 | 17.9 | 100 | 0 | 4.17 | 15 | 0 | 0.25 | 0.38 | 0 |
| Unit 2C | HC-VC-77-S2 | 2.1 | 3.9 | 0.20 | 12 | 0 | 1.78 | 160 | 0 | 2.0 | 1000 | 0 | 0.27 | 16 | 0 | 0.39 | 23 | 0 | 1.18 | 99 | 0 | 1.27 | 100 | 0 | 0.31 | 15 | 0 | 0.02 | 0.38 | 0 |
| Unit 2C | HC-VC-78-S1 | 0 | 2.4 | 1.13 | 12 | 0 | 8.21 | 160 | 0 | 10.0 | 1000 | 0 | 0.91 | 16 | 0 | 1.54 | 23 | 0 | 4.46 | 99 | 0 | 5.71 | 100 | 0 | 1.50 E | 15 | 0 | 0.18 | 0.38 | 0 |
| Unit 2C | HC-VC-78-S2 | 2.7 | 4 | 2.30 | 12 | 0 | 14.5 | 160 | 0 | 11.0 | 1000 | 0 | 2.7 | 16 | 0 | 4.00 | 23 | 0 | 5 | 99 | 0 | 17 | 100 | 0 | 2.45 E | 15 | 0 | 0.13 | 0.38 | 0 |
| Unit 2C | HC-VC-79-S1 | 0 | 2 | 0.91 | 12 | 0 | 10.4 | 160 | 0 | 8.1 | 1000 | 0 | 2.98 | 16 | 0 | 3.86 | 23 | 0 | 9.47 | 99 | 0 | 14.4 | 100 | 0 | 2.11 | 15 | 0 | 0.21 | 0.38 | 0 |
| Unit 2C | HC-VC-79-S2 | 2 | 3.8 | 1.27 | 12 | 0 | 16.2 | 160 | 0 | 14.4 | 1000 | 0 | 4.67 | 16 | 0 | 6.22 | 23 | 0 | 17.8 | 99 | 0 | 24.4 | 100 | 0 | 3.56 | 15 | 0 | 0.07 U | 0.38 | 0 |
| Unit 2C | HC-VC-80-S1 | 0 | 1.7 | 2.67 | 12 | 0 | 21.6 | 160 | 0 | 26.7 | 1000 | 0 | 4 | 16 | 0 | 5.56 | 23 | 0 | 24.4 | 99 | 0 | 19.8 | 100 | 0 | 6.00 | 15 | 0 | 0.24 | 0.38 | 0 |
| Unit 2C | HC-VC-80-S2 | 1.9 | 5.3 | 0.64 | 12 | 0 | 8.6 | 160 | 0 | 6.1 | 1000 | 0 | 3.07 | 16 | 0 | 5.2 | 23 | 0 | 6.71 | 99 | 0 | 22.1 | 100 | 0 | 0.43 U | 15 | 0 | 0.79 | 0.38 | 2.08 |
| HC-VC-96 | HC-VC-96-C1 | 0 | 3.62 | 1.29 U | 12 | 0.00 | 8.4 | 160 | 0.00 | 7.6 | 1000 | 0 | 2.24 | 16 | 0.00 | 2.41 | 23 | 0.00 | 3.4 | 99 | 0 | 8.10 | 100 | 0 | 1.64 | 15 | 0 | 0.40 | 0.38 | 1.04 |
| HC-VC-96 | HC-VC-96-C2 | 3.62 | 10.03 | 0.84 U | 12 | 0.00 | 3.1 | 160 | 0.00 | 3.3 | 1000 | 0 | 0.71 | 16 | 0.00 | 1.10 | 23 | 0.00 | 1.6 | 99 | 0 | 4.00 | 100 | 0 | 0.47 U | 15 | 0 | 0.25 | 0.38 | 0.00 |
| **Unit 3A** | | | | **1.7** | 12 | **0.0** | **16.0** | 160 | **0.0** | **15.6** | 1000 | **0.0** | **3.3** | 16 | **0.0** | **6.5** | 23 | **0.0** | **14.0** | 99 | **0.0** | **7.8** | 100 | **0.0** | **4.0** | 15 | **0.0** | **0.2** | 0.38 | **0.0** |
| Unit 3C | HC-DC-93-S1 | 0 | 2 | 1.73 U | 12 | — | 13.1 | 160 | 0 | 18.1 | 1000 | — | 1.19 | 16 | 0 | 8.08 | 23 | 0 | 8.08 | 99 | — | 11.54 | 100 | 0 | 3.50 | 15 | 0 | 0.09 U | 0.38 | 0 |
| Unit 3C | HC-VC-82-S1 | 0 | 2.3 | 2.39 | 12 | 0 | 19.4 | 160 | 0 | 20.9 | 1000 | 0 | 3.88 | 16 | 0 | 5.22 | 23 | 0 | 13.9 | 99 | 0 | 11.8 | 100 | 0 | 4.78 | 15 | 0 | 0.22 | 0.38 | 0 |
| Unit 3C | HC-VC-82-S2 | 2.3 | 5.2 | 1.09 | 12 | 0 | 15.5 | 160 | 0 | 7.9 | 1000 | 0 | 4.91 | 16 | 0 | 6.27 | 23 | 0 | 20.0 | 99 | 0 | 0.160 | 100 | 0 | 3.64 | 15 | 0 | 0.18 | 0.38 | 0 |
| Unit 3C | HC-VC-82-S3 | 5.3 | 6.8 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — — | |
| **Unit 3B** | | | | **1.9** | 12 | **0.0** | **24.5** | 160 | **0.0** | **30.0** | 1000 | **0.0** | **5.8** | 16 | **0.0** | **6.6** | 23 | **0.0** | **16.5** | 99 | **0.0** | **20.9** | 100 | **0.0** | **5.87** | 15 | **0.0** | **0.17** | 0.38 | **0.0** |
| Unit 3B | HC-VC-97-C1 | 0 | 4.15 | 1.26 U | 12 | 0.00 | 11.8 | 160 | 0.00 | 9.6 | 1000 | 0 | 1.93 | 16 | 0.00 | 2.46 | 23 | 0.00 | 4.9 | 99 | 0 | 8.07 | 100 | 0 | 1.75 | 15 | 0 | 0.23 | 0.38 | 0 |
| Unit 3B | HC-VC-97-C2 | 4.15 | 8.025 | 0.92 U | 12 | 0.00 | 13.0 | 160 | 0.00 | 10.0 | 1000 | 0 | 4.50 | 16 | 0.00 | 4.90 | 23 | 0.00 | 9.5 | 99 | 0 | 16.00 | 100 | 0 | 2.90 E | 15 | 0 | 0.06 | 0.38 | 0 |
| Unit 3B | HC-VC-81-S1 | 0 | 1.6 | 1.75 U | 12 | 0 | 35.0 | 160 | 0 | 55.0 | 1000 | 0 | 5.5 | 16 | 0 | 6.75 | 23 | 0 | 20.8 | 99 | 0 | 25.0 | 100 | 0 | 7.00 | 15 | 0 | 0.24 | 0.38 | 0 |
| Unit 3B | HC-VC-81-S2 | 1.6 | 3.2 | 3.82 | 12 | 0 | 38.2 | 160 | 0 | 45.5 | 1000 | 0 | 11.45 | 16 | 0 | 12.4 | 23 | 0 | 30.9 | 99 | 0 | 34.6 | 100 | 0 | 11.8 | 15 | 0 | 0.16 | 0.38 | 0 |
| **Log Pond** | | | | **1.4** | 12 | **0.0** | **22.1** | 160 | **0.0** | **19.7** | 1000 | **0.0** | **7.6** | 16 | **0.0** | **9.3** | 23 | **0.0** | **7.6** | 99 | **0.0** | **16.3** | 100 | **0.0** | **5.3** | 15 | **0.0** | **0.31** | 0.38 | **0.0** |
| Log Pond | HC-DC-90-S1 | 0 | 1.6 | 1.25 | 12 | 0 | 25.0 | 160 | 0 | 28.8 | 1000 | 0 | 2.25 | 16 | 0 | 3.25 | 23 | 0 | 5.75 | 99 | 0 | 8.38 | 100 | 0 | 3.25 | 15 | 0 | 1.04 | 0.38 | 2.74 |
| Log Pond | HC-DC-90-S2 | 1.6 | 3.8 | 0.76 | 12 | 0 | 31.7 | 160 | 0 | 15.8 | 1000 | 0 | 22.5 | 16 | 1.41 | 16.7 | 23 | 0 | 15.0 | 99 | 0 | 50.0 | 100 | 0 | 10.8 | 15 | 0 | 0.48 | 0.38 | 1.26 |
| Log Pond | HC-VC-74-S1 | 0 | 2.4 | 3.33 | 12 | 0 | 19.3 | 160 | 0 | 20.0 | 1000 | 0 | 3.2 | 16 | 0 | 2.4 | 23 | 0 | 2.73 | 99 | 0 | 8.00 | 100 | 0 | 1.73 | 15 | 0 | 0.3 | 0.38 | 0 |
| Log Pond | HC-VC-74-S2 | 2.4 | 4.1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Log Pond | HC-VC-74-S3 | 4.5 | 6.9 | 1.67 | 12 | 0 | 25.8 | 160 | 0 | 30.3 | 1000 | 0 | 11.21 | 16 | 0 | 13.9 | 23 | 0 | 21.2 | 99 | 0 | 24.2 | 100 | 0 | 10.2 | 15 | 0 | 0.08 | 0.38 | 0 |
| Log Pond | HC-VC-75-S1 | 0 | 3.3 | 1.00 | 12 | 0 | 20.2 | 160 | 0 | 15.2 | 1000 | 0 | 2.39 | 16 | 0 | 4.44 | 23 | 0 | 3.13 | 99 | 0 | 12.1 | 100 | 0 | 2.63 | 15 | 0 | 0.14 | 0.38 | 0 |
| Log Pond | HC-VC-76-S1 | 0 | 3.5 | 1.00 | 12 | 0 | 14.0 | 160 | 0 | 13.0 | 1000 | 0 | 0.8 | 16 | 0 | 3.5 | 23 | 0 | 1.90 | 99 | 0 | 1.10 | 100 | 0 | 1.4 | 15 | 0 | 0.06 | 0.38 | 0 |
| Log Pond | HC-VC-76-S2 | 3.5 | 7.9 | 0.61 | 12 | 0 | 19.0 | 160 | 0 | 14.7 | 1000 | 0 | 10.53 | 16 | 0 | 21.1 | 23 | 0 | 3.37 | 99 | 0 | 10.0 | 100 | 0 | 6.95 | 15 | 0 | 0.04 | 0.38 | 0 |
| **I&J Waterway** | | | | **1.32** | 12 | **0.0** | **4.87** | 160 | **0.0** | **2.35** | 1000 | **0.0** | **0.96** | 16 | **0.0** | **1.29** | 23 | **0.0** | **1.45** | 99 | **0.0** | **3.60** | 100 | **0.0** | **1.78** | 15 | **0.0** | **0.15** | 0.38 | **0.0** |
| HC-VC-83 | HC-VC-83-S1 | 0 | 2.6 | 0.71 J | 12 | 0.06 | 6.1 | 160 | 0.00 | | 1000 | 0 | 0.79 J | 16 | 0.00 | 1.50 | 23 | 0.00 | --- | 99 | 0 | 5.26 | 100 | 0 | 1.87 | 15 | 0 | 0.18 | 0.38 | 0.00 |
| HC-VC-83 | HC-VC-83-S3 | 2.6 | 5.3 | -- nt | 12 | -- | -- nt | 160 | -- | -- nt | 1000 | 0 | -- nt | 16 | 0.00 | -- nt | 23 | 0.00 | -- nt | 99 | 0 | -- nt | 100 | 0 | -- nt | 15 | 0 | -- nt | 0.38 | 0.00 |
| HC-VC-84 | HC-VC-84-S1 | 0 | 1.4 | 0.66 J | 12 | 0.05 | 5.5 J | 160 | 0.03 | | 1000 | 0 | 0.52 J | 16 | 0.03 | 1.03 J | 23 | 0.04 | --- | 99 | 0 | 4.14 J | 100 | 0.04 | 1.41 J | 15 | 0 | 0.16 | 0.38 | 0.00 |
| HC-VC-84 | HC-VC-84-S2 | 2 | 4.9 | 0.57 J | 12 | 0.00 | 5.6 J | 160 | 0.00 | | 1000 | 0 | 0.90 J | 16 | 0.00 | 2.00 J | 23 | 0.00 | --- | 99 | 0 | 4.57 J | 100 | 0 | 2.00 J | 15 | 0 | 0.26 | 0.38 | 0 |
| HC-VC-85 | HC-VC-85-S1 | 0 | 4.5 | 1.93 J | 12 | 0.00 | 13.1 J | 160 | 0.08 | | 1000 | 0 | 1.88 J | 16 | 0.00 | 2.86 J | 23 | 0.00 | --- | 99 | 0 | 8.10 J | 100 | 0 | 3.81 J | 15 | 0 | 0.17 | 0.38 | 0.00 |
| HC-VC-94 | HC-VC-94-C1 | 0 | 3.56 | 2.61 U | 12 | 0.00 | 2.9 | 160 | 0.00 | 3.1 | 1000 | 0 | 1.43 U | 16 | 0.00 | 0.57 J | 23 | 0.00 | 1.9 | 99 | 0 | 2.09 | 100 | 0 | 0.61 J | 15 | 0 | 0.18 | 0.38 | 0 |
| HC-VC-94 | HC-VC-94-C2 | 3.56 | 6.77 | 2.30 U | 12 | 0.00 | 1.5 | 160 | 0.00 | 1.6 | 1000 | 0 | 1.20 | 16 | 0.00 | 0.31 E | 23 | 0.00 | 1 | 99 | 0 | 1.10 E | 100 | 0 | 0.34 E | 15 | 0 | 0.18 | 0.38 | 0 |
| HC-VC-95 | HC-VC-95-C1 | 0 | 2.55 | 0.96 U | 12 | 0.00 | 2.5 | 160 | 0.00 | | 1000 | 0 | 0.38 J | 16 | 0.00 | 0.85 | 23 | 0.00 | --- | 99 | 0 | 1.68 | 100 | 0 | 1.66 | 15 | 0 | 0.04 | 0.38 | 0 |
| HC-VC-95 | HC-VC-95-C2 | 2.55 | 4.87 | 0.85 U | 12 | 0.07 | 1.9 | 160 | 0.00 | | 1000 | 0 | 0.54 | 16 | 0.03 | 1.21 | 23 | 0.00 | --- | 99 | 0 | 1.85 | 100 | 0 | 2.50 | 15 | 0 | 0.04 U | 0.38 | 0 |

**Notes:**

U = Compound not detected at the indicated reporting limit.

— Not tested in this sample.

*: Multiple PAH compounds exceeded the SQS in this sample, but all PAH compounds were below the SQS in a matching duplicate sample, indicating that the PAH contamination is extremely localized in this area.

**: Value is an outlier. Not included in average calculation.

Pre 1996 Data excluded from analysis

Averages for subsurface sediment based on estimated 0.4 to 4.0 ft interval, using adjusted depth intervals as indicated.

For compounds with a measured concentration below the SQS, the ER for that compound was assigned a value of zero.

Enrichment calculated only for compounds detected above SQS in at least 2 or more samples, or in samples at ER values of greater than 2X. ER values not calculated for pentachlorophenol, benzoic acid and di-n-octylphthalate based on these criteria.

Dioxins not included in enrichment ratio calculations, because SQS values are not available for these compounds. Dioxins were elevated within the ASB sludges.

# Table G-1. Enrichment Ratios for Contaminated Subsurface Sediments

| Unit | Sample ID | Depth Below Mudline (ft) Top | Bottom | Bis(2-ethylhexyl)phthalate (SQS = 47) Conc. (ppm TOC) | SQS | ER | Butyl Benzyl Phthalate (SQS = 4.9) Conc. (ppm TOC) | SQS | ER | 2,4-Dimethylphenol (SQS = 29) Conc. (ug/kg) | SQS | ER | Phenol (SQS = 420) Conc. (ug/kg) | SQS | ER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ASB Sludges** | | | | 83.3 | 47 | 1.8 | 50.8 | 4.9 | 10.4 | 102.4 | 29 | 3.5 | 865.7 | 420 | 2.1 |
| ASB Sludges | GPA-01-A | 0 | 6 | 69.7 | 47 | 1.48 | 0.1 U | 4.9 | 0.00 | 47 U | 29 | 1.62 | 910 | 420 | 2.2 |
| ASB Sludges | GPA-01-B1 | 6.5 | 11.5 | 10.6 | 47 | 0.00 | 0.1 U | 4.9 | 0.00 | 47 U | 29 | 1.62 | 560 | 420 | 1.3 |
| ASB Sludges | GPA-02-A | 0 | 2.1 | 3.2 | 47 | 0.00 | 0.1 U | 4.9 | 0.00 | 46 U | 29 | 1.59 | 1,900 | 420 | 4.5 |
| ASB Sludges | GPA-02-B1 | 2.1 | 4 | 6.4 | 47 | 0.00 | 0.9 U | 4.9 | 0.00 | 500 U | 29 | 17.24 | 1,200 | 420 | 2.9 |
| ASB Sludges | GPA-02-B2 | 4 | 8.5 | 0.3 U | 47 | 0.00 | 0.1 U | 4.9 | 0.00 | 48 U | 29 | 1.66 | 210 | 420 | 0.0 |
| ASB Sludges | GPA-03-A | 0 | 2.6 | 4.8 | 47 | 0.00 | 0.1 U | 4.9 | 0.00 | 47 U | 29 | 1.62 | 1,000 | 420 | 2.4 |
| ASB Sludges | GPA-03-B1 | 2.7 | 5 | 11.6 | 47 | 0.00 | 0.1 U | 4.9 | 0.00 | 47 U | 29 | 1.62 | 520 | 420 | 1.2 |
| ASB Sludges | GPA-04-A | 0 | 4 | 10.5 | 47 | 0.00 | 6.4 U | 4.9 | 1.30 | 47 U | 29 | 1.62 | 350 | 420 | 0.0 |
| ASB Sludges | GPA-04-B1 | 4.5 | 7 | 714.3 | 47 | 15.20 | 500.0 U | 4.9 | 102.04 | 150 U | 29 | 5.17 | 100 U | 420 | 0.0 |
| ASB Sludges | GPA-05-A | 0 | 6.5 | 2.1 | 47 | 0.00 | 0.1 U | 4.9 | 0.00 | 45 U | 29 | 1.55 | 1,300 | 420 | 3.1 |
| **ASB - Sludge Native Contact** | | | | 6.8 | 47 | 0.0 | 0.21 | 4.9 | 0.0 | 9.2 | 29 | 0.0 | 38.5 | 420 | 0.0 |
| ASB - Contact | GPA-01-B2 | 13 | 19 | 5.9 | 47 | 0.00 | 0.2 U | 4.9 | 0.00 | 9.2 U | 29 | 0.00 | 6.5 U | 420 | 0.0 |
| ASB - Contact | GPA-03-B2 | 5.5 | 9 | 5.9 M | 47 | 0.00 | 0.2 U | 4.9 | 0.00 | 9.2 U | 29 | 0.00 | 36 | 420 | 0.0 |
| ASB - Contact | GPA-05-B1 | 7.5 | 13 | 8.5 | 47 | 0.00 | 0.2 U | 4.9 | 0.00 | 9.3 U | 29 | 0.00 | 73 | 420 | 0.0 |
| **ASB - Native Sediments** | | | | 36.1 | 47 | 0.0 | 10.3 U | 4.9 | 0.0 | 9.3 U | 29 | 0.0 | 8.9 | 420 | 0.0 |
| ASB Native | GPA-01-C | 26 | 32 | 60.0 | 47 | **1.28** | 40.0 U | 4.9 | 0.00 | 9.2 U | 29 | 0.00 | 6.3 U | 420 | 0.0 |
| ASB Native | GPA-02-C | 9 | 14 | 40.0 | 47 | 0.00 | 3.5 U | 4.9 | 0.00 | 9.2 U | 29 | 0.00 | 6.3 U | 420 | 0.0 |
| ASB Native | GPA-03-C | 12 | 17.5 | 24.7 | 47 | 0.00 | 1.6 U | 4.9 | 0.00 | 9.4 U | 29 | 0.00 | 6.5 U | 420 | 0 |
| ASB Native | GPA-04-B2 | 8.5 | 13.5 | 16.0 | 47 | 0.00 | 0.5 U | 4.9 | 0.00 | 9.3 U | 29 | 0.00 | 6.4 U | 420 | 0 |
| ASB Native | GPA-04-C | 18.5 | 23.5 | 31.3 | 47 | 0.00 | 1.6 U | 4.9 | 0.00 | 9.3 U | 29 | 0.00 | 6.4 U | 420 | 0 |
| ASB Native | GPA-05-B2 | 14 | 17.5 | 62.5 | 47 | **1.33** | 23.8 U | 4.9 | 0.00 | 9.3 U | 29 | 0.00 | 6.4 U | 420 | 0 |
| ASB Native | GPA-05-C | 19 | 23 | 18.3 | 47 | 0.00 | 0.8 U | 4.9 | 0.00 | 9.4 U | 29 | 0.00 | 24 | 420 | 0 |
| **ASB - Berm Sands** | | | | 27.6 | 47 | 0.0 | 19.1 U | 4.9 | 0.0 | 19.1 U | 29 | 0.0 | 19.1 | 420 | 0.0 |
| ASB Berm | BERM-01-10-16 | 10 | 16 | 11.1 U | 47 | 0.0 | 19 U | 4.9 | 0.0 | 19 U | 29 | 0.0 | 19 U | 420 | 0.0 |
| ASB Berm | BERM-02-10-16 | 10 | 16 | 22.7 U | 47 | 0.0 | 20 U | 4.9 | 0.0 | 20 U | 29 | 0.0 | 20 U | 420 | 0.0 |
| ASB Berm | BERM-03-10-16 | 10 | 16 | 20.9 U | 47 | 0.0 | 19 U | 4.9 | 0.0 | 19 U | 29 | 0.0 | 19 U | 420 | 0.0 |
| ASB Berm | BERM-04-8-14 | 8 | 14 | 15.0 U | 47 | 0.0 | 19 U | 4.9 | 0.0 | 19 U | 29 | 0.0 | 19 U | 420 | 0.0 |
| ASB Berm | BERM-05-8-14 | 8 | 14 | 14.3 U | 47 | 0.0 | 19 U | 4.9 | 0.0 | 19 U | 29 | 0.0 | 19 U | 420 | 0.0 |
| ASB Berm | BERM-06-10-16 | 10 | 16 | 15.8 U | 47 | 0.0 | 19 U | 4.9 | 0.0 | 19 U | 29 | 0.0 | 19 U | 420 | 0.0 |
| ASB Berm | BERM-07-7-11 | 7 | 11 | 14.8 U | 47 | 0.0 | 19 U | 4.9 | 0.0 | 19 U | 29 | 0.0 | 19 U | 420 | 0.0 |
| ASB Berm | BERM-08-10-14 | 10 | 14 | 106.3 | 47 | 2.3 | 19 U | 4.9 | 0.0 | 19 U | 29 | 0.0 | 19 | 420 | 0.0 |
| **Whatcom Waterway Sediments Average (Excluding Log Pond & I&J Waterway)** | | | | 8.0 | 47 | 0.0 | 1.8 | 4.9 | 0.0 | 15.4 | 29 | 0.0 | 107.5 | 420 | 0 |
| **Unit 1A/B** | | | | 2.5 | 47 | 0.0 | 1.5 | 4.9 | 0.0 | 18.5 | 29 | 0.0 | 24.3 | 420 | 0.0 |
| Unit 1A/B | AN PC CMP1 | 0 | 4 | 1.76 | 47 | 0 | 0.80 U | 4.9 | 0 | 20 U | 29 | 0 | 20 U | 420 | 0 |
| Unit 1A/B | AN PC CMP2 | 0 | 4 | 1.39 | 47 | 0 | 0.87 U | 4.9 | 0 | 20 U | 29 | 0 | 20 U | 420 | 0 |
| Unit 1A/B | AN PC CMP3 | 0 | 4 | 2.80 | 47 | 0 | 0.95 U | 4.9 | 0 | 19 U | 29 | 0 | 19 U | 420 | 0 |
| Unit 1A/B | AN PC CMP4 | 0 | 4 | 1.95 | 47 | 0 | 0.95 U | 4.9 | 0 | 20 U | 29 | 0 | 24 | 420 | 0 |
| Unit 1A/B | HC-VC-70-S1 | 0 | 1.5 | 3.70 | 47 | 0 | 0.55 | 4.9 | 0 | 3.0 E | 29 | 0 | 34 U | 420 | 0 |
| Unit 1A/B | HC-VC-70-S2 | 3.7 | 5.8 | 3.58 | 47 | 0 | 4.83 U | 4.9 | 0 | 29.0 U | 29 | 0 | 29 U | 420 | 0 |
| Unit 1A/B | HC-VC-70-S3 | 1.5 | 3.7 | -- nt | 47 | 0 | -- nt | 4.9 | 0 | -- nt | 29 | 0 | -- nt | 420 | 0 |
| **Unit 1C** | | Average ER | | 5.2 | 47 | 0.0 | 2.2 | 4.9 | 0.0 | 15.7 | 29 | 0.0 | 43 | 420 | 0 |
| Unit 1C | HC-DC-86-S1 | 0 | 1.9 | 3.78 | 47 | 0 | 3.35 U | 4.9 | 0 | 38 U | 29 | 0 | 47 | 420 | 0 |
| Unit 1C | HC-DC-86-S2 | 1.9 | 3.8 | 3.04 | 47 | 0 | 0.61 E | 4.9 | 0 | 34 U | 29 | 0 | 26 | 420 | 0 |
| Unit 1C | HC-DC-87-S1* | 0 | 2.3 | 3.53 | 47 | 0 | 2.00 U | 4.9 | 0 | 8.6 | 29 | 0 | 42 | 420 | 0 |
| Unit 1C | HC-DC-87-S2 | 2.3 | 3.8 | 5.00 | 47 | 0 | 1.48 U | 4.9 | 0 | 10 | 29 | 0 | 55 | 420 | 0 |
| Unit 1C | HC-DC-88-S1 | 0 | 1.6 | 5.14 | 47 | 0 | 1.46 U | 4.9 | 0 | 3.6 | 29 | 0 | 47 | 420 | 0 |
| Unit 1C | HC-DC-88-S2 | 1.6 | 3.8 | 2.18 | 47 | 0 | 1.09 U | 4.9 | 0 | 13 | 29 | 0 | 59 | 420 | 0 |
| Unit 1C | HC-DC-89-S1 | 0 | 1.6 | 21.5 | 47 | 0 | 6.76 | 4.9 | 1.38 | 4.9 | 29 | 0 | 42 | 420 | 0 |
| Unit 1C | HC-DC-89-S2 | 1.6 | 3.8 | 2.87 | 47 | 0 | 0.74 U | 4.9 | 0 | 35 | 29 | 1.21 | 82 | 420 | 0 |
| Unit 1C | HC-VC-71-S1 | 0 | 1.6 | 1.59 | 47 | 0 | 2.63 U | 4.9 | 0 | 5.5 | 29 | 0 | 26 | 420 | 0 |
| Unit 1C | HC-VC-71-S2 | 1.6 | 4.8 | 2.27 | 47 | 0 | 2.15 U | 4.9 | 0 | 16 E | 29 | 0 | 28 U | 420 | 0 |
| Unit 1C | HC-VC-72-S1 | 0 | 3.2 | 6.45 | 47 | 0 | 2.16 | 4.9 | 0 | 4.1 | 29 | 0 | 15 | 420 | 0 |

## Table G-1. Enrichment Ratios for Contaminated Subsurface Sediments

| Unit | Sample ID | Depth Below Mudline (ft) | | Bis(2-ethylhexyl)phthalate (SQS = 47) | | | Butyl Benzyl Phthalate (SQS = 4.9) | | | 2,4-Dimethylphenol (SQS = 29) | | | Phenol (SQS = 420) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Top | Bottom | Conc. (ppm TOC) | SQS | ER | Conc. (ppm TOC) | SQS | ER | Conc. (ug/kg) | SQS | ER | Conc. (ug/kg) | SQS | ER |
| **Unit 2A/2B** | | | | **16** | 47 | **0.0** | **1.79** | 4.9 | **0.0** | **4.5** | 29 | **0.0** | **99** | 420 | **0.0** |
| Unit 2A/B | HC-DC-91-S1 | 0 | 1.6 | 39.3 | 47 | 0 | 3.93 | 4.9 | 0 | 4.0 | 29 | 0 | 78 | 420 | 0 |
| Unit 2A/B | HC-DC-91-S2 | 1.6 | 3 | 5.67 | 47 | 0 | 0.86 | 4.9 | 0 | 4.0 | 29 | 0 | 64 | 420 | 0 |
| Unit 2A/B | HC-DC-92-S1 | 0 | 1.4 | 10.7 | 47 | 0 | 1.47 U | 4.9 | 0 | 4.3 | 29 | 0 | 83 | 420 | 0.00 |
| Unit 2A/B | HC-DC-92-S2 | 1.4 | 2.8 | 10.0 | 47 | 0 | 0.89 | 4.9 | 0 | 5.6 | 29 | 0 | 170 | 420 | 0 |
| **Unit 2C** | | | | **6.09** | 47 | **0.0** | **1.6** | 4.9 | **0.0** | **17.3** | 29 | **0.0** | **141.8** | 420 | **0.0** |
| Unit 2C | HC-VC-73-S1 | 0 | 1.9 | 6.76 | 47 | 0 | 0.95 | 4.9 | 0 | 6.4 | 29 | 0 | 41 | 420 | 0 |
| Unit 2C | HC-VC-73-S2 | 1.9 | 4.6 | 4.04 | 47 | 0 | 1.38 | 4.9 | 0 | 19 | 29 | 0 | 33 | 420 | 0 |
| Unit 2C | HC-VC-73-S3 | 5.1 | 7.4 | — | — | — | — | — | — | — | — | — | — | — | — |
| Unit 2C | HC-VC-77-S1 | 0 | 2.1 | 5.42 | 47 | 0 | 1.73 | 4.9 | 0 | 10 | 29 | 0 | 41 | 420 | 0 |
| Unit 2C | HC-VC-77-S2 | 2.1 | 3.9 | 0.43 | 47 | 0 | 0.13 U | 4.9 | 0 | 17 | 29 | 0 | 31 | 420 | 0 |
| Unit 2C | HC-VC-78-S1 | 0 | 2.4 | 5.54 | 47 | 0 | 0.93 | 4.9 | 0 | 4.5 | 29 | 0 | 310 | 420 | 0 |
| Unit 2C | HC-VC-78-S2 | 2.7 | 4 | 5.50 | 47 | 0 | 2.3 | 4.9 | 0 | 3.9 | 29 | 0 | 54 | 420 | 0 |
| Unit 2C | HC-VC-79-S1 | 0 | 2 | 6.14 | 47 | 0 | 1.19 | 4.9 | 0 | 27 | 29 | 0 | 130 | 420 | 0 |
| Unit 2C | HC-VC-79-S2 | 2 | 3.8 | 3.56 | 47 | 0 | 1.27 | 4.9 | 0 | 27 | 29 | 0 | 62 | 420 | 0 |
| Unit 2C | HC-VC-80-S1 | 0 | 1.7 | 18.7 | 47 | 0 | 5.1 | 4.9 | 1.0 | 8.1 | 29 | 0 | 120 | 420 | 0 |
| Unit 2C | HC-VC-80-S2 | 1.9 | 5.3 | 6.5 | 47 | 0 | 1.5 | 4.9 | 0 | 31 E | 29 | 1.07 | 440 | 420 | 1.0 |
| HC-VC-96 | HC-VC-96-C1 | 0 | 3.62 | 7.93 B | 47 | 0 | 1.29 U | 4.9 | 0 | 8 J | 29 | 0.00 | 210 B | 420 | 0 |
| HC-VC-96 | HC-VC-96-C2 | 3.62 | 10.03 | 2.60 B | 47 | 0 | 0.84 U | 4.9 | 0 | 46 E | 29 | 1.59 | 230 B | 420 | 0 |
| **Unit 3A** | | | | **12.9** | 47 | **0.0** | **1.6** | 4.9 | **0.0** | **22.3** | 29 | **0.0** | **286.3** | 420 | **0.0** |
| Unit 3C | HC-DC-93-S1 | 0 | 2 | 13.1 | 47 | — | 0.92 E | 4.9 | 0 | 12 E | 29 | 0 | 49 | 420 | — |
| Unit 3C | HC-VC-82-S1 | 0 | 2.3 | 19.4 | 47 | 0 | 2.99 | 4.9 | 0 | 12 E | 29 | 0 | 130 | 420 | 0 |
| Unit 3C | HC-VC-82-S2 | 2.3 | 5.2 | 6.27 | 47 | 0 | 0.86 | 4.9 | 0 | 43 | 29 | 1.48 | 680 | 420 | 1.6 |
| Unit 3C | HC-VC-82-S3 | 5.3 | 6.8 | — | — | — | — | — | — | — | — | — | — | — | — |
| **Unit 3B** | | | | **19.4** | 47 | **0.0** | **2.73** | 4.9 | **0.0** | **14.1** | 29 | **0.0** | **209** | 420 | **0.0** |
| Unit 3B | HC-VC-97-C1 | 0 | 4.15 | 9.82 B | 47 | 0 | 0.67 U | 4.9 | 0 | 8.8 J | 29 | 0 | 190 B | 420 | 0 |
| Unit 3B | HC-VC-97-C2 | 4.15 | 8.025 | 1.70 EB | 47 | 0 | 0.92 U | 4.9 | 0 | 19 E | 29 | 0 | 280 B | 420 | 0 |
| Unit 3B | HC-VC-81-S1 | 0 | 1.6 | 42.5 | 47 | 0 | 4.25 | 4.9 | 0 | 7.4 | 29 | 0 | 35 | 420 | 0 |
| Unit 3B | HC-VC-81-S2 | 1.6 | 3.2 | 23.6 | 47 | 0 | 5.09 | 4.9 | 1.0 | 21 | 29 | 0 | 330 | 420 | 0 |
| **Log Pond** | | | | **4.3** | 47 | **0.0** | **0.6** | 4.9 | **0.0** | **13.6** | 29 | **0.0** | **97.9** | 420 | **0.0** |
| Log Pond | HC-DC-90-S1 | 0 | 1.6 | 3.63 | 47 | 0 | 0.59 | 4.9 | 0 | 14 | 29 | 0 | 41 | 420 | 0 |
| Log Pond | HC-DC-90-S2 | 1.6 | 3.8 | 4.25 | 47 | 0 | 0.73 U | 4.9 | 0 | 21 | 29 | 0 | 99 | 420 | 0 |
| Log Pond | HC-VC-74-S1 | 0 | 2.4 | 3.27 | 47 | 0 | 0.40 | 4.9 | 0 | 7.7 | 29 | 0 | 47 U | 420 | 0 |
| Log Pond | HC-VC-74-S2 | 2.4 | 4.1 | — | — | — | — | — | — | — | — | — | — | — | — |
| Log Pond | HC-VC-74-S3 | 4.5 | 6.9 | 11.8 | 47 | 0 | 1.17 | 4.9 | 0 | 36 E | 29 | 1.24 | 100 | 420 | 0 |
| Log Pond | HC-VC-75-S1 | 0 | 3.3 | 2.63 | 47 | 0 | 0.33 | 4.9 | 0 | 5.5 | 29 | 0 | 310 | 420 | 0 |
| Log Pond | HC-VC-76-S1 | 0 | 3.5 | 2.40 | 47 | 0 | 0.41 | 4.9 | 0 | 5.6 | 29 | 0 | 50 | 420 | 0 |
| Log Pond | HC-VC-76-S2 | 3.5 | 7.9 | 2.42 | 47 | 0 | 0.79 | 4.9 | 0 | 5.5 | 29 | 0 | 38 | 420 | 0 |
| **I&J Waterway** | | | | **9.43** | 47 | **0.0** | **1.39** | 4.9 | **0.0** | **60.8** | 29 | **2.1** | **131** | 420 | **0.0** |
| HC-VC-83 | HC-VC-83-S1 | 0 | 2.6 | 5.00 B | 47 | 0 | 1.76 U | 4.9 | 0 | 26 J | 29 | 0 | 300 B | 420 | 0 |
| HC-VC-83 | HC-VC-83-S3 | 2.6 | 5.3 | -- nt | 47 | 0 | -- nt | 4.9 | 0 | -- nt | 29 | 0 | -- nt | 420 | 0 |
| HC-VC-84 | HC-VC-84-S1 | 0 | 1.4 | 5.17 JB | 47 | 0 | 0.69 J | 4.9 | 0 | 16 J | 29 | 0 | 100 JB | 420 | 0 |
| HC-VC-84 | HC-VC-84-S2 | 2 | 4.9 | 4.71 JB | 47 | 0 | 0.34 J | 4.9 | 0 | 74 J | 29 | 0 | 86 JB | 420 | 0 |
| HC-VC-85 | HC-VC-85-S1 | 0 | 4.5 | 50.00 JB | 47 | 0 | 1.71 J | 4.9 | 0 | 38 J | 29 | 0.00 | 280 JB | 420 | 0 |
| HC-VC-94 | HC-VC-94-C1 | 0 | 3.56 | 1.65 EB | 47 | 0 | 2.61 U | 4.9 | 0 | 14 E | 29 | 0 | 34 B | 420 | 0 |
| HC-VC-94 | HC-VC-94-C2 | 3.56 | 6.77 | 1.60 EB | 47 | 0 | 2.20 U | 4.9 | 0 | 8.4 E | 29 | 0 | 23 B | 420 | 0 |
| HC-VC-95 | HC-VC-95-C1 | 0 | 2.55 | 6.79 B | 47 | 0 | 0.96 U | 4.9 | 0 | 190 | 29 | 0.00 | 160 B | 420 | 0 |
| HC-VC-95 | HC-VC-95-C2 | 2.55 | 4.87 | 0.48 JB | 47 | 0 | 0.83 U | 4.9 | 1.3796 | 120 | 29 | 0.00 | 63 B | 420 | 0 |

**Notes:**

U = Compound not detected at the indicated reporting limit.

— Not tested in this sample.

*: Multiple PAH compounds exceeded the SQS in this sample, but all PAH compounds were below the SQS in a matching duplicate sample, indicating that the PAH contamination is extremely localized in this area.

**: Value is an outlier. Not included in average calculation.

Pre 1996 Data excluded from analysis

Averages for subsurface sediment based on estimated 0.4 to 4.0 ft interval, using adjusted depth intervals as indicated.

For compounds with a measured concentration below the SQS, the ER for that compound was assigned a value of zero.

Enrichment calculated only for compounds detected above SQS in at least 2 or more samples, or in samples at ER values of greater than 2X. ER values not calculated for pentachlorophenol, benzoic acid and di-n-octylphthalate based on the

Dioxins not included in enrichment ratio calculations, because SQS values are not available for these compounds. Dioxins were elevated within the ASB sludges.

# Table G-2. Average Contaminant Concentrations and Enrichment Ratios for Shallow Subsurface Sediments (0.4-4.0 ft)

| Unit | Sample ID | Depth Below Mudline (ft) | | Shallow Subsurface Data (0.4-4 ft) (Yes/No) | Adjusted Depths and Weightings for Subsurface Sediment Averaging Calculations | | | | | Measured Concentrations for Sample Interval (Shallow Subsurface Sediment) | | | Contribution of Interval to Total 0.4 to 4.0 ft Sample Average Concentration | | | Average Concentration in Shallow Subsurface Sediments (0.4-4.0 ft) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Top* | *Bottom* | | *Top* | *Bottom* | *Interval Length* | *% of Sample* | *Adjustment Notes* | Hg Conc. (mg/kg) | 4-mp Conc. (ug/kg) | Cum. ER (X) | Hg Conc. (mg/kg) | Conc. (ug/kg) | Cum. ER (X) | Hg Conc. | 4-mp Conc. | Cum. ER |
| **ASB Sludges** | | | | | | | | | | | | | | | | | | |
| ASB Sludges | GPA-01-A | 0 | 6 | Yes | 0.4 | 4 | 3.6 | 100.0% | -- | 1.1 | 59,000 | 101.0 | 1.10 | 59,000 | 101.0 | **1.10** | **59,000** | **101.0** |
| ASB Sludges | GPA-01-B1 | 6.5 | 11.5 | No | -- | -- | -- | -- | -- | 7.0 | 42,000 | 87.9 | -- | -- | -- | | | |
| ASB Sludges | GPA-02-A | 0 | 2.1 | Yes | 0.4 | 2.1 | 1.7 | 47.2% | -- | 2.6 | 170,000 | 269.8 | 1.23 | 80,278 | 127.4 | **4.39** | **109,833** | **192.6** |
| ASB Sludges | GPA-02-B1 | 2.1 | 4 | Yes | 2.1 | 4 | 1.9 | 52.8% | -- | 6.0 | 56,000 | 123.4 | 3.17 | 29,556 | 65.1 | | | |
| ASB Sludges | GPA-02-B2 | 4 | 8.5 | No | 4 | -- | -- | -- | -- | 20.2 | 34 | 62.3 | -- | -- | -- | | | |
| ASB Sludges | GPA-03-A | 0 | 2.6 | Yes | 0.4 | 2.7 | 2.3 | 63.9% | Extended to 4 ft | 1.9 | 98,000 | 160.3 | 1.21 | 62,611 | 102.4 | **3.13** | **79,944** | **135.0** |
| ASB Sludges | GPA-03-B1 | 2.7 | 5 | Yes | 2.7 | 4 | 1.3 | 36.1% | -- | 5.3 | 48,000 | 90.2 | 1.91 | 17,333 | 32.6 | | | |
| ASB Sludges | GPA-04-A | 0 | 4 | Yes | 0.4 | 4 | 3.6 | 100.0% | -- | 7.7 | 26,000 | 63.5 | 7.70 | 26,000 | 63.5 | **7.70** | **26,000** | **63.5** |
| ASB Sludges | GPA-04-B1 | 4.5 | 7 | No | 4.5 | -- | -- | -- | -- | 5.1 | 7,700 | 150.1 | -- | -- | -- | | | |
| ASB Sludges | GPA-05-A | 0 | 6.5 | Yes | 0.4 | 4 | 3.6 | 100.0% | -- | 0.40 | 37,000 | 59.9 | 0.40 | 37,000 | 59.9 | **0.40** | **37,000** | **59.9** |
| **ASB - Sludge Native Contact** | | | | | | | | | | | | | | | | | | |
| ASB - Contact | GPA-01-B2 | 13 | 19 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ASB - Contact | GPA-03-B2 | 5.5 | 9 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ASB - Contact | GPA-05-B1 | 7.5 | 13 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **ASB - Native Sediments** | | | | | | | | | | | | | | | | | | |
| ASB Native | GPA-01-C | 26 | 32 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ASB Native | GPA-02-C | 9 | 14 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ASB Native | GPA-03-C | 12 | 17.5 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ASB Native | GPA-04-B2 | 8.5 | 13.5 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ASB Native | GPA-04-C | 18.5 | 23.5 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ASB Native | GPA-05-B2 | 14 | 17.5 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| ASB Native | GPA-05-C | 19 | 23 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **ASB - Berm Sands** | | | | | | | | | | | | | | | | | | |
| ASB Berm | BERM-01-10-16 | 10 | 16 | No | -- | -- | -- | -- | -- | | | | -- | -- | -- | -- | -- | -- |
| ASB Berm | BERM-02-10-16 | 10 | 16 | No | -- | -- | -- | -- | -- | | | | -- | -- | -- | -- | -- | -- |
| ASB Berm | BERM-03-10-16 | 10 | 16 | No | -- | -- | -- | -- | -- | | | | -- | -- | -- | -- | -- | -- |
| ASB Berm | BERM-04-8-14 | 8 | 14 | No | -- | -- | -- | -- | -- | | | | -- | -- | -- | -- | -- | -- |
| ASB Berm | BERM-05-8-14 | 8 | 14 | No | -- | -- | -- | -- | -- | | | | -- | -- | -- | -- | -- | -- |
| ASB Berm | BERM-06-10-16 | 10 | 16 | No | -- | -- | -- | -- | -- | | | | -- | -- | -- | -- | -- | -- |
| ASB Berm | BERM-07-7-11 | 7 | 11 | No | -- | -- | -- | -- | -- | | | | -- | -- | -- | -- | -- | -- |
| ASB Berm | BERM-08-10-14 | 10 | 14 | No | | | | | | | | | -- | -- | -- | -- | -- | -- |
| **Whatcom Waterway Sediments Average (Excluding Log Pond & I&J Waterway)** | | | | | | | | | | | | | | | | | | |
| **Unit 1A/B** | | | | | | | | | | | | | | | | | | |
| Unit 1A/B | AN PC CMP1 | 0 | 4 | Yes | 0.4 | 4 | 3.6 | 100.0% | | 1.0 | 50 | 2.5 | 1.01 | 50 | 2.5 | **1.01** | **50** | **2.5** |
| Unit 1A/B | AN PC CMP2 | 0 | 4 | Yes | 0.4 | 4 | 3.6 | 100.0% | | 0.9 | 31 | 2.2 | 0.90 | 31 | 2.2 | **0.90** | **31** | **2.2** |
| Unit 1A/B | AN PC CMP3 | 0 | 4 | Yes | 0.4 | 4 | 3.6 | 100.0% | | 1.1 | 43 | 2.7 | 1.10 | 43 | 2.7 | **1.10** | **43** | **2.7** |
| Unit 1A/B | AN PC CMP4 | 0 | 4 | Yes | 0.4 | 4 | 3.6 | 100.0% | | 1.3 | 52 | 3.0 | 1.25 | 52 | 3.0 | **1.25** | **52** | **3.0** |
| Unit 1A/B | HC-VC-70-S1 | 0 | 1.5 | Yes | 0.4 | 1.5 | 1.1 | 30.6% | | 2.3 | 170 | 5.6 | 0.70 | 52 | 1.7 | **0.82** | **52** | **2.00** |
| Unit 1A/B | HC-VC-70-S2 | 3.7 | 5.8 | Yes | 3.7 | 4 | 0.3 | 8.3% | | 0.18 | 5 | 0.4 | 0.02 | 0 | 0.0 | | | |
| Unit 1A/B | HC-VC-70-S3 | 1.5 | 3.7 | Yes | 1.5 | 3.7 | 2.2 | 61.1% | | 0.17 | -- | 0.4 | 0.10 | -- | 0.3 | | | |
| **Unit 1C** | | <u>Average ER</u> | | | | | | | | | | | | | | | | |
| Unit 1C | HC-DC-86-S1 | 0 | 1.9 | Yes | 0.4 | 1.9 | 1.5 | 41.7% | -- | 0.2 | 150 | 2.2 | 0.10 | 63 | 0.9 | **0.40** | **133** | **2.3** |
| Unit 1C | HC-DC-86-S2 | 1.9 | 3.8 | Yes | 1.9 | 4 | 2.1 | 58.3% | Extended to 4 ft | 0.5 | 120 | 2.3 | 0.30 | 70 | 1.3 | | | |
| Unit 1C | HC-DC-87-S1* | 0 | 2.3 | Yes | 0.4 | 2.3 | 1.9 | 52.8% | -- | 1.4 | 6 | 34.9 | 0.71 | 3 | 18.4 | **4.25** | **419** | **27.7** |
| Unit 1C | HC-DC-87-S2 | 2.3 | 3.8 | Yes | 2.3 | 4 | 1.7 | 47.2% | Extended to 4 ft | 7.5 | 880 | 19.6 | 3.54 | 416 | 9.3 | | | |
| Unit 1C | HC-DC-88-S1 | 0 | 1.6 | Yes | 0.4 | 1.6 | 1.2 | 33.3% | -- | 0.7 | 140 | 3.9 | 0.22 | 47 | 1.3 | **1.69** | **507** | **5.6** |
| Unit 1C | HC-DC-88-S2 | 1.6 | 3.8 | Yes | 1.6 | 4 | 2.4 | 66.7% | Extended to 4 ft | 2.2 | 690 | 6.4 | 1.47 | 460 | 4.3 | | | |
| Unit 1C | HC-DC-89-S1 | 0 | 1.6 | Yes | 0.4 | 1.6 | 1.2 | 33.3% | -- | 6.4 | 590 | 19.3 | 2.13 | 197 | 6.4 | **30.80** | **3,263** | **86.3** |
| Unit 1C | HC-DC-89-S2 | 1.6 | 3.8 | Yes | 1.6 | 4 | 2.4 | 66.7% | Extended to 4 ft | 43.0 | 4,600 | 119.8 | 28.67 | 3,067 | 79.8 | | | |
| Unit 1C | HC-VC-71-S1 | 0 | 1.6 | Yes | 0.4 | 1.6 | 1.2 | 33.3% | -- | 4.3 | 270 | 10.5 | 1.43 | 90 | 3.5 | **4.43** | **277** | **12.0** |
| Unit 1C | HC-VC-71-S2 | 1.6 | 4.8 | Yes | 1.6 | 4 | 2.4 | 66.7% | -- | 4.5 | 280 | 12.7 | 3.00 | 187 | 8.5 | | | |
| Unit 1C | HC-VC-72-S1 | 0 | 3.2 | Yes | 0.4 | 4 | 3.6 | 100.0% | Extended to 4 ft | 2.6 | 73 | 6.3 | 2.60 | 73 | 6.3 | **2.60** | **73** | **6.3** |

# Table G-2. Average Contaminant Concentrations and Enrichment Ratios for Shallow Subsurface Sediments (0.4-4.0 ft)

| Unit | Sample ID | Depth Below Mudline (ft) | | Shallow Subsurface Data (0.4-4 ft) (Yes/No) | Adjusted Depths and Weightings for Subsurface Sediment Averaging Calculations | | | | | Measured Concentrations for Sample Interval (Shallow Subsurface Sediment) | | | Contribution of Interval to Total 0.4 to 4.0 ft Sample Average Concentration | | | Average Concentration in Shallow Subsurface Sediments (0.4-4.0 ft) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Top | Bottom | | Top | Bottom | Interval Length | % of Sample | Adjustment Notes | Hg Conc. (mg/kg) | 4-mp Conc. (ug/kg) | Cum. ER (X) | Hg Conc. (mg/kg) | Conc. (ug/kg) | Cum. ER (X) | Hg Conc. | 4-mp Conc. | Cum. ER |
| **Unit 2A/2B** | | | | | | | | | | | | | | | | | | |
| Unit 2A/B | HC-DC-91-S1 | 0 | 1.6 | Yes | 0.4 | 1.6 | 1.2 | 33.3% | -- | 0.9 | 300 | 2.3 | 0.31 | 100 | 0.8 | **1.38** | **767** | **5.2** |
| Unit 2A/B | HC-DC-91-S2 | 1.6 | 3 | Yes | 1.6 | 4 | 2.4 | 66.7% | Extended to 4 ft | 1.6 | 1,000 | 6.6 | 1.07 | 667 | 4.4 | | | |
| Unit 2A/B | HC-DC-92-S1 | 0 | 1.4 | Yes | 0.4 | 1.4 | 1 | 27.8% | -- | 0.3 | 560 | 5.7 | 0.09 | 156 | 1.6 | **0.45** | **1,022** | **3.8** |
| Unit 2A/B | HC-DC-92-S2 | 1.4 | 2.8 | Yes | 1.4 | 4 | 2.6 | 72.2% | Extended to 4 ft | 0.5 | 1,200 | 3.0 | 0.36 | 867 | 2.2 | | | |
| **Unit 2C** | | | | | | | | | | | | | | | | | | |
| Unit 2C | HC-VC-73-S1 | 0 | 1.9 | Yes | 0.4 | 1.9 | 1.5 | 41.7% | -- | 2.0 | 480 | 4.9 | 0.83 | 200 | 2.0 | **3.11** | **1,075** | **8.9** |
| Unit 2C | HC-VC-73-S2 | 1.9 | 4.6 | Yes | 1.9 | 4 | 2.1 | 58.3% | -- | 3.9 | 1,500 | 11.7 | 2.27 | 875 | 6.9 | | | |
| Unit 2C | HC-VC-73-S3 | 5.1 | 7.4 | No | 5.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| Unit 2C | HC-VC-77-S1 | 0 | 2.1 | Yes | 0.4 | 2.1 | 1.7 | 47.2% | -- | 11.0 | 1,000 | 28.3 | 5.19 | 472 | 13.4 | **8.89** | **1,106** | **23.3** |
| Unit 2C | HC-VC-77-S2 | 2.1 | 3.9 | Yes | 2.1 | 4 | 1.9 | 52.8% | Extended to 4 ft | 7.0 | 1,200 | 18.9 | 3.69 | 633 | 10.0 | | | |
| Unit 2C | HC-VC-78-S1 | 0 | 2.4 | Yes | 0.4 | 2.7 | 2.3 | 63.9% | Extended to 2.7 ft | 2.1 | 610 | 5.1 | 1.34 | 390 | 3.3 | **1.49** | **682** | **4.1** |
| Unit 2C | HC-VC-78-S2 | 2.7 | 4 | Yes | 2.7 | 4 | 1.3 | 36.1% | -- | 0.4 | 810 | 2.2 | 0.15 | 293 | 0.8 | | | |
| Unit 2C | HC-VC-79-S1 | 0 | 2 | Yes | 0.4 | 2 | 1.6 | 44.4% | | 8.1 | 3,200 | 25.7 | 3.60 | 1,422 | 11.4 | **4.82** | **3,311** | **18.0** |
| Unit 2C | HC-VC-79-S2 | 2 | 3.8 | Yes | 2 | 4 | 2 | 55.6% | Extended to 4 ft | 2.2 | 3,400 | 11.8 | 1.22 | 1,889 | 6.6 | | | |
| Unit 2C | HC-VC-80-S1 | 0 | 1.7 | Yes | 0.4 | 1.9 | 1.5 | 41.7% | Extended to 1.9 ft | 1.0 | 3,200 | 8.3 | 0.42 | 1,333 | 3.4 | **7.42** | **13,583** | **41.9** |
| Unit 2C | HC-VC-80-S2 | 1.9 | 5.3 | Yes | 1.9 | 4 | 2.1 | 58.3% | -- | 12.0 | 21,000 | 65.9 | 7.00 | 12,250 | 38.4 | | | |
| HC-VC-96 | HC-VC-96-C1 | 0 | 3.62 | Yes | 0.4 | 3.62 | 3.22 | 89.4% | Average Depth | 2.7 | 4,600 | 14.5 | 2.42 | 4,114 | 13.0 | **2.87** | **5,381** | **16.3** |
| HC-VC-96 | HC-VC-96-C2 | 3.62 | 10.03 | Yes | 3.62 | 4 | 0.38 | 10.6% | | 4.3 | 12,000 | 31.2 | 0.45 | 1,267 | 3.3 | | | |
| **Unit 3A** | | | | | | | | | | | | | | | | | | |
| Unit 3C | HC-DC-93-S1 | 0 | 2 | Yes | 0.4 | 4 | 3.6 | 100.0% | Extended to 4 ft | 0.1 | 58 | 1.1 | 0.14 | 58 | 1.1 | **0.14** | **58** | **1.1** |
| Unit 3C | HC-VC-82-S1 | 0 | 2.3 | Yes | 0.4 | 2.3 | 1.9 | 52.8% | -- | 1.4 | 3,100 | 8.0 | 0.74 | 1,636 | 4.2 | **1.68** | **10,136** | **20.7** |
| Unit 3C | HC-VC-82-S2 | 2.3 | 5.2 | Yes | 2.3 | 4 | 1.7 | 47.2% | -- | 2.0 | 18,000 | 34.8 | 0.94 | 8,500 | 16.5 | | | |
| Unit 3C | HC-VC-82-S3 | 5.3 | 6.8 | No | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | | | |
| **Unit 3B** | | | | | | | | | | | | | | | | | | |
| Unit 3B | HC-VC-97-C1 | 0 | 4.15 | Yes | 0.4 | 4 | 3.6 | 100.0% | Average Depths | 1.8 | 3,900 | 10.2 | 1.80 | 3,900 | 10.2 | **1.80** | **3,900** | **10.2** |
| Unit 3B | HC-VC-97-C2 | 4.15 | 8.025 | No | -- | -- | -- | -- | | -- | -- | -- | -- | -- | -- | | | |
| Unit 3B | HC-VC-81-S1 | 0 | 1.6 | Yes | 0.4 | 1.6 | 1.2 | 33.3% | | 0.9 | 1,100 | 3.9 | 0.31 | 367 | 1.3 | **1.11** | **4,100** | **9.5** |
| Unit 3B | HC-VC-81-S2 | 1.6 | 3.2 | Yes | 1.6 | 4 | 2.4 | 66.7% | Extended to 4 ft | 1.2 | 5,600 | 12.3 | 0.80 | 3,733 | 8.2 | | | |
| **Log Pond** | | | | | | | | | | | | | | | | | | |
| Log Pond | HC-DC-90-S1 | 0 | 1.6 | Yes | 0.4 | 1.6 | 1.2 | 33.3% | | 3.8 | 1,200 | 13.8 | 1.27 | 400 | 4.6 | **9.27** | **2,333** | **28.8** |
| Log Pond | HC-DC-90-S2 | 1.6 | 3.8 | Yes | 1.6 | 4 | 2.4 | 66.7% | Extended to 4 ft | 12.0 | 2,900 | 36.3 | 8.00 | 1,933 | 24.2 | | | |
| Log Pond | HC-VC-74-S1 | 0 | 2.4 | Yes | 0.4 | 2.4 | 2 | 55.6% | | 10.5 | 360 | 25.6 | 5.83 | 200 | 14.2 | **38.42** | **200** | **93.7** |
| Log Pond | HC-VC-74-S2 | 2.4 | 4.1 | Yes | 2.4 | 4.1 | 1.7 | 47.2% | | 69.0 | — | 168.3 | 32.6 | -- | 79.5 | | | |
| Log Pond | HC-VC-74-S3 | 4.5 | 6.9 | No | -- | -- | -- | -- | | -- | -- | -- | -- | -- | -- | | | |
| Log Pond | HC-VC-75-S1 | 0 | 3.3 | Yes | 0.4 | 4 | 3.6 | 100.0% | Extended to 4 ft | 6.4 | 830 | 16.8 | 6.40 | 830 | 16.8 | **6.40** | **830** | **16.8** |
| Log Pond | HC-VC-76-S1 | 0 | 3.5 | Yes | 0.4 | 3.5 | 3.1 | 86.1% | | 1.3 | 440 | 3.2 | 1.12 | 379 | 2.7 | **1.25** | **587** | **3.4** |
| Log Pond | HC-VC-76-S2 | 3.5 | 7.9 | Yes | 3.5 | 4 | 0.5 | 13.9% | | 1.0 | 1,500 | 4.6 | 0.13 | 208 | 0.6 | | | |
| **I&J Waterway** | | | | | | | | | | | | | | | | | | |
| HC-VC-83 | HC-VC-83-S1 | 0 | 2.6 | Yes | 0.4 | 2.6 | 2.2 | 61.1% | | 1.4 | 160 | 3.5 | 0.86 | 98 | 2.1 | **2.10** | **98** | **5.2** |
| HC-VC-83 | HC-VC-83-S3 | 2.6 | 5.3 | Yes | 2.6 | 4 | 1.4 | 38.9% | | 3.2 | -- | 7.8 | 1.24 | -- | 3.0 | | | |
| HC-VC-84 | HC-VC-84-S1 | 0 | 1.4 | Yes | 0.4 | 2 | 1.6 | 44.4% | Extended to 2 ft | 0.7 | 100 | 2.0 | 0.29 | 44 | 0.9 | **1.51** | **317** | **3.9** |
| HC-VC-84 | HC-VC-84-S2 | 2 | 4.9 | Yes | 2 | 4 | 2 | 55.6% | | 2.2 | 490 | 5.4 | 1.22 | 272 | 3.0 | | | |
| HC-VC-85 | HC-VC-85-S1 | 0 | 4.5 | Yes | 0.4 | 4 | 3.6 | 100.0% | | 0.9 | 200 | 2.3 | 0.88 | 200 | 2.3 | **0.88** | **200** | **2.3** |
| HC-VC-94 | HC-VC-94-C1 | 0 | 3.56 | Yes | 0.4 | 3.56 | 3.16 | 87.8% | Average Depths | 1.3 | 130 | 3.2 | 1.14 | 114 | 2.8 | **1.36** | **124** | **3.3** |
| HC-VC-94 | HC-VC-94-C2 | 3.56 | 6.77 | Yes | 3.56 | 4 | 0.44 | 12.2% | | 1.8 | 78 | 4.4 | 0.22 | 10 | 0.5 | | | |
| HC-VC-95 | HC-VC-95-C1 | 0 | 2.55 | Yes | 0.4 | 2.55 | 2.15 | 59.7% | Average Depths | 0.7 | 460 | 1.7 | 0.41 | 275 | 1.0 | **0.47** | **379** | **1.7** |
| HC-VC-95 | HC-VC-95-C2 | 2.55 | 4.87 | Yes | 2.55 | 4 | 1.45 | 40.3% | | 0.2 | 260 | 1.9 | 0.06 | 105 | 0.7 | | | |

**Notes:**
U = Compound not detected at the indicated reporting limit.
— Not tested in this sample.
*: Multiple PAH compounds exceeded the SQS in this sample, but all PAH compounds were below the SQS in a matching duplicate sample, indicating that the PAH contamination is extremely localized in this area.
**: Value is an outlier. Not included in average calculation.
Pre 1996 Data excluded from analysis
Averages for subsurface sediment based on estimated 0.4 to 4.0 ft interval, using adjusted depth intervals as indicated.
For compounds with a measured concentration below the SQS, the ER for that compound was assigned a value of zero.
Enrichment calculated only for compounds detected above SQS in at least 2 or more samples, or in samples at ER values of greater than 2X. ER values not calculated for pentachlorophenol, benzoic acid and di-n-octylphthalate based on these criteria.
Dioxins not included in enrichment ratio calculations, because SQS values are not available for these compounds. Dioxins were elevated within the ASB sludges.

# Table G-3. Average Subsurface Mercury Concentrations in Natural Recovery Cores

| Location ID | Sample ID | Sample Interval (Actual) | | | | | Adjusted Intervals for Averaging Calculations | | | | Mercury Concentration Data for Interval and Average Subsurface Sediment | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth Interval (cm) | Start Depth (cm) | End Depth (cm) | Start Depth (ft) | End Depth (ft) | Start Depth (ft) | End Depth (ft) | Length (ft) | % of Sample | Mercury Concentration (mg/kg) | Contribution to Average Result (mg/kg) |
| HC-NR-100 | HC-NR-100-S01 | 0- 2.5 | 0 | 2.5 | 0.00 | 0.08 | -- | -- | -- | -- | 1.3 J | -- |
| HC-NR-100 | HC-NR-100-S02 | 2.5- 5 | 2.5 | 5 | 0.08 | 0.16 | -- | -- | -- | -- | 1 J | -- |
| HC-NR-100 | HC-NR-100-S03 | 5- 7.5 | 5 | 7.5 | 0.16 | 0.25 | -- | -- | -- | -- | 1.1 J | -- |
| HC-NR-100 | HC-NR-100-S04 | 7.5- 10 | 7.5 | 10 | 0.25 | 0.33 | -- | -- | -- | -- | 1.1 J | -- |
| HC-NR-100 | HC-NR-100-S05 | 10- 12.5 | 10 | 12.5 | 0.33 | 0.41 | 0.40 | 0.41 | 0.01 | 0.28% | 1.4 J | 0.004 |
| HC-NR-100 | HC-NR-100-S06 | 12.5- 15 | 12.5 | 15 | 0.41 | 0.49 | 0.41 | 0.49 | 0.08 | 2.28% | 1.3 J | 0.030 |
| HC-NR-100 | HC-NR-100-S07 | 15- 17.5 | 15 | 17.5 | 0.49 | 0.57 | 0.49 | 0.57 | 0.08 | 2.28% | 1.3 J | 0.030 |
| HC-NR-100 | HC-NR-100-S08 | 17.5- 20 | 17.5 | 20 | 0.57 | 0.66 | 0.57 | 0.66 | 0.08 | 2.28% | 1.3 J | 0.030 |
| HC-NR-100 | HC-NR-100-S09 | 20- 22.5 | 20 | 22.5 | 0.66 | 0.74 | 0.66 | 0.74 | 0.08 | 2.28% | 1.4 J | 0.032 |
| HC-NR-100 | HC-NR-100-S10 | 22.5- 25 | 22.5 | 25 | 0.74 | 0.82 | 0.74 | 0.98 | 0.24 | 6.72% | 1.3 J | 0.087 |
| HC-NR-100 | HC-NR-100-S13 | 30- 32.5 | 30 | 32.5 | 0.98 | 1.07 | 0.98 | 1.23 | 0.25 | 6.83% | 2.2 J | 0.150 |
| HC-NR-100 | HC-NR-100-S16/17 | 37.5- 42.5 | 37.5 | 42.5 | 1.23 | 1.39 | 1.23 | 1.48 | 0.25 | 6.94% | 7.2 J | 0.500 |
| HC-NR-100 | HC-NR-100-S19 | 45- 47.5 | 45 | 47.5 | 1.48 | 1.56 | 1.48 | 1.72 | 0.24 | 6.78% | 1.7 J | 0.115 |
| HC-NR-100 | HC-NR-100-S22 | 52.5- 55 | 52.5 | 55 | 1.72 | 1.80 | 1.72 | 1.97 | 0.25 | 6.89% | 1.4 J | 0.096 |
| HC-NR-100 | HC-NR-100-S25 | 60- 62.5 | 60 | 62.5 | 1.97 | 2.05 | 1.97 | 2.62 | 0.65 | 18.11% | 0.53 J | 0.096 |
| HC-NR-100 | HC-NR-100-S33 | 80- 82.5 | 80 | 82.5 | 2.62 | 2.71 | 2.62 | 3.20 | 0.58 | 16.00% | 0.27 J | 0.043 |
| HC-NR-100 | HC-NR-100-S40 | 97.5- 100 | 97.5 | 100 | 3.20 | 3.28 | 3.20 | 3.61 | 0.41 | 11.44% | 0.43 J | 0.049 |
| HC-NR-100 | HC-NR-100-S45 | 110- 112.5 | 110 | 112.5 | 3.61 | 3.69 | 3.61 | 4.00 | 0.39 | 10.89% | 0.21 J | 0.023 |
| | | | | | | | | | | | **Average Mercury Concentration (mg/kg)** | **1.29** |
| | | | | | | | | | | | **Average ER Value (X SQS)** | **3.13** |
| HC-NR-101 | HC-NR-101-S01 | 0- 2.6 | 0 | 2.6 | 0.00 | 0.09 | -- | -- | -- | -- | 1.7 | -- |
| HC-NR-101 | HC-NR-101-S02 | 2.6- 5.2 | 2.6 | 5.2 | 0.09 | 0.17 | -- | -- | -- | -- | 1.3 | -- |
| HC-NR-101 | HC-NR-101-S03 | 5.2- 7.8 | 5.2 | 7.8 | 0.17 | 0.26 | -- | -- | -- | -- | 1.4 | -- |
| HC-NR-101 | HC-NR-101-S04 | 7.8- 10.4 | 7.8 | 10.4 | 0.26 | 0.34 | -- | -- | -- | -- | 1.6 | -- |
| HC-NR-101 | HC-NR-101-S05 | 10.4- 13 | 10.4 | 13 | 0.34 | 0.43 | 0.40 | 0.43 | 0.03 | 0.83% | 1.7 | 0.014 |
| HC-NR-101 | HC-NR-101-S06 | 13- 15.6 | 13 | 15.6 | 0.43 | 0.51 | 0.43 | 0.51 | 0.09 | 2.37% | 1.7 | 0.040 |
| HC-NR-101 | HC-NR-101-S07 | 15.6- 18.2 | 15.6 | 18.2 | 0.51 | 0.60 | 0.51 | 0.60 | 0.09 | 2.37% | 1.7 | 0.040 |
| HC-NR-101 | HC-NR-101-S08 | 18.2- 20.8 | 18.2 | 20.8 | 0.60 | 0.68 | 0.60 | 0.68 | 0.09 | 2.37% | 1.6 | 0.038 |
| HC-NR-101 | HC-NR-101-S09 | 20.8- 23.4 | 20.8 | 23.4 | 0.68 | 0.77 | 0.68 | 0.77 | 0.09 | 2.37% | 2.1 | 0.050 |
| HC-NR-101 | HC-NR-101-S10 | 23.4- 26 | 23.4 | 26 | 0.77 | 0.85 | 0.77 | 1.02 | 0.25 | 7.01% | 2 | 0.140 |
| HC-NR-101 | HC-NR-101-S13 | 31.2- 33.8 | 31.2 | 33.8 | 1.02 | 1.11 | 1.02 | 1.28 | 0.26 | 7.13% | 1.8 | 0.128 |
| HC-NR-101 | HC-NR-101-S16/17 | 39- 44 | 39 | 44 | 1.28 | 1.44 | 1.28 | 1.54 | 0.26 | 7.24% | 3.1 | 0.225 |
| HC-NR-101 | HC-NR-101-S19 | 46.8- 49.4 | 46.8 | 49.4 | 1.54 | 1.62 | 1.54 | 1.79 | 0.25 | 7.08% | 5.1 | 0.361 |
| HC-NR-101 | HC-NR-101-S22 | 54.6- 57.2 | 54.6 | 57.2 | 1.79 | 1.88 | 1.79 | 2.05 | 0.26 | 7.20% | 3.1 | 0.223 |
| HC-NR-101 | HC-NR-101-S25 | 62.4- 65 | 62.4 | 65 | 2.05 | 2.13 | 2.05 | 2.47 | 0.42 | 11.76% | 4.6 | 0.541 |
| HC-NR-101 | HC-NR-101-S30 | 75.4- 78 | 75.4 | 78 | 2.47 | 2.56 | 2.47 | 2.73 | 0.26 | 7.14% | 1.7 | 0.121 |
| HC-NR-101 | HC-NR-101-S33 | 83.2- 85.8 | 83.2 | 85.8 | 2.73 | 2.81 | 2.73 | 3.16 | 0.43 | 11.97% | 1.7 | 0.204 |
| HC-NR-101 | HC-NR-101-S38 | 96.2- 98.8 | 96.2 | 98.8 | 3.16 | 3.24 | 3.16 | 3.33 | 0.17 | 4.85% | 0.59 | 0.029 |
| HC-NR-101 | HC-NR-101-S40 | 101.4- 104 | 101.4 | 104 | 3.33 | 3.41 | 3.33 | 3.75 | 0.42 | 11.78% | 0.3 | 0.035 |
| HC-NR-101 | HC-NR-101-S45 | 114.4- 117 | 114.4 | 117 | 3.75 | 3.84 | 3.75 | 4.00 | 0.25 | 6.88% | 0.22 | 0.015 |
| | | | | | | | | | | | **Average Mercury Concentration (mg/kg)** | **2.20** |
| | | | | | | | | | | | **Average ER Value (X SQS)** | **5.38** |

# Table G-3. Average Subsurface Mercury Concentrations in Natural Recovery Cores

| Location ID | Sample ID | Sample Interval (Actual) | | | | | Adjusted Intervals for Averaging Calculations | | | | Mercury Concentration Data for Interval and Average Subsurface Sediment | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth Interval (cm) | Start Depth (cm) | End Depth (cm) | Start Depth (ft) | End Depth (ft) | Start Depth (ft) | End Depth (ft) | Length (ft) | % of Sample | Mercury Concentration (mg/kg) | | Contribution to Average Result (mg/kg) |
| HC-NR-102 | HC-NR-102-S01 | 0- 2.4 | 0 | 2.4 | 0.00 | 0.08 | -- | -- | -- | -- | 0.34 | | -- |
| HC-NR-102 | HC-NR-102-S02 | 2.4- 4.8 | 2.4 | 4.8 | 0.08 | 0.16 | -- | -- | -- | -- | 0.42 | | -- |
| HC-NR-102 | HC-NR-102-S03 | 4.8- 7.2 | 4.8 | 7.2 | 0.16 | 0.24 | -- | -- | -- | -- | 0.37 | | -- |
| HC-NR-102 | HC-NR-102-S04 | 7.2- 9.6 | 7.2 | 9.6 | 0.24 | 0.31 | -- | -- | -- | -- | 0.68 | | -- |
| HC-NR-102 | HC-NR-102-S05 | 9.6- 12 | 9.6 | 12 | 0.31 | 0.39 | -- | -- | -- | -- | 0.49 | | -- |
| HC-NR-102 | HC-NR-102-S06 | 12- 14.4 | 12 | 14.4 | 0.39 | 0.47 | 0.40 | 0.47 | 0.07 | 2.01% | 0.5 | | 0.010 |
| HC-NR-102 | HC-NR-102-S07 | 14.4- 16.8 | 14.4 | 16.8 | 0.47 | 0.55 | 0.47 | 0.55 | 0.08 | 2.19% | 0.54 | | 0.012 |
| HC-NR-102 | HC-NR-102-S08 | 16.8- 19.2 | 16.8 | 19.2 | 0.55 | 0.63 | 0.55 | 0.63 | 0.08 | 2.19% | 0.56 | | 0.012 |
| HC-NR-102 | HC-NR-102-S09 | 19.2- 21.6 | 19.2 | 21.6 | 0.63 | 0.71 | 0.63 | 0.71 | 0.08 | 2.19% | 0.69 | | 0.015 |
| HC-NR-102 | HC-NR-102-S10 | 21.6- 24 | 21.6 | 24 | 0.71 | 0.79 | 0.71 | 0.94 | 0.23 | 6.43% | 0.56 | | 0.036 |
| HC-NR-102 | HC-NR-102-S13 | 28.8- 31.2 | 28.8 | 31.2 | 0.94 | 1.02 | 0.94 | 1.18 | 0.24 | 6.54% | 1.00 | | 0.065 |
| HC-NR-102 | HC-NR-102-S16/17 | 36- 40 | 36 | 40 | 1.18 | 1.31 | 1.18 | 1.42 | 0.24 | 6.64% | 0.83 | | 0.055 |
| HC-NR-102 | HC-NR-102-S19 | 43.2- 45.6 | 43.2 | 45.6 | 1.42 | 1.50 | 1.42 | 1.65 | 0.23 | 6.47% | 1.3 | | 0.084 |
| HC-NR-102 | HC-NR-102-S22 | 50.4- 52.8 | 50.4 | 52.8 | 1.65 | 1.73 | 1.65 | 1.89 | 0.24 | 6.58% | 4.5 | | 0.296 |
| HC-NR-102 | HC-NR-102-S25 | 57.6- 60 | 57.6 | 60 | 1.89 | 1.97 | 1.89 | 2.52 | 0.63 | 17.52% | 0.79 | | 0.138 |
| HC-NR-102 | HC-NR-102-S33 | 76.8- 79.2 | 76.8 | 79.2 | 2.52 | 2.60 | 2.52 | 3.07 | 0.55 | 15.30% | 0.19 | U | 0.029 |
| HC-NR-102 | HC-NR-102-S40 | 93.6- 96 | 93.6 | 96 | 3.07 | 3.15 | 3.07 | 3.46 | 0.39 | 10.83% | 0.19 | | 0.021 |
| HC-NR-102 | HC-NR-102-S45 | 105.6- 108 | 105.6 | 108 | 3.46 | 3.54 | 3.46 | 4.00 | 0.54 | 14.90% | 0.28 | | 0.042 |
| | | | | | | | | | | | **Average Mercury Concentration (mg/kg)** | | **0.82** |
| | | | | | | | | | | | **Average ER Value (X SQS)** | | **1.99** |

Notes:
U = Compound not detected at the indicated reporting limit.
-- Interval not used in averaging calculations.