RESPONSE to COMMENTS

Draft Remedial Investigation/Feasibility Study
Cornwall Ave Landfill cleanup site
Bellingham, Washington

Dec. 16, 2013

WASHINGTON STATE DEPARTMENT OF ECOLOGY

TOXICS CLEANUP PROGRAM

1. Introduction

On Aug. 22, 2013, a draft Remedial Investigation / Feasibility Study (RI/FS) for the Cornwall Ave Landfill cleanup site in Bellingham was issued for a 30-day public comment period. The public comment period closed on Sept. 20, 2013. Public involvement activities related to this public comment period included:

- Distribution of a fact sheet describing the site and requesting review of the draft RI/FS through mailing and emailing to approximately 1,700 people, including neighboring businesses and other interested parties;
- Publication of one paid display ad in *The Bellingham Herald*; dated Aug 22;
- Publication of a notice in the Washington State Site Register, dated Aug. 22, Sept. 5, and Sept. 19;
- Hosting an informational public meeting at the Bellingham Public Library on Aug. 28.
- Announcement of the public comment period and posting of the documents on the Department of Ecology (Ecology) website.
- 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 56 separate comments were submitted during the comment period.

Table 1: List of people who submitted comments.
Section 2: Background information on the site.
Section 3: Next steps for the cleanup site.
Section 4: Ecology's response to comments received.
Appendix A: Comments received.

Table 1. Summary of Commenters

1	Joel Douglas
2	Carole Edrehi
3	Terry Montonye
4	Lee First
5	Morgan Brunstrom
6	Arthur Mohr
7	Arthur Mohr
8	Lynne & Bob
9	Lynne & Bob
10	Judith Akins
11	Lee First
12	Jeremy Freimund
13	Wendy Stephenson

14	Wendy Stephenson
15	Hank Kastner
16	Trevor Robinson
17	Randel Perry
18	Allen Race
19	Wendy Stephenson
20	Judith Akins
21	Judith Akins
22	Brian Williams
23	Louann Chapman
24	John Riggs
25	Lynne Pendleton
26	Eleanor Hines
27	Tip Johnson
28	Libby Hazen
29	Katrina Novakova
30	Gaythia Weis
31	Janiene Licciardi
32	Virginia Prowell
33	Jonathan Schilk
34	Steve Tuckerman
35	Robert Earl
36	Eric Johnson
37	Joseph Knight
38	Wendy Harris
39	Wendy Harris
40	Wendy Harris
41	Wendy Harris
42	Wendy Harris
43	Wendy Harris
44	Laura Brakke
45	Helen Brandt
46	Margaret Knight
47	Bob Burr
48	Galen Herz
49	Mary Bell
50	Alex Chadsey
51	Timothy Goodman
52	Sandy Robson
53	Hal Glidden
54	Helen Glidden
55	Pam Borso
56	Wendy Steffensen

2. Background

The Cornwall Avenue Landfill cleanup site is located on the Bellingham waterfront at the south end of Cornwall Avenue between Boulevard Park and the former Georgia Pacific pulp mill. The site sits astride property owned by the city of Bellingham and state lands managed by the Department of Natural Resources, and is most recognizable today for the large mounds covered with white plastic. About 13 acres of the site are on land, and more than 3.5 acres are in water.

The history of property activities since the late 1880s was as follows:

- 1888-1946: The property was used for sawmill operations, including log storage and wood disposal.
- 1953-1965: The property was used as a municipal waste landfill.
- 1965: Upon closure of the landfill, the property was covered with a layer of soil.
- 1971 to 2005: The property was used for log storage and warehousing operations.
- 2011-2012: An interim action took place in which low-permeability soil was placed on the property and storm drainage improvements were made.

The Port of Bellingham, with Ecology oversight, has investigated contamination, evaluated cleanup options, and identified a preferred option for the Cornwall Avenue Landfill cleanup site on the Bellingham waterfront.

Extensive sampling across the site found potentially harmful levels of hazardous substances in the groundwater, soil and sediment. The contaminants are associated with historic municipal and wood waste disposal practices.

The site investigation found an estimated 295,000 cubic yards of municipal waste and 94,000 cubic yards of wood waste. Some of the contamination associated with this waste includes: tannins and lignins associated with wood waste breakdown products; elevated nitrogen compounds like ammonia; elevated dissolved metals like manganese; volatile organics like benzene; and various other organic compounds like PCBs, phenol, phthalates, and PAHs (polycyclic aromatic hydrocarbons).

To prevent people, plants and animals from being exposed to contaminants, four cleanup options were evaluated. Three of the options considered containing contaminants through various methods. The fourth option considered removing the contaminants.

A cost benefit analysis of the cleanup options identified a preferred option that includes: A cover consisting of topsoil, a drainage layer, a synthetic membrane, and a low-permeability soil layer; ; a shoreline stabilization system; a thin-layer sediment cap; a storm water drainage system, and monitored natural recovery for sediment.

3. Next Steps

The draft RI/FS will now be finalized and issued, and will include the following changes that resulted from public comment:

- The discussion of site history in Section 4.5 was modified to include historical use of the area by the Lummi Nation and other tribes.
- A discussion of seismic risk was added as Section 4.2.1.
- The text in Section 4.4 was modified to reflect changes in the Endangered Species Act.
- The discussion of risk to terrestrial species was clarified in Section 5.2 to indicate potential current exposure to harmful contamination.
- Bellingham's Critical Areas Ordinance was added to Section 9.2.2
- Use of the term "preliminary cleanup levels" was clarified in Sections 1.0 and 8.0.
- The "Consideration of Public Concerns" discussion in Section 9.7.1 and the disproportionate cost analysis in Section 9.7.3 were revised based on the apparent public preference for Alternative #3.

We will use the information in the final RI/FS to select a cleanup action for the site. A cleanup action plan for the site will be out for public review in early 2014. Design for the project, as well as permitting, will begin in 2014, too. Site-wide cleanup is expected to begin 2015.

4. Comments and Ecology Responses

Comment #1, Joel Douglas

You comment that the proposed cleanup constitutes more disastrous and dangerous waste removal, and we need to be realistic and leave well enough alone.

> The state Model Toxics Control Act (MTCA) was passed as a citizen initiative in 1989. Under the law, hazardous substances that pose a threat to human health and the environment must be addressed.

Comment #2, Carole Edrehi

Your letter mentions that the draft RI/FS overlooks historical violations of Indian treaties in the area, specifically Cherry Point, and asks that an August 2013 article in the Whatcom Watch by Jewell Praying Wolf James of the Lummi Indian Tribe, be included and acknowledged.

> The tribes assert various treaty rights, including the right to take fish. Ecology and the tribes have an overlapping interest in taking actions to protect fish, wildlife, and habitat. For the purpose of this RI/FS and cleanup of this site, Ecology is acting under the authority of MTCA to address the release of hazardous substances and ensure that human health and the environment are protected.

With regard to the Whatcom Watch article, Ecology does not believe it should be included as a reference in the RI/FS, because it was not used in the development of the RI/FS

You also ask that all "polluters" take "responsibility for damage caused," and that the cost of cleanup be paid by the companies who contributed to the site contamination, rather than taxpayers.

Ecology has found no record of any relationship between the companies referenced in your letter and contamination at the Cornwall Avenue Landfill site or neighboring cleanup sites. The landfill portion of the Site is the result of historic municipal waste disposal practices by the City of Bellingham under a lease with the Port of Bellingham, which in turn was operating under a lease from the Washington State Department of Natural Resources. As a result, all three of these entities have been identified as potentially liable for cleanup of the Site. The wood waste portion of the Site was likely created by the various now-defunct lumber mills that operated at the property.

Finally, with regard to future land use, you ask that Ecology honor Indian treaties without interference from the Bureau of Indian Affairs or non-native religious groups.

As noted above, Ecology and the tribes have an overlapping interest in taking actions to protect fish, wildlife, and habitat. For the purpose of this RI/FS and cleanup of this site, Ecology is acting under the authority of MTCA to address the release of hazardous substances and ensure that human health and the environment are protected. We have no authority with respect to land use, the Bureau of Indian Affairs, or non-native religious groups.

Comment #3, Terry Montonye

You suggest dredging part of the site to develop a high-stack "boatel," in addition to the proposed park.

Land use planning is beyond the scope of Ecology's cleanup authority under MTCA. We suggest that you direct this comment to the City of Bellingham as they move forward with their land use plans for the Waterfront District.

Comment #4, Lee First, North Sound Baykeeper Team

1. You request that the site be restored to provide healthy habitat supporting Lummi Nation's asserted treaty and fishing rights.

As noted below in our response to the Lummi Nation (Comment #12), the preferred cleanup alternative for the Cornwall site does seem to conform to the resolution stated in the Lummi's letter: "The policy of Lummi Nation is to ensure no further loss of the resource base or of environmental quality, and to restore and enhance damaged areas within the Lummi homeland and territories." The preferred alternative protects people

and plants and animals by eliminating exposure to harmful levels of contamination: Existing areas of degraded sediment will be restored; the quality of groundwater discharging from the landfill will improve; contaminated materials within the landfill will be isolated; and the shoreline will be stabilized to prevent landfill waste from being eroded into Bellingham Bay. Further habitat enhancement will also be considered during final design and permitting.

2. *Your comment indicates that Section 4.6 (Land and Navigation Use) does not address recreational uses by kayakers and other small water craft, and requests that their health and safety be adequately considered in the marine area cleanup.*

The property is currently fenced and warning signs have been posted at the access road and along the shoreline to prevent public access to the Site. Members of the public accessing the Site for recreational purposes are endangering themselves, and are illegally trespassing on city and state property.

3. Your comment references current landfill closure requirements under WAC 173-351, and requests that the "more protective" liner requirements outlined in this regulation be used at the site.

The WAC 173-351 standards call for a "composite liner," including a 30 mil thick geomembrane (or 60 mil if it is high density polyethylene -HDPE) over two feet of soil with a hydraulic conductivity no greater than 1×10^{-5} cm/sec. The purpose of the geomembrane coupled with low permeability soil is to minimize surface water infiltration.

As noted in your comment, the current solid waste handling requirements for landfill closure are not directly applicable to the Site because of the timing of the waste placement. The applicable regulation for closure of landfills that stopped accepting waste before 1991, including the Cornwall Avenue Landfill, is WAC 173-304 (Minimum Functional Standards for Solid Waste Handling). This regulation requires a cover consisting of <u>either</u> 2 feet of soil with a maximum hydraulic conductivity of 1×10^{-6} cm/sec, <u>or</u> a 50-mil synthetic geomembrane.

The preferred alternative for the Cornwall Avenue landfill includes both of these elements - a low permeability soil layer (the cement-amended dredged sediment) <u>and</u> a geomembrane layer. Taken together, these two layers exceed the hydraulic requirements of both WAC 173-304 and WAC 173-351. The hydraulic conductivity of the cement-amended sediment has been measured at 4×10^{-7} cm/sec, which is 50% lower than the WAC 173-304 standard, and twenty five times lower than the WAC 173-351 standard. The proposed 20 mil geomembrane adds an extra layer not required under the WAC 173-304 regulations.

It should also be noted that the preferred alternative includes a drainage layer, which is not required under either WAC 173-304 or WAC 173-351. This layer would also act to

minimize infiltration, and therefore contribute to the hydraulic separation function provided by the liner.

Having said all of this, the exact type of liner and thickness of the layers will be determined during future remedial design activities. An engineering design report describing the design details will be issued for public review.

You also mentioned that the dredged sediment to be used as a low-permeability cover is a "dioxin-containing...waste."

This material is natural bay sediment, containing 5% cement for strength and handling purposes. The sediment does contain typical urban contaminants, including dioxins/furans at concentrations between 10 and 20 parts per trillion (ppt). Dioxins/furans are ubiquitous in the environment as a product of natural processes (e.g. forest fires) and human activities (e.g. pulp and paper mills and wood treatment operations). Although an urban soil background value has not been established for the City of Bellingham, concentrations detected in the dredged sediment are close to or below urban soil background concentrations found in Seattle neighborhoods (25.8 ppt) .

4. The comment indicates that fly ash was mixed into the dredged sediment placed on the Cornwall Avenue landfill as part of the 2011-2012 interim action, and requests the more protective liner specified in WAC 173-351 because the dredged sediment is a "waste" stockpiled after the effective date of the -351 regulations.

Although a number of stabilizing agents were tested during design, including cement kiln dust and Class C fly ash, Portland cement was the stabilizing agent chosen and used for the interim action. Fly ash and cement kiln dust were not used. Regardless, the provisions of WAC 173-351, including specific liner requirements, are not triggered by the placement of the sediment on the site.

5. You state that the hydraulic conductivity of 4 x 10^{-7} cm/s for the stabilized dredge sediment determined during design of the interim action does not meet the hydraulic conductivity requirements of the current solid waste regulations, per WAC 173-351-300(3).

You appear to be referencing the section of WAC 173-351 that identifies the requirements for the liner system that underlies the waste for a new landfill, which requires a composite liner system consisting of a 60 mil geomembrane line and a 2 ft layer of soil with a hydraulic conductivity no greater than 1 x 10^{-7} cm/s. WAC 173-351-500(a)(i)(B) specifies the requirements for the final cover system for landfill closure under WAC 173-351, and specifies a 30 mil geomembrane layer (60 mil if HDPE is used) and a 2 ft layer of soil with a hydraulic conductivity no greater that 1 x 10^{-5} cm/s. The composite layer system in the preferred alternative equals or exceeds these requirements when the permeability characteristics of the stabilized marine sediment are taken into consideration. As noted in Ecology's response to Issue 3 above, WAC 173-304 are the regulations applicable to closure of the Cornwall Avenue Landfill, although

Ecology did consider WAC 173-351 when evaluating the anticipated performance of the preferred alternative.

6. You comment that sharp objects, wood or rocks in the stabilized sediment could puncture the overlying geomembrane. You also note that the sediment could be too wet or dry to be properly compacted, and could contain oversized clods that would damage the geomembrane layer.

Ecology acknowledges these concerns. The sediment was initially screened to remove large debris and then fed through a pug mill. The tolerances between moving parts in a pug mill are fairly tight, and required that all large objects be removed prior to processing of the marine sediment for stabilization. However, there may be smaller objects contained within the stabilized sediment, even possibly some sharp wooden debris. This issue will be addressed in the construction plans and specifications. Specifically, the specifications will require any sharp objects be removed from the surface of the stabilized sediment prior to placement of the synthetic geomembrane layer, and a quality control program will be instituted to confirm the removal.

With respect to moisture content, the stabilized sediment was processed to a specified range in moisture content determined to result in a compactable soil-like material during implementation of the interim action. Ecology anticipates that the stabilized material will maintain acceptable levels of water content until reuse as part of the cleanup action. However, adjustment of the moisture content (drying or wetting) during construction is commonly required for fine grained soils to achieve adequate compaction during placement, and can be achieved with standard construction practices. The construction plans and specifications will establish appropriate geotechnical requirements for sediment water content and compaction.

With respect to the potential formation of clods in the stabilized material, and the need to break up those clods, if present, during construction, this is not an unusual condition in fine grained soils. The breakup of clods can be accomplished by compacting the soil in thin layers (typically less than 1 foot thick) using a sheeps foot roller, or similar equipment. We anticipate that these methods would be effective in placing the stabilized sediment during construction, but additional testing of the stabilized material would be conducted during remedial design to confirm the physical properties of the material following recompaction and to determine the requirements for full scale placement and compaction.

7. This comment appears to request a pad be constructed to field test the hydraulic conductivity of stabilized sediment and its potential to damage the overlying geomembrane (from sharp objects, large clods) .

Ecology anticipates that additional laboratory/bench scale testing of the physical properties of the stabilized sediment will be conducted during remedial design, as is the standard of practice for large-scale grading projects, but we do not anticipate any need for a test pad. The issue of sharp objects or large clods would be handled as described above in our response to Issue 6.

8. This comment requests that additional samples be obtained from the stabilized marine sediment, apparently to provide a more representative data set for contaminants present in the sediment.

The conservative assumption is being made that all materials below the geomembrane (dredged sediment, original landfill cover soil, refuse, wood waste) are contaminated with organic and inorganic substances at concentrations above cleanup levels. All of these materials will therefore be isolated or removed as part of the cleanup. Further investigation into the nature and distribution of contaminants would serve no purpose under these circumstances.

9. You mention a concern regarding the physical properties of the 20 mil scrim reinforced polyethylene layer material relative to an HDPE layer.

As noted above, the combination of a drainage layer, the 20 mil geomembrane, and a low-permeability sediment layer exceeds the performance requirements specified in both WAC 173-304 and WAC 173-351 for minimizing infiltration. In addition, our initial evaluation has shown that polyethylene is chemically resistant and has an essentially unlimited life expectancy in the subsurface once installed. However, Ecology will require that the physical properties of the synthetic geomembrane layer be further evaluated during engineering design, and could require the use of a different liner material if warranted based on results of that evaluation. Ultimately, a geomembrane will be specified that is expected to fulfill its physical separation and hydraulic barrier functions in perpetuity.

10. You also note that 20 mil scrim reinforced polyethylene sheeting could be difficult to weld.

Ecology's expectation is that it would be seamed by both sewing and taping rather than welding. Ecology would require that performance standards be established for the integrity and water tightness of the seams, and that quality assurance testing be conducted during construction to demonstrate that the seams meet the performance requirements. As noted above, further evaluation of the liner will occur during engineering design, and a product will be specified that is expected to fulfill its physical separation and hydraulic barrier functions in perpetuity.

11. You indicate a preference for obtaining an extended warrantee for the geomembrane.

Extended warrantees are often appropriate for liner or capping systems installed above ground, where they are exposed to ultraviolet (UV) light. UV light greatly shortens the life of synthetic geomembrane material. Extended warrantees for synthetic geomembrane materials installed below ground are not practicable because of the long life of geosynthetic materials in the subsurface, and the high cost of an extended warranty. However, this issue will be revisited during final design.

12. You mention a concern regarding the ability to test and confirm weld strength for 20 mil scrim reinforced polyethylene, and request that thicker HDPE materials with established weld-strength testing methods be used instead of the proposed 20 mil geomembrane.

These issues will be further evaluated during final design, and will consider both initial and long-term strength and reliability. The evaluation will also consider the potential pull-apart effect of long-term refuse and wood waste settlement.

13. You state that most damage occurs to geomembrane layers during installation.

Ecology concurs, but will make plans to ensure that a 20 mil scrim reinforced polyethylene layer is installed without being damaged.

Comment #5, Morgan Brunstrom

Your letter correctly notes that the draft RI/FS does not discuss the full history of site use and does not address treaty violations.

We will expand the RI/FS to include a discussion of historical use of the site for traditional purposes prior to the 1880s. With regard to treaty violations, Ecology is not able to comment on the scope of asserted tribal treaty rights.

Your letter also indicates that the RI/FS report does not consider long term costs of the repair and maintenance of the proposed cap, and that capping would be the most expensive cleanup alternative when long term costs are considered.

The RI/FS does consider long term costs, and projects those costs for the first 20 years of operation and maintenance after the cleanup is constructed. The estimated costs for all alternatives are provided in Appendix F of the RI/FS report, including the costs for long term operations and maintenance. Once the capping system is constructed, only limited maintenance should be required for the preferred alternative, consisting primarily of periodic groundwater compliance monitoring and minor repairs to the shoreline stabilization system. Based on the approximately $70,000,000 difference in cost between the preferred alternative and Alternative 4 (complete removal), projecting the operations and maintenance costs further into the future would not change the conclusion that complete removal is not practicable in comparison to the preferred alternative or any of the other capping alternatives.

Lastly, you indicate the best choice is Alternative #4, complete removal.

Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis

WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable.

Comments #6 and #7, Arthur Mohr, GenPoint Associates

Your emails suggest the use of a specific type of synthetic liner for the site.

This suggestion will be considered during the engineering design phase of the project.

Comments #8 and #9, Lynne and Bob

Your emails suggest an alternative method for site cleanup, plasma gasification.

This technology appears to be quite promising, but very expensive and somewhat experimental. Industrial-sized plasma gasification plants have apparently been constructed in a few countries to treat large volume waste streams, such as the Mihama-Mikata facility in Japan that processes 28 tons of municipal refuse and sewage sludge per day. The process, however, does not appear to have been used for one-time or small-scale applications. Considering the expense involved and the uncertainty of designing a relatively untested small-scale plant, Ecology does not consider it appropriate to modify the FS to include this technology.

Comments #10, Judith Akins

Your comment is that dioxins are present in all media at the site and in the dredged sediment stockpiles, and that the sediment must be removed as part of cleanup, whatever the cost.

The dredged sediment does contain typical urban contaminants, including dioxins/furans at concentrations between 10 and 20 parts per trillion (ppt). Dioxins/furans are ubiquitous in the environment as a product of natural processes (e.g. forest fires) and human activities (e.g. pulp and paper mills and wood treatment operations). Although an urban soil background value has not been established for the City of Bellingham, concentrations detected in the dredged sediment are close to or below urban soil background concentrations found in Seattle neighborhoods (25.8 ppt) . Regardless, using this sediment as a low-permeability fill beneath a synthetic liner and two layers of earthen material (topsoil, drainage layer) will eliminate direct contact with the dredged sediment. It will also reduce water infiltration into the landfill thereby reducing the discharge of groundwater to the bay. Post construction monitoring will evaluate compliance with cleanup levels, and contingency measures will be taken as necessary. A compliance monitoring and contingency response plan will be included in the future engineering design report, which will be issued for public review.

With regard to the leaching of dioxins/furans into the bay via groundwater, these compounds adhere to soils and are largely insoluble in water. Moreover, the dredged sediment will not come in contact with either rainwater or groundwater.

Comment #11, Lee First

Your email asks what the "20ml scrim reinforced" liner is made out of.

> Brian Gouran of the Port of Bellingham had previously answered this question via email as follows: "Alternative 2 in the RI/FS identifies a 20mil scrim reinforced liner as a separation/protection layer. We anticipate that this would be a similar to the material that was used for the interim action and is currently covering the stockpiled dredge material. That material is a 20 mil scrim reinforced polyethylene. I attached a copy of the manufactures' information from the interim action construction documents. Note that although this is the material that was used in the interim action, additional engineering and design will be required to develop a performance specification for construction once we get to that phase of work for the site-wide cleanup."

Comment #12, Jeremy Freimund, Lummi Nation

Your letter correctly points out that the site history section of the RI/FS report (Section 2.1) and the project fact sheet do not mention the likely use of the site by Lummi Indians prior to the 1880s.

> There is a later section in the report (Section 4.5) that mentions the site may potentially have archaeological resources. The purpose of describing site history (in terms of industrial development) was to establish the basis for how the property came to be contaminated, and was not meant to overlook or minimize historical tribal use. We will revise the RI/FS to include a discussion of historical use of the site for traditional purposes.

Your letter also correctly notes that the disproportionate cost analysis (DCA) undertaken in the feasibility study portion of the RI/FS was based only on future remedial action costs. You requested the DCA be revised to include historical costs, specifically to "consider the costs to the environment, to Lummi Nation, environmental justice, cumulative effects, and other non-market goods and services over the past 125 years."

> This is an area where MTCA is clear, defining the costs used in the DCA as: "... construction, the net-present value of any long-term costs, and the agency oversight costs that are cost recoverable" WAC 173-340-360(3)(f)(iii). As a result, we cannot modify the DCA in the requested manner.

Lastly, you requested that we require the potential liable parties to implement Alternative 4 regardless of cost.

> Again, per MTCA, cleanup actions must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found

Alternative 2 to be permanent to the maximum extent practicable. As a result, we cannot compel the potentially liable parties to implement Alternative 4.

While we cannot comply with your requests within the constraints of the MTCA, the preferred cleanup alternative for the Cornwall site does seem to conform to the resolution stated in your letter: "The policy of Lummi Nation is to ensure no further loss of the resource base or of environmental quality, and to restore and enhance damaged areas within the Lummi homeland and territories." The preferred alternative protects people, plants, and animals by eliminating exposure to harmful levels of contamination: Existing areas of degraded sediment will be restored; the quality of groundwater discharging from the landfill will improve; contaminated materials within the landfill will be isolated; and the shoreline will be stabilized to prevent landfill waste from being eroded into Bellingham Bay. Further habitat enhancement will also be considered during final design and permitting.

Comment #13, Wendy Steffenson

You asked if there is a map showing Appendix E2 sediment coring stations.

Brian Gouran, Port of Bellingham previously responded via email as follows: "The locations associated with the information presented in Appendix E are shown on Figures 3-1, 6-6, and 6-7."

Comment #14, Wendy Steffenson

You had another question about the source of the hydraulic conductivity value for the dredged sediment.

Brian Gouran previously responded via email as follows: "Here is the Interim Action Plan which includes description of physical properties of the dredge material including hydraulic conductivity. Appendix A has the detailed information."

Comment #15, Hank Kastner

You indicate opposition to the preferred cleanup plan for Cornwall because the site can't be made safe for the public by covering it up.

Ecology acknowledges the preference for complete removal, however all the alternatives eliminate exposure to harmful levels of contamination. Each alternative guards against direct contact with people, guards against unsafe vapor emissions, prevents garbage from eroding into the bay, and protects surface water and sediment from contaminated groundwater. Moreover, Ecology must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-

360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable.

Comment #16, Trevor Robinson

Coordination with the RG Haley site: Your comment addresses the importance of coordinating the Cornwall and Haley site cleanups, and asks that Ecology develop a method to stop the "flow of contaminants" from Haley onto the Cornwall property before starting cleanup on Cornwall.

The flow you mentioned presumably refers to the dissolved diesel-range hydrocarbons in groundwater, most of it released more than 30 years ago. When plumes are this old, they are typically stable, neither advancing nor retreating. The groundwater data obtained to date indicates this is true of the Haley plume. Regardless,, the cleanup plan for the Haley site must eliminate any exposure pathways associated with the groundwater plume, and future monitoring will be necessary to confirm that groundwater standards are being met. With regard to timing, we expect the port and city to develop a schedule for the Cornwall and Haley cleanups that will coordinate the two for maximum efficiency.

You also noted that dealing with the perennial seep along the railroad tracks should be a top priority for controlling sources of contamination to the landfill.

Ecology does not consider the seepage a source of contamination, but simply an expression of near-surface groundwater flow down the face of the bluff. Ecology's primary concern with the seepage is that it may be adding to the flow of groundwater through the Site and into the bay.

Threats to organisms and habitats: You requested the terrestrial ecological evaluation be expanded to include current risks prior to cleanup.

Section 4.4.2.5 on Page 4-26 describes the presence of a variety of typical urban wildlife on the site and on the adjoining bluff/hillside. It is therefore a given that terrestrial plants and animals are currently being exposed to contaminants at concentrations likely to be harmful. We will clarify the discussion on Page 5-4 to indicate that current exposure is occurring and is the baseline condition.

You also asked that the city Critical Areas Ordinance be added to Section 9.2.2, Potentially Applicable State and Federal Laws.

We will do so.

Concerns with the landfill liners: Your comment addresses the longevity of the 20 mil scrim reinforced polyethylene material compared to the 60 mil HDPE material, and identifies expected life spans for these material based available information that you reviewed. You also request that the warrantied lifespan of the various synthetic geomembrane liner materials be discussed in the report.

The design life of the synthetic geomembrane layer is important to the long term performance of the capping system. Once installed and covered to prevent exposure to ultraviolet light, both polyethylene and HDPE should function for an indefinite period of time, even though the stated design life in manufacturer's literature identify a shorter design life. The 5-year lifespan that you mentioned for the 20 mil scrim reinforced polyethylene material is not the lifespan for this material in the subsurface, but is the manufacturer's estimated lifespan for this material as currently being used to cover the stockpiles of stabilized sediment at the Site. Regardless, the physical properties of the synthetic geomembrane layer will be further evaluated during design, and that evaluation could require the use of a different liner material.

Liner, landfill cap, and land use: You pose the following questions regarding land use as it relates to the integrity of the capping system:

1. Does a capped landfill impose limitations on building construction or park planning?

The integrity of all the containment remedies (Alternatives 1-3) must exist in perpetuity. Any building would therefore have to be constructed in a manner that maintains that integrity, and any modifications to the cap to accommodate a building would require the review and approval of Ecology. The park will also need to be designed, constructed, and maintained in a manner that does not compromise the integrity of the capping system. The park plan will be subject to review and approval by Ecology, and we intend to coordinate closely with the city in developing a cleanup design that accommodates, to the degree possible, the park plans developed by the city through their public review process.

2. Would trees require root barriers to prevent damage to the landfill liner?

It is anticipated that deep rooted plants would need to be placed in closed bottom planters or other structures that would prevent the growth of roots into the capping system.

3. Are there any dangers associated with landfill gases and indoor air pollution (sick building syndrome, etc)?

Ecology expects the potential for soil vapor intrusion and for impacts to ambient air to be limited given the age of the landfill. However, for planning purposes we have assumed that a gas collection system will be necessary over the upland portion of the site, and that any buildings or subsurface structures constructed on the site will require some type of passive system to protect from soil vapor intrusion. This issue will be further evaluated during final design.

4. Are there any dangers associated with liquefaction in the event of an earthquake?

Liquefaction typically occurs in uniform, loose, saturated sands. Landfill refuse is highly variable in material composition and particle size, and wood waste does not react like sand. As a result, the Site is not anticipated to be susceptible to liquefaction.

Preliminary cleanup levels: The comment is made that the term "preliminary cleanup levels" might be confusing to the public, and requests clarification of the term.

> This term is related to where we are in the MTCA cleanup process. For formal cleanup sites like the Cornwall landfill, final cleanup levels are set in the legal settlement (consent decree) between Ecology and the liable parties. Cleanup levels developed in precursor documents like the RI/FS are therefore, by definition, preliminary, or initial, or draft. To add to the complexity, most RI/FS documents have two tiers of non-final cleanup values, beginning with the introduction of "screening" levels, and closing with "preliminary" or "draft final" levels. The RI will be revised to clarify cleanup level terminology.

Dioxin screening level: A dioxin screening level is noted as being available for groundwater in Table 5-3, and a similar screening level is requested for soil.

> Table 5-3 is actually the soil table, and does provide a screening level for dioxins/furans (most stringent - 11 parts per trillion). Table 5-2 provides a corresponding groundwater screening level.

Comment #17, Randel Perry, Army Corps of Engineers, Seattle District

You note receiving a copy of the letter from the Lummi Nation, and that future permit requests for work at the site will require consultation with affected Tribes, like the Lummi.

> Ecology acknowledges the comment.

Comment #18, Allen Race

Your email suggests implementing Alternative #4, and using empty coal trains as the means to transport the excavated landfill off-site. This would apparently be followed by refilling a portion of the site, and using the filled area as an RV park.

> Using coal trains as a transport would not materially change the costs associated with excavation and disposal, and refilling the site would be an added cost. The outcome of the alternatives analysis in Section 9.7 of the RI/FS would therefore not change, and Alternative #4 would still be considered "impracticable" (see our responses to comments #5 and #12).

Comment #19, Wendy Steffensen

You requested an explanation as to how the physical criteria for wood waste in sediment were established.

> The 2008 criteria referenced in the draft RI/FS were based on an earlier 1997 guidance document prepared by the Army Corps of Engineers and Ecology for evaluating wood waste risk to the benthic community. This guidance document recommended wood waste

criteria be developed considering site specific conditions (wood distribution; TOC, ammonia, and sulfide concentrations; sediment grain size; depositional environment; local benthic health, etc.), and in accordance with the following general criteria:

1. Wood and wooden debris occupying more than 50% of a given volume of sediment is to be removed and disposed of on land.
2. Wood and wooden debris occupying between 50% and 25% of a given volume of sediment should be tested for toxicity (bioassay), and removed if it fails.
3. Wood and wooden debris occupying less than 25% of a given volume of sediment can be left in place.

These criteria were modified for the draft RI/FS by stipulating no more than one foot of sediment with more than 50% wood waste, or at least one foot of clean sediment over areas with more than one foot of sediment with more than 50% wood waste. The modified criteria are acceptable as preliminary cleanup criteria for purposes of the RI/FS, but Ecology plans to conduct additional testing (e.g., bioassays) during the design phase to confirm protectiveness.

Comment #20, Judith Akins

You indicated that the draft RI/FS downplays the effects of climate change, tsunamis, and earthquakes on the project, and stated it is difficult to believe the site will be safe for the long term.

Ecology is concerned about these environmental factors, and recognizes that they pose a risk to long term site safety. The draft RI/FS does address climate change and tsunamis in terms of potential impacts and estimated magnitudes, but does not include a description of earthquake risk. The final RI/FS will be modified to include a discussion of seismicity. Further risk evaluations will take place during the engineering design phase, wherein a detailed evaluation of effects, and of ways to compensate for those effects will take place. A key focus of the engineering will be to develop a design that protects the Site from these forces in perpetuity. A draft engineering design report will be issued for public review.

Comment #21, Judith Akins

Your email states a preference for Alternative 3, based on it meeting the requirement that the selected alternative be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b).

The DCA presented in Section 9.7 of the draft RI/FS does not support this assertion, and shows Alternative 2 as meeting this criterion. One factor to keep in mind is that all of the alternatives evaluated in the RI/FS are expected to meet cleanup requirements. Given this, cost becomes an important factor in determining which alternative meets the permanent to maximum extent practicable criterion.

You also ask that bioaccumulation effects be considered for compounds and metals like cadmium, lead, mercury, PCBs, PAHs, and dioxins/furans.

> The RI/FS does consider these effects in sediment. Table 5-1 includes a preliminary bioaccumulation cleanup level for PCBs (set at the detection limit), and notes that the PCB's are serving as a surrogate for other bioaccumulatives (cadmium, lead, and cPAHs) for purposes of the RI/FS. Page 8-5 of the text also mentions that all of the bioaccumulatives will need to be reconsidered during development of the CAP, and cleanup levels may be developed at that time. Although the timing remains uncertain, Ecology intends to determine background values for bioaccumulatives under the revised Sediment Management Standards rule, WAC 173-204. In the absence of tissue data, the revised rule allows for establishing cleanup levels for bioaccumulatives based on background or the laboratory practical quantitation level, whichever is higher. With regard to the other bioaccumulatives mercury and dioxin/furans, cleanup levels are not being set because these contaminants are associated with the adjoining Whatcom Waterway and RG Haley sites, respectively. However, the cleanup of contaminants associated with the Cornwall site will address other co-located contaminants.

A third comment is that the cleanup should provide healthy marine habitat and vegetative corridors, mitigation should be considered, and aspects of the cleanup related to habitat should be closely monitored.

> Ecology's primary authority and responsibility under MTCA is to implement cleanups that protect human health and the environment. We also strongly support improving habitat, and will work closely with the city's land use planning efforts to ensure that the cleanup design is compatible, to the degree possible, with land use decisions regarding improved habitat functions at the Site. Further refinement will occur during the permitting phase, when agencies and groups responsible for fish and wildlife management conduct their detailed reviews of the proposed cleanup. A detailed engineering design report for the cleanup, including habitat mitigation components, will be issued in draft form for public review.

Finally, you note that the Cornwall site cleanup must be coordinated with the Haley site cleanup, and request both cleanups be considered one project.

> Ecology intends to work closely with the city and port in coordinating cleanup design and construction for the two sites in order to maximize efficiency, minimize costs, and ensure environmental protection. However, unique solutions are required for each site because the nature and extent of contamination is different at each.

Comment #22, Brian Williams, Washington Department of Fish and Wildlife (DFW)

You request that final cleanup design minimize impacts to existing eelgrass habitat to the degree possible, and state that the DFW will provide comments on the plans during design and permitting.

Ecology supports the goal of not only minimizing impacts to eelgrass, but also enhancing habitat. We therefore appreciate DFW input on these issues.

Comment #23, Louann Chapman

Your letter states a preference for Alternative 3.

Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative #2 to be permanent to the maximum extent practicable. The final design of the various Alternative #2 elements (cap/liner, shoreline stabilization, gas control, sediment cap, etc.) will be developed on the basis of engineering criteria established in the engineering design report (e.g., design life, long-term strength, resistance to tearing, long-term permeability, etc.). The public will be given an opportunity to comment on the engineering design report.

Concern #1: You express concern about the potential harm to eelgrass beds from construction of the shoreline stabilization system.

Ecology shares you concern, and will work with the city and the permitting agencies to develop a plan that minimizes harm to the degree possible.

Concern #2: You indicate a thicker liner is better, but have doubts about the design life of even the 60-ml liner in Alternative #3.

The functional characteristics of the liner will be evaluated in detail during engineering design, with the intent to specify a product that functions as intended in perpetuity.

Concern #3: In this paragraph, there is a discussion of the benefits of a thicker sediment cap and an up-gradient groundwater diversion system (Alternative #3), an expression of concern that the topsoil will not be thick enough to support vegetation, and a request that vegetative corridors be installed.

With regard to topsoil and vegetative corridors, we intend to coordinate closely with the city in developing a cleanup design that accommodates, to the degree possible, land use

and habitat plans developed by the city through their public review process. With regard to Alternative #3, please see the first response to your comments.

Concern #4: A request is made to include a pocket beach at the south end of the site.

This is beyond what Ecology can require under our MTCA authority. However, we intend to coordinate closely with the city in developing a cleanup design that accommodates, to the degree possible, land use and habitat plans developed by the city through their public review process.

Comment #24, John Riggs

Your email states a preference for Alternative #3.

Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable.

Comment #25, Lynne Pendleton

Your email states a preference for Alternative #3, based on a "higher grade" of capping and on additional limiting of groundwater infiltration.

Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable. As noted previously, the operational characteristics of the cap will be considered further during engineering design, with the intent that it function as intended in perpetuity. Also, the effectiveness of the measures used to prevent water infiltration under Alternative 2 will be monitored closely to confirm that groundwater discharge into the bay meets cleanup levels.

You also mention the importance of coordinating site cleanup with the overall Bellingham Bay waterfront redevelopment.

> While land use planning is beyond the scope of Ecology's authority, we do intend to coordinate closely with the city in developing a cleanup design that accommodates, to the degree possible, land use plans developed by the city through their public review process.

Comment #26, Eleanor Hines, Surfrider Foundation

Your letter states that the Surfrider Foundation prefers Alternative #3.

> Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS)found Alternative 2 to be permanent to the maximum extent practicable.

One of your specific comments is that the Alternative #3 liner is thicker and the sediment cap more "robust" than the comparable elements in Alternative #2.

> Ecology acknowledges the difference between the liners, but both would be functional and protective in terms of meeting MTCA cleanup standards. These functional characteristics will be considered further during engineering design, with the intent to specify a liner that functions as intended in perpetuity.

With regard to the sediment cap, the comment is made that the Alternative #3 version is thicker than the Alternative #2 version, and therefore better.

> The actual thickness and extent of the sediment cap will be developed during the engineering design phase of the cleanup, when further oceanographic studies will be conducted and a more precise definition of site boundaries developed. Further refinement of the cap design will also occur during the permitting phase, when agencies and groups responsible for fish and wildlife management conduct their detailed reviews. Ultimately, Ecology's goal is to develop a sediment cap design that meets regulatory requirements and is protective of human health and the environment in perpetuity.

You also expressed concern about the effect of the landfill on benthic and aquatic species, and indicated support for the groundwater diversion barrier proposed under Alternative #3.

> Reducing water infiltration is extremely important, and a diversion barrier would prevent more water from entering the landfill than the measures included under Alternatives #1 or #2 alone. However, as noted above, the DCA found Alternative 2 to be permanent to the maximum extent practicable, and as a result, the preferred alternative under MTCA. The

diversion barrier is a relatively costly method for adding redundancy to the measures in Alternatives #1 and #2 that are already expected to result in the site meeting groundwater cleanup levels.

Additional concerns are expressed about the level of habitat protection in the cleanup alternative, and specifically about eelgrass beds and native vegetation corridors.

Ecology's primary authority and responsibility under MTCA is to implement cleanups that protect human health and the environment. We also strongly support improving habitat, and will work closely with the city's land use planning efforts to ensure that the cleanup design is compatible, to the degree possible, with land use decisions regarding improved habitat functions at the Site. Further refinement will occur during the permitting phase, when agencies and groups responsible for fish and wildlife management conduct their detailed reviews of the proposed cleanup. A draft engineering design report for the cleanup, including habitat mitigation components, will be issued for public review.

Lastly, your letter asks for a pocket beach at the south end of the site.

Land use planning is beyond the scope of Ecology's authority at the Site. However, we do intend to coordinate closely with the city in developing a cleanup design that accommodates, to the degree possible, land use plans developed by the city through their public review process.

Comment #27, Tip Johnson

Your first comment describes groundwater recharge from the upland "washing contaminants into the bay," and expresses doubts about how placing a cap on the top and water-side edge of the landfill would prevent this process from continuing.

The comment is correct in describing the significance of this contaminant transport mechanism, and it is for exactly this reason that all of the cleanup alternatives (except #4) involve cutting off a significant portion of the water entering into the landfill. The single largest component of recharge, and thus flow through the landfill, is from direct infiltration. A lesser component is lateral flow from the hillside. Each of the three containment alternatives removes essentially all of the direct infiltration and a portion of the lateral flow. This will significantly slow groundwater discharge to the bay, resulting in the discharge meeting water quality standards. Long term monitoring will be required to confirm that water quality standards are being met.

Another general comment appears to be that a containment alternative is not a solution because a more extensive cleanup would be needed later anyway.

Most of the larger landfills in Washington have been closed/cleaned up via containment, and it has not been necessary to do later, more extensive cleanups. Containment solutions tend to work in the short term because they eliminate exposure pathways and the

associated human health/environmental risks immediately. They also work for the long-term because they consist of elements that are generally passive and relatively easy to maintain: Low-permeability soils and buried synthetic liners don't degrade; gas venting systems remain simple conduits for air flow; and storm water drainage systems rely on gravity flow.

Comment #28, Libby Hazen

Your comment indicates a preference for Alternative 3.

As noted in the previous response (#27), Ecology acknowledges your preference, but must choose an alternative in accordance with the requirements of MTCA.

You also asked that the "dioxin cap" be removed completely.

The material being discussed is natural bay sediment, containing 5% cement for strength and handling purposes. The dredged sediment does contain typical urban contaminants, including dioxins/furans at concentrations between 10 and 20 parts per trillion (ppt). Dioxins/furans are ubiquitous in the environment as a product of natural processes (e.g. forest fires) and human activities (e.g. pulp and paper mills and wood treatment operations). Although an urban soil background value has not been established for the City of Bellingham, concentrations detected in the dredged sediment are close to or below urban soil background concentrations found in Seattle neighborhoods (25.8 ppt). Regardless, using this sediment as a low-permeability fill beneath a synthetic liner and two layers of earthen material (topsoil, drainage layer) will eliminate direct contact with the dredged sediment. It will also reduce water infiltration into the landfill thereby reducing the discharge of groundwater to the bay. Post construction monitoring will evaluate compliance with cleanup levels, and contingency measures will be taken as necessary. A compliance monitoring and contingency response plan will be included in the future engineering design report, which will be issued in draft form for public review.

Comment #29, Katrina Novak

Your first comment is that the dredged sediment currently stockpiled on the landfill should be moved to an inland disposal site, because it would be irresponsible to try to contain the contaminants beneath any of the proposed liners, all of which have life spans of less than 100 years.

Ecology agrees that any liner specified for this site needs to be capable of functioning in perpetuity. Design life will be considered further in the engineering phase of the project, and a liner will be specified that fulfills its physical separation and hydraulic barrier functions in perpetuity.

You also note that the Cornwall site cleanup should be addressed in tandem with the RG Haley site cleanup, and that a permanent, long term solution should be developed for the two.

Ecology intends to work closely with the city and port in coordinating cleanup design and construction between the two sites in order to maximize efficiency, minimize costs, and ensure environmental protection. However, separate solutions will be required for the two sites because the nature and extent of contamination is different at each.

Lastly, you request that the time frame for estimating the effects of sea level rise be extended much further than 100 years.

This issue will be considered further in the engineering design report as part of developing design criteria. Factors to be considered will include design-life engineering standards and the availability or accuracy of long-term sea level rise estimates. A draft engineering design report will be issued for public review.

Comment #30, Gaythia Weis

Introduction: You state a preference for Alternative #3, request shoreline habitat be included in the cleanup, and request that a commitment be made to more chemical and geophysical monitoring.

With regard to Alternative #3, Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable.

With regard to habitat improvement, Ecology's primary authority and responsibility under MTCA is to implement cleanups that protect human health and the environment. We also strongly support improving habitat, and will work closely with the city's land use planning efforts to ensure that the cleanup design is compatible, to the degree possible, with land use decisions regarding improved habitat functions at the Site. Further refinement will occur during the permitting phase, when agencies and groups responsible for fish and wildlife management conduct their detailed reviews of the proposed cleanup. A draft engineering design report for the cleanup, including habitat mitigation components, will be issued for public review.

With regard to monitoring, MTCA requires various kinds of monitoring programs during cleanup, and each of the alternatives evaluated in the FS specifies a monitoring component. Monitoring details have not yet been developed for the preferred alternative;

that work will be done as part of preparing the cleanup action plan, the engineering design report, and construction plans and specifications.

On total removal: You indicate the need for a better description of the kinds of "disruption and toxic contamination" that might occur under Alternative #4.

While the existing explanation may not be highly detailed, we believe it provides sufficient information to accomplish the purposes of an FS, which are to develop and evaluate cleanup alternatives in accordance with MTCA, and then select a preferred alternative.

You also suggest Ecology coordinate with the Lummi Nation and the public to create an itemized list of cleanup projects that they wish the Bellingham community to engage in.

Bellingham Bay has been the focus of a comprehensive cleanup effort since the late 1990's via the Bellingham Bay Demonstration Pilot - http://www.ecy.wa.gov/programs/tcp/sites_brochure/blhm_bay/blhm_bay.htm. Under this multi-organization bay-wide initiative, which includes the Lummi Nation, Ecology is currently working on 12 cleanup sites. The three sites you mention, Georgia-Pacific West, the old coal gasification plant (South State Street Manufactured Gas Plant), and RG Haley, are included in this body of work. MTCA legal agreements are in-place for each of these sites, and are therefore subject to the public involvement requirements of MTCA.

2.0 Site Description: The statement is made that the Cornwall landfill site cannot be considered separately from RG Haley site or outside the context of neighboring industrial operations (former Georgia Pacific Paper Mill, a former coal gasification plant, and a ship harbor).

This statement is correct in noting that the Cornwall site does not occur in isolation, but is part of a complex of former industrial properties riming Bellingham Bay. Ecology recognizes the interconnection of adjacent sites, but also that each site needs to be treated as unique, requiring different approaches to cleanup.

You state that there may be finger pointing back and forth over the property line and you provide site history information from an RG Haley document that supports the potential for this to happen,

Property within the RG Haley and Cornwall Avenue landfill sites is owned by the city of Bellingham and by Washington state, and they are liable for contamination at both sites. This common ownership and joint liability should minimize challenges for moving forward.

You also suggest that a blanket of organophillic clay and a plastic sheet that will be placed as an interim action at the adjacent RG Haley site could block the flow of groundwater, causing contaminants present on that site to spread onto the Cornwall landfill site.

This particular clay product has been treated to be permeable, but also capable of absorbing organic contaminants. The sheet (actually a separation layer) will not be plastic, but a geotextile that will allow water to pass through. There is therefore little risk of the interim action causing additional contamination of the Cornwall landfill site.

Remediation objectives: You list a series of objectives from the RI/FS document, and indicate that long term monitoring should also be included.

From a semantics standpoint, Ecology does not consider monitoring an objective, since the purpose of monitoring is to confirm whether or not project objectives have been or are continuing to be achieved. Having said this, Ecology considers post construction monitoring a key component of the cleanup action.

2.1 Site History: You correctly point out that the site history section does not mention ongoing or historical net fishing, or the likely use of the site by Lummi Indians.

There is a later section in the report (Section 4.5) that mentions the site may potentially have archaeological resources. The purpose of describing site history (in terms of industrial development) was to establish the basis for how the property came to be contaminated, and was not meant to overlook or minimize historical tribal use. The Lummis claimed historical use of this area, and requested that we add a discussion of historical use of the Site for traditional purposes to the RI/FS, which we will to do.

You also ask that the history of the site as described in the Cornwall RI/FS be checked for consistency with other reports pertaining to the area, and the history of the GP warehouse prior to 1971 further researched.

We are not clear what reports you are referring to, but we have reviewed several site specific documents and no additional information regarding the use of the GP warehouse prior to 1971 were noted. Regardless, Ecology considers the current information regarding historic use of the GP warehouse sufficient for the purposes of selecting a cleanup alternative.

2.2 Previous investigations: You correctly note that the seep sampling likely does not represent worst case conditions.

We are relying on the two rounds of groundwater sampling data obtained from wells at the shoreline in 2012 as a more accurate indicator of the current quality of water discharging to the bay.

2.3 Relationship to other documents and plans: You mention a concern that calling the area "Cornwall Beach" on city planning maps could set up unrealistic expectations as to what activities might be expected at the site in the future.

Ecology has no control over land use terminology used by the City of Bellingham.

4.1.1.2 General site drainage: You note that the text and illustrations in the RI/FS report do not mention topsoil type and thickness on the slope above the site.

RI's typically do not describe this aspect of the physical environment, because soil thickness is generally inconsequential relative to the thickness of underlying fill and/or geologic units, and has little bearing on contaminant movement. As a result, a discussion of this topic in the Cornwall RI/FS is unnecessary.

You also describe various stormwater collection and drainage features on the hillside above the site, and appear to conclude that collecting all of the runoff from this area, including extreme weather events, should be done and would be easy.

Ecology considered various ways to reduce recharge from the hillside area to groundwater beneath the site, including improvements to the hillside storm drainage system, and concluded that a cutoff trench installed at the property line would be most feasible. This element is included in Alternative #4.

4.1.4, Sediment deposition: You asked how the sediment deposition rates could be reconciled with a receding shoreline, and why wood materials are still visible under water. You also asked what happens during extreme storm events, and in a later section indicate that it is unreasonable to assume continuous net deposition when large scouring storms could occur.

Additional oceanographic studies and sediment surveys are needed to answer these questions fully, and to properly design the shoreline protection system and sediment cap. These studies will be completed during the engineering design phase of the project.

8.0 Discussion of cleanup standards: You make the point that landfill chemistry will change with time, and compounds other than ammonia and manganese may begin to exceed their respective cleanup levels. Based on this, you suggest broad spectrum chemical testing be conducted periodically to confirm the groundwater is still meeting cleanup levels.

Ecology plans on conducting periodic broad spectrum chemical testing as part of a long-term monitoring program. Our experience is that municipal landfill leachate tends to be relatively stable 10 to 20 years after closure, and that leachate quality slowly improves with time. Since the Cornwall landfill was closed almost 50 years ago, we consider it highly unlikely that new compounds will begin to exceed cleanup levels in the future.

You also mention that tall stacks may be necessary to vent landfill gas.

> Additional studies will be undertaken during final design to determine an appropriate venting system. To the degree possible, the system will be designed to be compatible with land use plans being developed by the city.

9.0 Feasibility study: You correctly note that the boundary of the Marine Site Unit has not been established, and imply that alternative selection should not occur until that boundary has been set.

> We carefully considered this issue and concluded that location of the boundary would have no impact on alternative selection. A boundary location more than the current estimated 300 feet from the shoreline would still be in the area slated for monitored natural recovery, meaning that remedial action costs and environmental benefits would remain about the same across all the alternatives.

Bioconcentration: These comments summarize your previous comments and add the suggestion that there be ongoing measurements assessing potential bioconcentration, and that sediment cleanup levels be set at concentrations more stringent than state standards.

> Regarding bioconcentration, Ecology intends to determine background values for bioaccumulatives under the revised Sediment Management Standards WAC 173-204. In the absence of tissue data to calculate risk-based cleanup levels, the revised rule allows establishment of cleanup levels for bioaccumulatives based on background or the laboratory practical quantitation level, whichever is higher. While the timing of ecology's background work is uncertain, cleanup levels will be developed for the Cornwall bioaccumulatives at some point. Given this approach to establishing sediment cleanup levels for bioaccumulatives, tissue monitoring is not necessary. If a risk-based approach were taken, appropriate tribal seafood consumption rates would be used.
>
> With regard to sediment cleanup standards, Ecology must follow state laws in setting these standards.

Future use: You make several suggestions for land use applications at the site, including an emphasis on habitat and public education.

> As noted previously, Ecology's primary authority and responsibility under MTCA is to implement cleanups that protect human health and the environment. We also strongly support improving habitat, and will work closely with the city's land use planning efforts to ensure that the cleanup design is compatible, to the degree possible, with land use decisions regarding improved habitat functions at the Site. Further refinement will occur during the permitting phase, when agencies and groups responsible for fish and wildlife management conduct their detailed reviews of the proposed cleanup. A draft engineering design report for the cleanup, including habitat mitigation components, will be issued for public review.

Comment #31, Janiene Licciardi

Your letter states a preference for Alternative #3.

> Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable. Final design of the various Alternative 2 elements (cap/liner, shoreline stabilization, gas control, sediment cap, etc.) will be developed later on the basis of engineering criteria established in the engineering design report.

You also asked that the dredged sediment currently stockpiled at the site be removed and transported to an inland storage facility.

> The material being discussed is natural bay sediment, containing 5% cement for strength and handling purposes. The dredged sediment does contain typical urban contaminants, including dioxins/furans at concentrations between 10 and 20 parts per trillion (ppt). Dioxins/furans are ubiquitous in the environment as a product of natural processes (e.g. forest fires) and human activities (e.g. pulp and paper mills and wood treatment operations). Although an urban soil background value has not been established for the City of Bellingham, concentrations detected in the dredged sediment are close to or below urban soil background concentrations found in Seattle neighborhoods (25.8 ppt). Regardless, using this sediment as a low-permeability fill beneath a synthetic liner and two layers of earthen material (topsoil, drainage layer) will eliminate direct contact with the dredged sediment. It will also reduce water infiltration into the landfill thereby reducing the discharge of groundwater to the bay. Post construction monitoring will evaluate compliance with cleanup levels, and contingency measures will be taken as necessary. A compliance monitoring and contingency response plan will be included in the future engineering design report, which will be issued in draft form for public review.

Next, you indicate that the time frame for estimating the effects of sea level rise should be extended much further than 100 years.

> This issue will be considered further in the engineering design report as part of developing design criteria. Factors to be considered will include the length of time needed to care for the landfill and the availability or accuracy of long-term sea level rise estimates.

Lastly, you ask that the RG Haley site be considered separately from the Cornwall landfill site.

Ecology is treating these separately, but is planning to work with the city and port to coordinate design and construction of the two projects. A draft RI/FS for the RG Haley site is expected to be available for public review in spring 2014.

Comment #32, Virginia Prowell

You've asked that we do the right thing and make the common sense, moral choices.

Ecology's cleanup work at the Cornwall landfill site is being conducted under the Model Toxics Control Act, and in accordance with our mission statement: "The mission of the Department of Ecology is to protect, preserve, and enhance Washington's environment, and to promote the wise management of our air, land, and water, for the benefit of current and future generations."

Comment #33, withdrawn

Comment #34, Jennie Tuckerman

Your email states a preference for Alternative #3, based on a more protective cap and groundwater diversion barrier that will decrease contaminant loading to the bay, and a thicker sediment cap that will improve waste isolation.

You correctly note that contaminant loading would be the less under Alternative #3 than under Alternative #2. However, the MTCA cleanup regulation does not use loading to determine whether groundwater at a site is protective of human health and the environment. Instead it uses chemical concentrations, or "cleanup levels," to make that determination. All of the alternatives evaluated in the RI/FS are expected to result in chemical concentrations below cleanup levels in groundwater at the point of discharge to Bellingham bay.

With regard to the thicker sediment cap, your comment is correct that it would increase waste isolation. Additional oceanographic studies and sediment surveys are needed to properly design the sediment cap so that it is fully protective of benthic life. These studies will be completed during the engineering design phase of the project.

Lastly you mention that "bioaccumulation calculations, standards and monitoring requirements" need to be established for protection of human health and the environment.

These issues are discussed in the draft RI/FS (Sections 8.1.3 and 10.1), and screening levels and preliminary cleanup levels protective of the bioaccumulation pathway are listed in Tables 5-1 and Table 8-2, respectively.

Comment #35, Robert Earl

You state a preference for Alternative #3, based on a more robust liner, a groundwater diversion barrier that will decrease contamination entering the bay, and a thicker sediment cap that will control underlying waste.

Ecology acknowledges the difference between the liners proposed for Alternatives #2 and #3, but both would be functional and protective in terms of meeting MTCA cleanup standards. These functional characteristics will be evaluated further during engineering design, with the intent to specify a liner that functions as intended in perpetuity.

The MTCA cleanup regulation uses chemical concentrations, or "cleanup levels," to determine whether groundwater entering the bay is sufficiently protective. All of the alternatives evaluated in the RI/FS are expected to result in chemical concentrations below cleanup levels in groundwater at the point of discharge to Bellingham bay.

With regard to the sediment cap, the actual thickness and extent of the sediment cap will be developed during the engineering design phase of the cleanup, when further oceanographic studies will be conducted and a more precise definition of site boundaries developed. Further refinement of the cap design will also occur during the permitting phase, when agencies and groups responsible for fish and wildlife management conduct their detailed reviews. Ultimately, Ecology's goal is to develop a final sediment cap design that meets regulatory requirements and is protective of human health and the environment in perpetuity.

Comment #36, Eric Johnson

Your comment requests implementation of the complete removal alternative.

Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable.

Comment #37, Joseph Knight

You indicate support for Alternative #3 based on better control of groundwater and surface water, a stronger liner, and a minimal difference in cost between Alternative #3 and Alternative #2.

Each of the alternatives is expected to perform, meaning the Site would meet cleanup standards if they were implemented. However, specific design elements of the cleanup

plan will be finalized during the engineering design phase of the project based on further studies (e.g., oceanographic modeling) and analyses. The final design elements may therefore vary from those specified in the alternatives analysis. Further refinement will also occur during the permitting phase, when agencies and groups responsible for aquatic life and wildlife management conduct their detailed reviews. Ultimately, Ecology's goal is to develop a final cleanup action design that meets regulatory requirements and is protective of human health and the environment in perpetuity.

Comment #38, Wendy Harris

Geological hazard: You indicate support for Alternative #4 because "hazardous waste should not be contained on land subjected to... abrupt stressors," and on land that is "geologically hazardous." You specifically mention seismic activity, liquefaction, lateral spreading, erosion, rising sea levels, and increased precipitation.

Ecology recognizes the significance of these environmental factors, and that the severity of impact for some is likely to increase in the future. The draft RI/FS addresses these factors on an initial basis, discussing potential impacts and estimated magnitudes (except seismicity, which will be added to the final RI/FS). They will be addressed again in much more detail in the engineering design report. That report will include a detailed evaluation of effects, and a description of methods to compensate for those effects. The key focus of the engineering effort will be to develop a design that protects the site in perpetuity. The engineering design report will be issued for public review.

Priority contaminants of concern: Your comment here is that containment is not an appropriate cleanup method when priority contaminants of ecological concern are involved because of their toxicity and persistence in the environment.

The goal of cleanup is to eliminate exposure of people, plants, and animals to harmful levels of contamination of any type or designation. All of the remedial alternatives evaluated in the RI/FS accomplish this, including those that call for containment.

You also suggest that the draft RI/FS does not consider risk to plants and animal life in terms of repairs that might be necessary after a "geologic event," and state that a MTCA cleanup is intended to protect plants and animals as well as people.

The goal of cleanup is to eliminate exposure of people, plants, and animals to harmful levels of contamination. All of the remedial alternatives evaluated in the RI/FS accomplish this, including those that call for containment. As stated above, geologic hazards will be fully evaluated as part of the engineering design process. Also, the engineering design report issued for public review will contain a compliance monitoring and contingency response plan. This plan will also address supplemental monitoring following extreme events.

<u>Terrestrial ecological evaluation</u>: You suggest a terrestrial ecological evaluation (TEE) be required under WAC 173-340-7490, because it would provide information that could effect the analysis of the alternatives.

> During the preparation of the draft RI, Ecology concluded that existing soil, refuse, and woodwaste at the site are potentially injurious to terrestrial wildlife, and that all of the alternatives would need to be protective of this group of receptors. Alternatives #1 through #3 accomplished this goal by providing a barrier (topsoil, drainage layer, liner) between wildlife and the contaminated materials. Alternative #4 accomplished the goal by removing the material to a different location. Further study of terrestrial wildlife was therefore unnecessary for purposes of the RI/FS.

You also mention that the Port has used a legal exemption to avoid a TEE, but Ecology could still require one be completed.

> The regulations governing the TEE process are set up as a series of off-ramps, and the process is considered complete if an off-ramp is reached. The legal exemption you mention is an off-ramp put in place to allow for situations where it is understood that all of the cleanup alternatives, except a complete removal option, will require institutional controls, and those controls will provide for the protection of terrestrial wildlife. These conditions apply to the Cornwall landfill site, so no additional TEE analysis is required.

<u>Summary</u>: This section suggests it would be important to check whether the substantive requirements of the Bellingham critical area ordinance are going to be met with regard to the placement of dredged sediment (containing dioxin) on geologically hazardous land.

> This issue was addressed as part of amending Agreed Order No. 1778. Section 3.5.B of the first amendment indicates Ecology had determined that the plans for the interim action (placing dredged sediment on the site) met the substantive requirements of Bellingham Municipal Code 16.55 – Critical Areas, including geologic hazards. Further consideration of the substantive requirements associated with this ordinance and other applicable laws and regulations will take place during design and permitting of the selected cleanup action for the Site.

<u>Comment #39, Wendy Harris</u>

<u>Dioxin; No beneficial reuse policy for dioxin</u>: The statement is made that the preferred alternative uses a technology that is not "officially accepted by the state and federal government as safe and permanent," and that Ecology has no policy for "beneficial reuse of dioxin."

> The issue seems to be concern about using dioxin-contaminated sediment as the lowest layer in a four-layer cover that serves to minimize surface water infiltration and isolate contaminated materials from surface contact. These two functions, minimizing infiltration and preventing contact, are standard attributes of a containment system (i.e. technology), and containment systems have been officially accepted by state and federal government at numerous municipal landfill cleanups/closures and other MTCA sites.

Ecology views the dredged sediment layer as being part of the hydraulic containment system, but not part of the preventing contact system. The latter consists of three layers – topsoil, a drainage layer, and a synthetic geomembrane, all of which overlie the dredged sediment and separate it from surface contact. This isolation design makes the preferred alternative safe and permanent.

As far as the beneficial reuse statements are concerned, it is the sediment that is being beneficially reused for its low permeability properties, not dioxin. Dioxin is a contaminant within the sediment present at parts per trillion levels, along with other contaminants typical of an urban setting.

Dioxin solidification/stabilization (S/S) inadequate as permanent technique:

The comment appears to confuse the purpose of the stabilization performed on the sediment stockpiled at the Site with treatment stabilization presented in EPA literature. The EPA literature you refer to is related to physical and chemical stabilization to essentially immobilize dioxin in soil. The marine sediment from the Gate 3 project was not treated with cement to prevent leaching, but for moisture control, that is, to turn wet, fine-grained sediment into a soil-like material that could be graded and compacted. The preferred remedy relies on containment to control dioxin mobility, including the inherent low permeability characteristic of the sediment, not chemical fixation or physical stabilization, as your comment suggests.

Health impacts worse than considered: This section includes a number of related comments suggesting that dioxin standards should be more stringent than currently promulgated under state law, that "background" should not be used as the lower limit of cleanup, and that the sediment should be removed from the site, because the site previously contained no dioxins.

As to the dioxin standards, Ecology recognizes that research is constantly changing our understanding of chemical toxicity. However, we are required to use current standards as established in the MTCA regulations to determine whether a particular contaminant does or does not exceed cleanup levels, and whether it does or does not need to be cleaned up. We have already acknowledged that the dioxin/furan concentrations in the dredged sediment exceed direct contact cleanup standards for upland soils. That conclusion would not change if a lower standard were adopted.

With regard to dioxin background, the issue is not relevant for this Site because all of the alternatives either isolate (contain) or completely remove all of the material containing dioxin.

With regard to the lack of prior dioxin contamination, Ecology believes it highly likely that dioxin concentrations in the underlying refuse, wood waste, and cover soil are equal to or greater than those in the dredged sediment. Not only were dioxin-producing industries in the immediate vicinity, but the municipal refuse likely reflects the same kinds of urban activities that produced the dioxin-contaminated sediment. Essentially, Ecology considers this site as being contaminated with dioxins irrespective of the

dredged sediment, and that almost any type of contamination could be present as a natural characteristic of a municipal refuse dump.

Misleading statements regarding dioxin: You state that Ecology failed to inform the public that the dredged sediment contained dioxins, and is continuing to mislead the public by providing a false sense of security. You also mention hearing the term "little bit" with respect to the amount of dioxin in the sediment, and that this is misleading.

Ecology did inform the public about the dioxin in the dredged sediment prior to implementing the interim action. The draft interim action work plan available for public review and comment, as part of amending agreed order No. 1778, specifically mentions the presence of dioxins (Page 2-4), and presents a tabulation of dioxin sampling results (Table 1). The public process associated with the agreed order amendment and interim action included the distribution of a fact sheet to over 6,000 individuals, publication of an advertisement in the Bellingham Herald, publication of a notice in the Washington State Site Register, and an evening public meeting.

As far as providing a false sense of security, we recognize dioxins/furans are a highly toxic group of compounds, and will require cleanup that eliminates exposure for people, plants, and animals.

With regard to a "little bit," Ecology does not recall using this term. What we have tried to do is provide a context for dioxin occurrence so that the public can more accurately gauge the degree of dioxin contamination in sediment relative to everyday exposure levels.

Comment #40, Wendy Harris

Externalization of costs: You ask whether the cost of the Gate 3 sediment import was included in the FS cost/benefit analysis, and that if not, it should be to provide a fair basis for comparison of the containment and removal alternatives. You also request at least one alternative be evaluated that includes "clean capping material."

The cost of importing the Gate 3 sediments was not included in any of the containment alternatives (Alternatives 1-3), nor was the cost of removing and disposing of the material included in the full removal alternative (Alternative 4). If the sediment stabilization, transport, and stockpiling costs were added to the containment alternatives, it would increase the final cost for each by a uniform amount in the range of $ 1 to 2 million. Even with this additional cost, the containment remedy would be substantially less costly than Alternative 4, and Alternative 2 would remain the preferred alternative.

Regarding your comment to include an additional alternative that includes "clean capping material," it should be noted that clean capping material, in the form of 33,000 cubic yards of imported sand and topsoil, is already part of the containment alternatives. With that being said, we conducted a rough analysis of the cost for a low-permeability cover layer composed of native fine-grained pit run. The analysis indicated that the costs for

importing a suitable and consistent source of clay-rich soil, and of grading and compacting this type of moisture-sensitive soil would be in the same range or perhaps higher than the dredged sediment costs. Based on this, adding an additional alternative to the RI/FS is not warranted.

Lummi treaty rights: You mention the comment letter by the Lummis and that they are legally entitled to have a healthy ecosystem restored in partial satisfaction of their treaty rights.

Ecology is not able to comment on the scope of asserted tribal treaty rights. With regard to the Lummi letter, please see our response under Comment #12).

You also indicate that Ecology and the Port should have coordinated their work on the RI/FS with the Lummi tribe, given the tribes purported role as a co-manager of water resources at the site per the 2013 City of Bellingham Shoreline Master Plan.

Ecology has taken a number of steps to coordinate its work on the RI/FS with the Lummi tribe. The tribe is a member of the Bellingham Bay Action Team, which is a multi-organization group meeting every other month to coordinate waterfront cleanup and habitat restoration work. The findings and conclusions of the Cornwall Avenue landfill RI/FS were presented and discussed at two team Action Team meetings. Ecology also sent the Lummi's a copy of the draft RI/FS and solicited their input, to which they responded (see Comment #12).

Lastly, you suggest that the draft RI/FS be rescinded pending further discussion with the Lummi.

Ecology is in discussions with the Lummi Nation regarding cleanup of this Site and others on the Bellingham waterfront. However, we are not rescinding the RI/FS, as it was developed in accordance with MTCA, the governing regulation in Washington for choosing and implementing cleanups.

Comment #41, Wendy Harris

You suggest the RI/FS be revised to accommodate recommendations in the Bellingham Bay Comprehensive Strategy, including an ecosystems-based analysis and an integration of cleanup plans, zoning and land use, and habitat restoration.

All cleanup sites in Bellingham Bay are moving forward with the guidance of the Bellingham Bay Comprehensive Strategy. However, each cleanup must first comply with the requirements of MTCA, including preparation of an RI/FS. The RI/FS is a cleanup document required to provide sufficient information for Ecology to select a remedy for the site that meets the requirements of MTCA. Once Ecology selects a remedy, and it is reviewed by the public, the remedy will be designed and permitted. During the design and permitting process habitat restoration elements will be considered in accordance with the Bellingham Bay Comprehensive Strategy and permitting requirements.

Commingled contamination: You note that sites with overlapping contamination are treated as one site by Ecology.

You are correct in noting that Ecology may treat overlapping sites as one. This convention has been commonly used in situations where site contamination cannot be clearly differentiated or where recontamination could occur absent cleanup of both sites together. It has also been used to facilitate legal settlements between PLPs and Ecology when PLP liability is unclear. In this situation, the Cornwall, Haley, and Whatcom Waterway sites are clearly distinguishable based on distinct contaminant sets and the need for individualized cleanup plans. From the standpoint of an RI/FS, it is highly advantageous to investigate each site separately, and to develop separate cleanup plans appropriate to the unique conditions at each site.

Waterfront District Sub Area Plan: You note that this land use plan has not yet been adopted.

That was correct at the time the draft RI/FS was issued. It has now been approved by both the port and the city. Should the anticipated use of the Site change from a park to some other land use in a manner that requires another cleanup option or a different set of cleanup options to be evaluated, the RI/FS would be supplemented or redone and issued again for public review.

Comment #42, Wendy Harris

This comment claims that the information on fish and wildlife presented in the draft RI/FS is outdated, and specifically with respect to ESA species and habitat.

The current status of ESA listings will be rechecked, and if changes have occurred, the final RI/FS will be modified to reflect those changes.

Comment #43, Wendy Harris

You first comment that the 30-day comment period for the draft RI/FS was inadequate.

Ecology may consider extending comment periods for future cleanup documents beyond the MTCA minimum 30-day length.

You asked what the point of public comment is when cleanup levels have not been determined.

For formal cleanup sites like the Cornwall landfill, final cleanup levels are set in the legal settlement between Ecology and the liable parties. Cleanup levels developed in precursor documents like the RI/FS are therefore, by definition, preliminary, or initial, or draft, although they are in most cases identical to final cleanup levels. For this Site, Ecology considers the preliminary cleanup levels developed in the RI/FS to have been sufficient to develop and compare alternatives, and to select a preferred alternative.

Your next comment is that the future location of institutional control provisions are unspecified in the draft RI/Fs.

> Specificity is inappropriate at the RI/FS stage, as the type and location of institutional controls will depend on the final cleanup design, and to some extent, on the final development plan. Once construction is complete, a deed restriction will be placed outlining the measures necessary to maintain the integrity of the cleanup action in perpetuity.

Your next comment is that groundwater treatment methods are not defined.

> Various groundwater treatment methods are discussed in Section 9.3.2.

You next ask why the biological assessment required during permitting was not completed.

> Cleanup projects need to be fairly well defined in order for the potential effects on federally or state-listed species to be evaluated in a biological assessment. Typically this occurs well beyond the RI/FS stage at the 60% design stage, when permit applications are filed with the appropriate natural resource agencies.

You then indicate that the public is unable to determine the adequacy of the preferred alternative without specific information on the methods to be used to meet cleanup standards, and then cite a number of aspects to the cleanup that were "carried forward for further evaluation."

> The purpose of an FS is to compare alternatives and to choose a preferred alternative based on the criteria outlined in MTCA. For the Cornwall FS, a number of the cleanup elements were identical in each containment alternative, and these are the ones you reference as being carried forward. It was not necessary to developed detailed methodologies or costs for these identical cleanup elements in order to compare the alternatives.

Comment #44, Laura Brakke

Your first indicate support for the Lummi nation concerns.

> Please see our previous response to the Lummi Nation under Comment #12.

You then state that total removal is your preferred cleanup option.

> This issue was also covered under Comment #12.

You propose a plan for hauling excavated materials under Alternative #4 off the property for disposal in Wyoming.

> Using coal trains as a transport would not materially change the costs associated with excavation and disposal, and refilling the site would be an added cost. The outcome of

the disproportionate cost analysis in the FS would therefore not change, and Alternative #4 would still not be considered "permanent to maximum extent practicable" (see our responses to comments #5 and #12).

Your next comment is that the site can only be a "toxic waste repository," a park, or an area with the original habitat restored, not all three.

The preferred alternative would allow each of these functions: Contaminated materials would be contained; a park could be built on top of the contained materials; and existing areas of shoreline and subtidal habitat would be restored.

Finally you note it is difficult for the general public to comment on a project of this size, and that lack of participation by the many should not be construed as agreement with the plan.

Ecology acknowledges the difficulty involved in providing input on a document as complex as the draft RI/FS, and that some portion of the public would not support the preferred alternative.

Comment #45, Helen Brandt

You indicate support for Alternative 4, and note that "future earthquakes, tidal overwash, or sea level rise could disperse the dangerous material." if it was left in place.

Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7) found Alternative 2 to be permanent to the maximum extent practicable.

With regard to your concerns about future seismicity and climate change effects, Ecology recognizes the significance of these environmental factors, and that the severity for some is likely to increase in the future. The draft RI/FS addresses these factors on an initial basis, discussing potential impacts and estimated magnitudes (except seismicity, which will be added to the final RI/FS). They will be addressed again in much more detail in the engineering design report.

Comment #46, Margaret Knight

The sediment PCSs: Your first question relates to the advisability of using PCBs to "reflect trends for cadmium and lead."

The PCB data was not used for trend analysis, but was used specifically to develop an initial estimate of the area in which bioaccumulative compounds exceed sediment

cleanup levels. Ecology considered this approach appropriate for the purposes of evaluating cleanup alternatives and selecting a preferred alternative.

There is no provision testing...: This comment appears to assume that future groundwater monitoring will consist of one sampling event following completion of the cleanup, and only two analytes - manganese and ammonia.

This is not the case. A comprehensive Compliance Monitoring and Contingency Response Plan will be developed for the Site including multiple analytes and an extended period of monitoring.

The organic analyses should: You suggest bioassays and analysis for tentatively identified compounds (TICs) be included as part of the monitoring program.

Benthic toxicity testing will be an element of sediment compliance monitoring, and we will consider your suggestion to include TICs. It should be noted that TICs are primarily useful for "fingerprinting" a leachate or confirming an area of impact when conventional parameters are inconclusive.

RG Haley: You note that close coordination between the Cornwall and RG Haley sites is imperative.

Ecology agrees and intends to work closely with the city and port in coordinating cleanup design and construction to maximize efficiency, minimize costs, and ensure environmental protection.

Preferred option: You indicate a preference for Alternative #3 based on more infiltration control, a more robust geomembrane, and a thicker sediment cap.

Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable.

The exact characteristics of the cap will be determined during engineering design, with the intent that it function as intended in perpetuity. Also, the effectiveness of the measures used to prevent water infiltration under Alternative 2 will be monitored closely to confirm that groundwater discharge into the bay meets cleanup levels.

Comment #47, Bob Burr

Your first comment is that you believe Alternative #3 is better than Alternative #2, based on a more robust liner, a thicker sediment cap, and less groundwater infiltration.

Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7) found Alternative 2 to be permanent to the maximum extent practicable.

The exact characteristics of the cap will be determined during engineering design, with the intent that it function as intended in perpetuity. Also, the effectiveness of the measures used to prevent water infiltration under Alternative 2 will be monitored closely to confirm that groundwater discharge into the bay meets cleanup levels.

With regard to the liner, Ecology acknowledges that 20 mil scrim reinforced polyethylene sheeting could be difficult to weld. Ecology's expectation is that it would be seamed by sewing and then taping the seams rather than welding. Ecology would require that performance standards be established for the integrity and water tightness of the seams, and that quality assurance testing be conducted during construction to demonstrate that the seams meet the performance requirements. Further evaluation of the liner will occur during engineering design, and a product will be specified that is expected to fulfill its physical separation and hydraulic barrier functions in perpetuity.

Ecology also acknowledges your concern regarding the thickness of the 20 mil scrim reinforced polyethylene layer material relative to an HDPE layer. However, the combination of a drainage layer, the 20 mil geomembrane, and a low-permeability sediment layer exceeds the performance requirements specified in both WAC 173-304 and WAC 173-351 for minimizing infiltration. In addition, our initial evaluation has shown that polyethylene is chemically resistant and has an essentially unlimited life expectancy in the subsurface once installed. Ecology will require that the physical properties of the synthetic geomembrane layer be further evaluated during engineering design, and could require the use of a different liner material if warranted based on results of that evaluation. Ultimately, a geomembrane will be specified that is expected to fulfill its physical separation and hydraulic barrier functions in perpetuity.

With regard to the Alternative #2 sediment cap, Ecology is fully aware of and concerned about the risks to marine organisms and humans. The actual thickness and extent of the sediment cap will be developed during the engineering design phase of the cleanup, when further oceanographic studies will be conducted and a more precise definition of site boundaries developed. Further refinement of the cap design will also occur during the permitting phase, when agencies and groups responsible for fish and wildlife

management conduct their detailed reviews. Ultimately, Ecology's goal is to implement a sediment restoration program that meets regulatory requirements and is protective of human health and the environment in perpetuity.

Your next comment requests that sediment cleanup levels protective of the bioaccumulation pathway be set for lead, mercury, cadmium, dioxins/furans, and PAH, and PCBs.

Ecology is very aware of this exposure pathway and is intending to set cleanup levels for all of the bioaccumulative compounds associated with the Cornwall landfill site. A cleanup level at the detection limit was set for PCBs in the draft RI/FS (see Table 5-1). Page 8-5 of the text also mentions that all of the bioaccumulatives will need to be considered during development of the CAP, and cleanup levels may be developed at that time. Ecology is not intending to set sediment cleanup levels for mercury, dioxins/furans, and PAHs for the Cornwall site, but will use the cleanup levels that have been or are being developed for the adjoining Whatcom Waterway and RG Haley sites, where these compounds are characteristic of the type of releases that occurred.

You then ask that Ecology "price out" an alternative that removes some of the waste material at the site, specifically just the dredged sediment or the marine refuse and wood debris.

Ecology assumes that "marine refuse" refers to the interim action dredged sediment placed on the site. Removing this material would not result in additional environmental benefit. The material contains contaminant types and levels similar to those that likely already exist at the site, especially where the adjacent RG Haley site overlaps the Cornwall site. While there is not an environmental benefit to removing the material, there is an environmental benefit and a cost savings if it is left in place. It is a ready-made source of fine grained material suitable for reducing infiltration under containment Alternatives 1 - 3.

With regard to removal of the wood waste, that would require taking out almost the entire landfill first, since the wood waste underlies refuse in many areas.

Your next comment references the 2004 Waterfront Futures Plan, and suggests that the marine habitat protection in the preferred alternative is a "retreat" from the plan.

All cleanup sites in Bellingham Bay are moving forward under the guidance of several land use planning documents including the Bellingham Bay Comprehensive Strategy and the futures plan you referenced. However, each cleanup must first comply with the requirements of MTCA, and part of that is preparing an RI/FS. The RI/FS is a cleanup document required to provide sufficient information for Ecology to select a remedy for the site. Once Ecology selects a remedy, and it is reviewed by the public, the remedy will be designed and permitted. During the design and permitting process, habitat restoration elements will be considered in accordance with the various comprehensive plans and based on input from the permitting agencies. Ecology also intends to work closely with the city in developing a cleanup design that accommodates, to the degree possible, habitat enhancement and land use plans developed by the city through its public review process.

Your next-to-last comment mentions that the Cornwall landfill cleanup must be considered in concert with other sites, especially the adjacent RG Haley site.

Ecology agrees.

Finally, you ask that we remember the Lummi Nation's role in land stewardship, and that the Lummi's must sign off on the cleanup plan.

We recognize the importance of the Lummi Nation's role, and have been coordinating with them through the Bellingham Bay Demonstration Pilot initiative.

Comment #48, Galen Herz

You first indicate a preference for Alternative #3 based on a thicker sediment cap and a more robust liner.

Please refer to our response on Comment #47 with respect to these issues.

Comment #49, Mary Bell

Your comment is that the preferred alternative, #2, does not actually clean the Site and that the dredged sediment should be removed.

Ecology acknowledges your preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. MTCA allows for a cleanup action that contains contaminated materials, rather than remove them, provided the selected cleanup action meets a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable.

With regard to the dredged sediment, this material does contain typical urban contaminants, including dioxins/furans at concentrations between 10 and 20 parts per trillion (ppt). Dioxins/furans are ubiquitous in the environment as a product of natural processes (e.g. forest fires) and human activities (e.g. pulp and paper mills and wood treatment operations). Although an urban soil background value has not been established for the City of Bellingham, concentrations detected in the dredged sediment are close to or below urban soil background concentrations found in Seattle neighborhoods (25.8 ppt). Regardless, using this sediment as a low-permeability fill beneath a synthetic liner and two layers of earthen material (topsoil, drainage layer) will eliminate direct contact with the dredged sediment. It will also reduce water infiltration into the landfill thereby reducing the discharge of groundwater to the bay. Post construction monitoring will evaluate compliance with cleanup levels, and contingency measures will be taken as

necessary. A compliance monitoring and contingency response plan will be included in the future engineering design report that will be issued for public review.

Comment #50, Alexander Chadsey

You first indicate a preference for Alternative #3 because it is "more protective."

Please refer to our response on Comment #47 with respect to this issue.

You next indicate that the site should be restored to provide healthy habitat, and cite a provision in the Bellingham SMP requiring no net loss of ecological function. You specifically mention being concerned about eelgrass and being desirous of a vegetative corridor from water to upland. You also request that the public be able to review any eelgrass design and mitigation plan.

All cleanup sites in Bellingham Bay are moving forward under the guidance of several land use planning documents including the Bellingham SMP. However, each cleanup must first comply with the requirements of MTCA, including preparing an RI/FS. The RI/FS is a cleanup document required to provide sufficient information for Ecology to select a remedy for the site. Once Ecology selects a remedy, and it is reviewed by the public, the remedy will be designed and permitted. During the design and permitting process, habitat restoration elements will be considered in accordance with the various comprehensive plans and based on input from the permitting agencies. Ecology also intends to work closely with the city in developing a cleanup design that accommodates, to the degree possible, habitat enhancement and land use plans developed by the city through its public review process. Ecology will present the results of these efforts in an engineering design report that will be available to the public.

Comment #51, Tim Goodman, Washington State Department of Natural Resources

Your letter indicates support for the preferred alternative, and pledges continued cooperation in the cleanup of this Site.

Ecology thanks DNR for their pledge of continued cooperation and partnership.

You also indicate concern about proceeding with a Cornwall cleanup before the MTCA process has been completed at the adjacent Haley site, given the overlap in site contamination.

Ecology agrees, and intends to work closely with the city and port in coordinating cleanup design and construction for the two sites to maximize efficiency, minimize costs, and assure environmental protection.

Comment #52, Sandy Robson

First, you indicate support for removal (Alternative #4), and if that is not possible, then Alternative #3.

> Ecology acknowledges your preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. MTCA allows for a cleanup action that contains contaminated materials, rather than remove them, provided the selected cleanup action meets a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7) found Alternative 2 to be permanent to the maximum extent practicable.

You next indicate that the site should be restored to provide healthy habitat, and cite a provision in the Bellingham SMP requiring no net loss of ecological function. You specifically mention being concerned about eelgrass and being desirous of a vegetative corridor from water to upland. You also request that the public be able to review any eelgrass design and mitigation plan.

> All cleanup sites in Bellingham Bay are moving forward under the guidance of several land use planning documents including the Bellingham SMP. However, each cleanup must first comply with the requirements of MTCA, including preparing an RI/FS. The RI/FS is a cleanup document required to provide sufficient information for Ecology to select a remedy for the site. Once Ecology selects a remedy, and it is reviewed by the public, the remedy will be designed and permitted. During the design and permitting process, habitat restoration elements will be considered in accordance with the various comprehensive plans and based on input from the permitting agencies. Ecology also intends to work closely with the city in developing a cleanup design that accommodates, to the degree possible, habitat enhancement and land use plans developed by the city through its public review process. Ecology will present the results of these efforts in an engineering design report that will be issued for public review.

Finally, you ask that a beach be considered at the southwest end of the cleanup site per the Waterfront Futures Group (2004).

> Land use planning is beyond the scope of Ecology's authority at the Site. However, we do intend to coordinate closely with the city in developing a cleanup design that accommodates, to the degree possible, land use plans developed by the city through their public review process.

Comment #53, Hal Glidden

You indicate opposition to using the dredged sediment as part of the cover system because of concerns about public safety.

Ecology acknowledges your concern, but is confident using this material as a low-permeability fill beneath a synthetic liner and two layers of earthen material (topsoil, drainage layer) will be protective of human health, and will have the benefit of reducing water infiltration into the landfill. The cover system will be designed to maintain protection in perpetuity.

Comment #54, Helen Glidden

You indicate that various natural and chemical processes (climate related, tidal, shoreline erosion, earthquake induced changes, leaching toxins, etc.) could compromise the proposed cleanup, and that something other than a "band-aid" approach to cleanup should be used. You also state that safety should be of paramount importance.

Ecology recognizes the significance of these environmental factors, and that the severity of impact for some is likely to increase in the future. The draft RI/FS addresses the natural factors on an initial basis, discussing potential impacts and estimated magnitudes (except seismicity, which will be added to the final RI/FS). They will be addressed again in much more detail in the engineering design report. That report will include a detailed evaluation of effects, and a description of methods to compensate for those effects. Because safety is of paramount importance, the key focus of the engineering effort will be to develop a design that protects the site in perpetuity.

With regard to the preferred cleanup, Alternative #2 is not a Band-Aid approach, but an established methodology that has been used at many MTCA sites and many (perhaps most) municipal landfills in Washington.

Comment #55, Pam Borso

You indicate support for Alternative #3, based on a thicker liner and sediment cap.

Ecology acknowledges your preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. MTCA allows for a cleanup action that contains contaminated materials, rather than remove them, provided the selected cleanup action meets a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable.

Please refer to our response on Comment #47 with respect to the liner and sediment cap.

Comment #56, Wendy Steffensen, North Sound Baykeeper Team and RE Sources

Comment period: *Your letter notes that many people found the 30-day comment period to be too short, and in many cases were not even aware of the comment period until weeks after it started. You requested a 60 day comment period for future cleanup-related documents.*

> Ecology regrets that some people were unable to use the full 30-day review period, and will consider ways to improve the notification process. For future cleanup documents, we may consider extending comment periods beyond the MTCA minimum 30-day length.

Revision to DCA: *This paragraph notes agreement with the Lummi Nation letter of Sept. 13, 2013, and echoes their request for revisions to the DCA.*

> Our response to the Lummi Nation request was as follows in referring to the inclusion of historical costs in the DCA: "This is an area where MTCA is clear, defining the costs used in the DCA as: "... construction, the net-present value of any long-term costs, and the agency oversight costs that are cost recoverable" WAC 173-340-360(3)(f)(iii). As a result, we cannot modify the DCA in the requested manner." Please see Comment #12 for the full text of our response to the Lummi Nation.

Re Sources preferred alternative: The letter states that Re Sources prefers Alternative #3.

> Ecology acknowledges this preference, but must operate within the scope of its authority, as defined by the Model Toxics Control Act (chapter 70.105D RCW; MTCA), and in accordance with the dictates of the accompanying MTCA regulations WAC 173-340. Per MTCA, the selected cleanup action must meet a number of requirements, including the requirement to be "permanent to the maximum extent practicable" WAC 173-340-360(2)(a)-(b). To make this determination, we employ the disproportionate cost analysis WAC 173-340-360(3). For the Cornwall site, the DCA (Section 9.7) found Alternative 2 to be permanent to the maximum extent practicable.

Liner: The synthetic liner in Alternative #3 is proposed as being preferable based on it being sturdier and longer lasting.

> The functional characteristics of the liner will be considered further during engineering design, with the intent to specify a product that functions as intended in perpetuity.

Groundwater diversion barrier: You describe the importance of preventing water from entering the landfill, and indicate support for the groundwater diversion barrier proposed under Alternative #3.

> Reducing water infiltration is extremely important, and a diversion barrier would prevent more water from entering the landfill than the measures included under Alternatives #1 or #2 alone. However, as noted above, the DCA (Section 9.7 of the RI/FS) found Alternative 2 to be permanent to the maximum extent practicable, and as a result, the

preferred alternative under MTCA. The diversion barrier is a relatively costly method for adding redundancy to the measures in Alternatives #1 and #2 that are already expected to result in the site meeting groundwater cleanup levels. This will be verified through compliance monitoring.

<u>In-water sediment cap</u>:A request is made to institute a "full isolating cap" due to an existing risk to marine organisms and humans who may consume seafood, and the point is made that even the proposed 18-inch cap under Alternative 3 may not be adequate given the uncertainty on where erosion and deposition is occurring.

The actual thickness and extent of the sediment cap will be developed during the engineering design phase of the cleanup, when further oceanographic studies will be conducted and a more precise definition of site boundaries developed. Further refinement of the cap design will also occur during the permitting phase, when agencies and groups responsible for fish and wildlife management conduct their detailed reviews. Ultimately, Ecology's goal is to implement a sediment restoration program that meets regulatory requirements and is protective of human health and the environment in perpetuity.

<u>Dioxin waste layer upland cap</u>: The statement is made that the "dioxin cap" is a waste material and not appropriate as a cap, and a request is made that it be removed as part of Alternative #3.

The material being discussed is not a waste material, but natural bay sediment, containing 5% cement for strength and handling purposes. The dredged sediment does contain typical urban contaminants, including dioxins/furans at concentrations between 10 and 20 parts per trillion (ppt). Dioxins/furans are ubiquitous in the environment as a product of natural processes (e.g. forest fires) and human activities (e.g. pulp and paper mills and wood treatment operations). Although an urban soil background value has not been established for the City of Bellingham, concentrations detected in the dredged sediment are close to or below urban soil background concentrations found in Seattle neighborhoods (25.8 ppt). Regardless, using this sediment as a low-permeability fill beneath a synthetic liner and two layers of earthen material (topsoil, drainage layer) will eliminate direct contact with the dredged sediment. It will also reduce water infiltration into the landfill thereby reducing the discharge of groundwater to the bay. Post construction monitoring will evaluate compliance with cleanup levels, and contingency measures will be taken as necessary. A compliance monitoring and contingency response plan will be included in the future engineering design report that will be issued for public review.

The letter goes on to object to using the dredged sediment because the theory and practice of waste material beneficial use has not been discussed on a "community-wide basis," and because of the possibility that rising sea levels or tsunamis could inundate the site causing greater dioxin/furan mobility and release to the environment.

In 2011, the public was provided an opportunity to review the MTCA interim cleanup action plan that described use of the dredged sediment at the Site. The interim action was also subject to public notice and review through SEPA.

With regard to the inundation concerns, Ecology agrees that design work for the cap will need to carefully consider the effects of storm flooding or a tsunami wave on cap integrity and the potential for contaminant release to the environment. These topics will be addressed in the engineering design report.

Soft bank/beach: As another add to Alternative #3, the letter proposes a pocket beach or soft shore bank at the southern edge of the site, and requests that decisions not to take these actions be documented for public review..

Land use planning is beyond the scope of Ecology's authority at the site. However, we do intend to coordinate closely with the city in developing a cleanup design that accommodates, to the degree possible, land use plans developed by the city through their public review process.

Wood waste: An explanation is requested of the physical cleanup criteria for woodwaste in sediment, and of why bioassays were not conducted to develop these criteria, as done at the Scott Paper Mill site.

The 2008 criteria referenced in the draft RI/FS were based on an earlier 1997 guidance document prepared by the Army Corps of Engineers and Ecology for evaluating wood waste risk to the benthic community. This guidance document recommended wood waste criteria be developed considering site specific conditions (wood distribution; TOC, ammonia, and sulfide concentrations; sediment grain size; depositional environment; local benthic health, etc.), and in accordance with the following general criteria:

1. Wood and wooden debris occupying more than 50% of a given volume of sediment is to be removed and disposed of on land.
2. Wood and wooden debris occupying between 50% and 25% of a given volume of sediment should be tested for toxicity (bioassay), and removed if it fails.
3. Wood and wooden debris occupying less than 25% of a given volume of sediment can be left in place.

These criteria were modified for the draft RI/FS by stipulating no more than one foot of sediment with more than 50% wood waste, or at least one foot of clean sediment over areas with more than one foot of sediment with more than 50% wood waste. The modified criteria are acceptable as preliminary cleanup criteria for purposes of the RI/FS, but Ecology plans to conduct additional testing (e.g., bioassays) during the design phase to confirm protectiveness.

Bioaccumulative toxins: This comment asks that subsistence fishers and pregnant women and children who eat fish be listed as potential receptors, and that fish consumption rates "reflect reality," rather than those in statute. A request is also made to develop sediment cleanup levels for the bioaccumulatives cadmium, lead, cPAHs, in addition to PCBs, and include them in the RI/FS.

Ecology intends to establish cleanup levels for all of the bioaccumulative compounds associated with the Cornwall landfill site. A preliminary cleanup level at the detection limit was set for PCBs in the draft RI/FS (see Table 5-1). Page 8-5 of the text also mentions that all of the bioaccumulatives will need to be considered during development of the CAP, and cleanup levels may be developed at that time. This approach is appropriate for the purposes of evaluating cleanup alternatives and selecting a preferred alternative. Ecology is not intending to set sediment cleanup levels for mercury, dioxins/furans, and PAHs for the Cornwall site, but will use the cleanup levels that have been or are being developed for the adjoining Whatcom Waterway and RG Haley sites, where these compounds are characteristic of the type of releases that occurred.

The comment is made that the term "preliminary cleanup levels" doesn't make sense, and that the public should be able to weigh in on the cleanup levels.

For formal cleanup sites like the Cornwall landfill, final cleanup levels are set in the legal settlement between Ecology and the liable parties. Cleanup levels developed in precursor documents like the RI/FS are therefore, by definition, preliminary, or initial, or other term that implies not being final. To add to the complexity, most RI/FS documents have two tiers of non-final cleanup values, with the first termed "screening" levels, and the second "preliminary" levels. The public's ability to weigh in on cleanup levels comes through public comment periods for the draft RI/FS, for the Cleanup Action Plan/Consent Decree, and occasionally the Engineering Design Report. The RI/FS text will be modified to clarify the meaning of preliminary cleanup levels.

A final comment in this subsection asks why dioxin was not analyzed in sediment and soil at the site.

For the Cornwall site, Ecology is making the conservative assumption that contamination in soil/wood waste/refuse is present at concentrations exceeding cleanup levels. Sampling for dioxins or other contaminants in soil was therefore unnecessary. With regard to sediment, Ecology assumes it also contains dioxins/furans exceeding cleanup levels. However, they are likely attributable to the Haley site. The extent of dioxins in sediment will be determined through field investigations for the Haley site.

Shoreline Master Program (SMP): Requests are made to replace eelgrass that may be lost, to plant native vegetation, and to build a wildlife corridor as part of the cleanup action.

Ecology is supportive of improving habitat, and appreciates these land use/habitat restoration suggestions. Decisions regarding these suggestions will be made during final design and permitting. Ecology intends to coordinate closely with the city (and other agencies) in developing a cleanup design that accommodates, to the degree possible, land use/habitat restoration plans developed by the city through their public review process.

<u>Cost benefit analysis</u>: The comment is made that the cost-benefit analysis (CBA) is subjective, and a request is made to redo the CBA using O&M costs that extend out 150 years, rather than the 20 years used in the draft RI/FS. A request is also made to see the public's preference for Alternative 3 reflected in a recalculation of the CBA.

Ecology assumes the CBA being referred to is the MTCA disproportionate cost analysis (DCA). Ecology strives to remove subjectivity from the DCA process by using a numerical ranking scheme.

As you correctly note, O&M costs are projected for 20 years, as is standard for this kind of analysis. Once the capping system is constructed, only limited maintenance should be required, consisting primarily of periodic groundwater compliance monitoring, shoreline stabilization system patching, and repairs to the upland cap (low-permeability soil, geomembrane, drainage layer, and topsoil).

As per your request, the DCA will be recalculated based on the public's apparent preference for Alternative #3.

<u>RG Haley</u>: A request is made to clean the Haley site and the Cornwall site together to preclude recontamination.

Ecology agrees that coordinating cleanup of the two sites is essential to ensure that both will meet cleanup standards.

<u>Characterization concern</u>: A request is made to determine the composition of a black viscous material discovered at the site, and a comment is made that this discovery (plus who knows what else might be out there) illustrates the need for full isolation or removal of the refuse.

Ecology has developed cleanup alternatives which accomplish full isolation or removal, and these alternatives do not require knowledge of the black material to be implemented. However, further investigation may be undertaken during the engineering design phase if additional data is needed to properly design a grading plan or the cap.

<u>Monitoring</u>: You indicate support of Margaret Knight's comments on monitoring (comment #46).

Please see our response to that comment.

<u>Earthquake and tsunami risk</u>: The comment is made that these two topics are inadequately discussed, and that the RI/FS should address their risk.

> You correctly note that the draft RI/FS does not include a discussion of seismic risk as it relates to site stability. We will revise the RI/FS accordingly. The draft RI/FS does, however, discuss seismicity as it relates to the potential for tsunamis (Section 4.1.5.4). Ecology recognizes the significance of these environmental factors, and their potential impact on the site. They will be addressed again in the engineering design report, which will include a detailed evaluation of effects, and a description of methods to compensate for those effects. The key focus of the engineering effort will be to develop a design that protects the site in perpetuity.

APPENDIX A – Comments received

Map as to.

The source of the seep is the upgradient petroleum contamination that we have known about for many years, and it is located near the northern edge of the Cornwall Avenue landfill. A comprehensive discussion of the character and distribution of the contamination will be presented and discussed in the next deliverable for the site – a draft remedial investigation and feasibility study report expected to be issued for public review in the Spring of 2014.

Regarding the barrels at the Cornwall Avenue landfill site, they contained water and soil generated during environmental investigations at that site (e.g., excess soil from drilling monitoring wells, water from decontaminating sampling equipment, etc). It is standard practice in the industry to barrel these types of materials, and store them temporarily onsite until they can be transported offsite for disposal. The barrels are now gone; Burlington Environmental LLC managed the transport, treatment and disposal of the wastes at their Kent, Washington facility.

Comment #5
May 14, 2013
Washington State Department of Ecology
1440 10th Street Suite 102
Bellinham, Washington 98225
Re: Bellingham Waterfront Cleanup

This effort stirs up waste that should be left where it is. It is a waste of our financial resourcess to attempt clean up.
Thank you,
Joel Douglas

Response #5
The state Model Toxics Control Act (chapter 70.105D RCW) was passed by citizen initiative in 1989. Under the law, hazardous substances that pose a threat to human health and the environment must be addressed.

"Cleanup"
This is more Dispersion and Dangerous waste of Resources!
We NEED to do realistic and let well enough alone!

Joel Douglas
600 Linden Road
Bellingham, WA 98225

(1)

August 22, 2013

Department of Ecology
3190 160th Avenue NE
Bellevue, WA 98008-5452
Attention: Mark Adams, Site Manager
RE: Cornwall Avenue Landfill Cleanup Site & Cherry Point/Salish Sea

Dear Mr. Adams,
I am writing as a resident who lives a few blocks away from Cornwall Avenue Landfill Cleanup Site, and am present at today's meeting. These are my concerns and solutions:

- Site History has HUGE oversight because it does not include or acknowledge real history of violations of Native American Treaties by corporate interest with the protection of USA Military specifically land now known as Cherry Point in the Salish Sea: For this please include and acknowledge the enclosed report by Jewell Praying Wolf James, Lummi tribal member and director of the Lummi Nation's Sovereignty and Treaty Protection Office.
- Environmental Investigation & Contamination from Neighboring sites, that is found in your reports is definitely part of the current business industries of BP Oil, Alcoa Intalco Works, Peabody Coal & Mining, Pacific International Terminals, SSA Marine, Carrix, Inc., Goldman Sachs, Wall Street Investors, Edelman PR Firm for Alliance for pro-terminal group Alliance for Northwest Jobs, and other mining of natural resources businesses. Please include chemical companies whose products are and were used; and, related businesses that profit without a conscious as do insurance, banks and investment companies. All polluters must take total responsibility for damage caused.
- Cost and funding Taxpayers are fed up with bailouts and taxes misused. The above mentioned businesses must no longer be allowed to operate irresponsibly. I am absolutely appalled by Supreme Court decisions that continue to allow injustice to prevail from past real history and current history (Dick Chaney's business profiting and wars resulting). $9.1 million expected cost to cleanup Cornwall Avenue Landfill site should be paid by companies named above.
- Future Land Use: Please honor the Lummi & Native American treaties without any Bureau of Indian Affairs **or** non-native religious group interference, as was done in the past. I am grateful and have faith in the "Sacred Obligation" of the Lummi Nation (Xa xalh Xechnging); and unite with others respectfully to honor our Sacred Mother Earth.

In closing, I thank you and those assisting to clean up and stop further environmental crimes from being allowed to happen. Please share this letter with Dustin Terpening, Communications Manager Bellingham Field Office, Linsay Albin, Administrative Assistant and any other official who may assist in this very important matter. Also, please continue to assure the public of your progress for the best and highest good.

Sincerely,

Carole Edrehi, 901 N. Forest St. #125, Bellingham, WA 98225

DEPARTMENT OF ECOLOGY
State of Washington

Comments, questions or concerns

Consider long-term expansion of a high-stack boatel removing derelict/toxics into BNSF as downtown Bellingham revitalizes in response to the economic muscle that develops as a result!
(see attached)

- Cut-walls/parks development simultaneously -

Contact information (optional)

Name: Tony Montoya City: Fairhaven

Email:
(Would you like to receive email updates from Ecology? ✓ Y ___ N)

Project website

www.ecy.wa.gov/programs/tcp/sites and search for the site name Cornwall Ave.

Mail completed form to

Mark Adams, site manager
Department of Ecology
3190 160th Ave. SE
Bellevue, WA 98008-5452

Or email comments to mark.adams@ecy.wa.gov.

(B5)

DEPARTMENT OF ECOLOGY
State of Washington

Comment form

Cornwall Ave Landfill cleanup site public meeting

Aug. 28, 2013

Please fill out the comment form so we will have a record of your ideas and opinions. You may return it to any member of the Ecology project team or mail to the address on the back.

What is your interest in the cleanup project?

( ) Live near the cleanup site.
( ) Work near the cleanup site.
( ) Own or operate a nearby business.
(✓) Interested citizen.
( ) Other: _____

How did you hear about this open house?

(✓) Newspaper. If so, which one? HERALD
( ) Radio
( ) Mail notice
( ) Ecology website
( ) Friend, coworker, neighbor
( ) Other: _____

Email updates

Would you like to receive email updates about this project? If yes, please print your email address clearly:

Tmymontoya@msn.com

To share your contact information and give us additional comments, please see the back of this form.

DOWNTOWN!

LETTERS TO THE EDITOR

Offers plan for downtown

Back in January, Darby Cowles excellently presented the downtown revitalization issue. I walked out onto Bay Street, discovered the new Pickford theater location, saw the coffee shop across the street and thought"wow, wouldn't it be wonderful if visiting boaters could walk up onto Bay Street from slips on Whatcom Creek?"

The next morning I heard how Arnie Hanna refused to push no parking meters and angled parking. Then, I made a call and learned that there's too much fetch from southerlies for docks on Whatcom Creek.

Last Monday, while returning from the waterfront on my bike, I turned onto the old roadway between the creek and the old Grainery building. Voila! Remove that roadway, put a concrete wall against the Grainery's foundation, do some dredging and 15 to 18 32- to 42-foot docks suddenly should become viable with ample protection from southerlies.

Then, that night, I attended initial public testimony before the City Council on the port planning commission report. Toxins, parks, holding pond and standards for living-wage jobs but not once any mention of downtown.

My inclination, now, is small steps, first things first! Get rid of those meters. Put visitor berths for 30 or so boats tight to the Granary building. Put a high-stack boatel on Cornwall Beach, moving toxins inland in the process. Then watch the tax base on the bay side of South Hill explode while downtown with minimal angle-parked big rigs — due to the boatel — reinvigorates itself and our poverty rate drops to least in the state!

Terry Montonye
Bellingham

http://images.marinas.com/med_res_id/115719

Cornwall Avenue Landfill RI/FS Comments
Lee First

September 17, 2013

Mr. Mark Adams, Ecology Site Manager
3190 160th Avenue NE
Bellevue, WA 98008-5452

To: Mr. Mark Adams

RE: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

Thank you for accepting these comments on the Draft Cornwall Avenue Cleanup Site Remedial Investigation and Feasibility Study Report (Report). In my capacity as the Pollution Prevention Specialist for the North Sound Baykeeper team, I am especially invested in a permanent cleanup solution for this site. My past employment included 10 years as a Washington State certified landfill operator (with the City of Centralia). I was employed by the City of Centralia during the closure of the Centralia Landfill, in 1994. My comments are as follows:

1. Section 4.5 Historic and Cultural Resources states that the site is in a potentially archaeologically-sensitive landscape that once included tide flats or beach areas. According to the Lummi Nation, Lummi Nation's use of this site is protected by treaty rights, and their use of it was curtailed by dumping wood waste and then garbage without permission. This site should be restored so it once again can provide healthy habitat areas that support the Lummi Nation's treaty rights and usual and accustomed fishing areas.

2. Section 4.6 Land and Navigation Use states that navigation uses offshore are largely transitory, with vessels coming into and traveling out of the Whatcom Waterway, to the Bellingham Shipping Terminal and barge docking area northwest of the RG Haley property. This section omits mentioning recreational uses by kayakers and other small watercraft users who frequently launch at the Community Boating Center and other areas. Many small watercraft users paddle along the shore in this area, and they stop and rest frequently at Boulevard Park and other places. These users will be stopping at the new Cornwall Park, so please consider their health and safety when planning the marine site cleanup.

3. The current solid waste handling rules, Chapter 173-351 WAC CRITERIA FOR MUNICIPAL SOLID WASTE LANDFILLS, requires a "composite liner" consisting of two components; the upper component must consist of a minimum of 60 mil thickness high density polyethylene (HDPE) geomembrane.

The preferred cleanup option outlined in the Report (option 2) proposes a 20 mil scrim reinforced polyethylene liner. Chapter 173-351 applies to sites that have not received waste after October 9 1991, however, we request that the

more protective liner requirements outlined in 173-351 should be employed at this site, which is located on a marine shoreline and is a planned park. The combination of dynamic landscape processes and potential for public exposure at this site warrant this extra protection. In addition, the fine grained sediment dioxin-containing waste cap is a waste that has been imported to the site recently (2011). In fact, the dioxins/furans in the sediment are listed as "compounds exceeding preliminary cleanup levels" in a recent Department of Ecology Powerpoint (August 28, 2013).

4. Appendix A-4 of the *Interim Action Workplan* (2011) states that Class C and F fly ash were mixed into the fine-grained sediment dioxin-containing material, along with various percentages of Portland cement. Cement kiln dust (CKD) is the fine-grained, solid, highly alkaline **waste** removed from cement kiln exhaust gas by air pollution control devices (EPA, http://www.epa.gov/osw/nonhaz/industrial/special/ckd/). Since this waste was stockpiled at the site after October 9 1991, we request that the more protective liner requirements outlined in 173-351 be employed.

5. The 47,000 cubic yards of fine-grained dredge spoils (dredge spoils) from the Squalicum Marina was mixed with Portland cement, resulting in a hydraulic conductivity of 4 X 10^{-7}cm/sec when tested after being placed during the interim action[1]. We do not know what the hydraulic conductivity is today, but when the dredge spoils were tested three years ago, they did not meet the hydraulic conductivity requirements of 173-351-300(3) for the use as a landfill cover material. It is premature to assume that the dredge material will be suitable for lower unit of a composite liner system.

6. We are concerned that the 47,000 cubic yards of dredge spoils have not been adequately quality control tested to be suitable for the lower unit of the composite liner system. If the dredge spoils contain sharp objects, wood, or rocks, these items could puncture the overlying geotextile during placement of overtopping layers of topsoil. Furthermore, we have questions about the processing of the dredge spoils and whether all of it was visually inspected for impurities. This material was screened to remove large debris (>12") to remove debris and then fed through a dual auger pug mill (Brian Gouran, email correspondence September 3 2013). Even with screening and mixing, we are concerned that sharp objects still exist, which could puncture or weaken the overlying geotextile liner. It is unknown if the dredge spoils are too wet or dry to be compacted. How will oversize particles be removed, and how will clods of material be pulverized? We are concerned that this material will jeopardize the geomembrane material without further testing and processing.

7. We request that a test pad be constructed so that the hydraulic conductivity of the dredge spoils can be field tested. This will serve to

[1] Page A-5, Cornwall Avenue Landfill Interim Action Plan, 2011

evaluate it's susceptibility to damage from sharp objects, damage from clods or the overlying drainage layer placement.

8. A total of 8 samples of the dredge spoils were obtained, three from before dredging, and five from after dredging. A number of metals, cPAHs, dioxins and furans were detected that were above screening levels. We request that additional samples be taken from this material to achieve representative samples.

9. We are concerned that the 20 mil scrim reinforced polyethylene liner (proposed liner) is not a satisfactory material for this cleanup action. The site is a planned park, and because of its location along Bellingham Bay; it is subject to dynamic landscape processes including wind and wave action. The proposed material has less tensile strength than high density polyethylene (HDPE), but most notably, it is much thinner than the majority of the liners that are used for capping most landfills in Washington State. The technology and the materials exist for thicker materials that are resistant to chemicals and stress cracks, and when these are used, a highly reliable containment is achievable. We request that a thicker, more durable material be used for this project.

10. The 20 ml scrim reinforced material has a warrantee of 30 days (https://mail-attachment.googleusercontent.com/attachment/u/0/?ui=2&ik=2858d65eac&view=att&th=14127e7b67f913fe&attid=0.1&disp=inline&safe=1&zw&saduie=AG9B_P9AUc6ahcCImdMUQ-SEcCol&sadet=1379354986731&sads=VCnIcr5Tx5wQJYtghqJPNDOVVZQ) years. According to two major suppliers of this material (Tony Bond, Northwest Linings and Geotextile Products and Jason Treiger, Americover Inc), geotextile installers typically offer warrantees for the these materials. Both representatives listed here state that the 20 mil scrim reinforced material is very difficult to field weld because it is thin. We spoke with Raven Industries, the manufacturer of "Dura-Skrim R20WW" which is the manufacturer of the proposed geotextile to be used on the site. They report that this material is problematic to weld in the field. Because of its thinness, most installers sew or tape each seam. Sewing and taping is not as effective as welding to keep the cover from leaking. A cover this size will require thousands of linear feet of sewing and taping. A patchwork of inferior seams (i.e, sewing and taping) will not result in a protective cover.

11. We are in favor of using a material that has at least a 40 year installed warrantee. 60 mil HDPE has a design life of 30-45 years, and has warranties available from 5-20 years for additional costs. A short warrantee does not meet the intent of WAC 173-340-360(3)(f) which states the cleanup action should be "permanent to the maximum extent practicable."

12. There exists proven high-strength heat welding techniques for 60-, 80-, and thicker HDPE that provide a high quality, test-certified installation. We

were unable to find any documentation that similar high quality welds were achievable, and test-certified, for 20 mil materials. Therefore, we request that thicker materials be used on this site so that human and environmental health is protected from the underlying waste.

13. Most damage observed in geomembrane liners arises during covering the geomembrane with drainage and soil layers. For this reason it is especially important to use a thicker liner that is capable of strong, long-lasting seams.

Lee First

Lee First
1814 W North St
Bellingham WA 98225
leefrider7@gmail.com

[1] *Costs and Benefits of Geomembrane Liner Installation CQA*, G.T. Darilek and D.L. Laine, Leak Location Services, Inc., USA. 2001

18 Sep 13

Morgan Brunstrom
3011 Bennett Drive
Bellingham, WA 98225

Mark Adams
Dept of Ecology
3190 160th Avenue NE
Bellevue, WA 98008-5452

re: Cornwall Avenue Landfill Cleanup site in Bellingham, WA

Dear Mr. Adams:

I submit comments on the RI/FS report on referenced site.

The report is flawed in that it ignores the full historic site usage and provides no remediation for United States Treaty violations by Bellingham.

The report also does not consider the long term costs of repair and maintenance of caping the site. The preferred method of caping, which is listed as the cheapest cost, is the most expensive when long term costs are included.

The best choice is removal of toxic material. And since the material is in our area, it should be removed to within our area. I suggest removal to an abandoned coal mine, which Bellingham has many.

Sincerely,

Morgan Brunstrom

(6)

Adams, Mark (ECY)

From: Arthur Mohr [art.mohr@genpointllc.com]
Sent: Tuesday, August 27, 2013 1:59 PM
To: Adams, Mark (ECY)
Cc: briang@portofbellingham.com; Terpening, Dustin (ECY)
Subject: Cornwall Avenue Landfill

Hello Mark,

I just read online about the proposed cleanup of the Cornwall Avenue landfill and wanted to offer an alternative design that may provide better environmental protection than the proposed sand/wood waste cap.

I represent a company named LiteEarth – manufacturers of a synthetic grass liner used for environmental closure applications. Consider the following...

Synthetic grass closures systems are problem solvers - helping to reduce the cost of closure (especially for soil depleted sites), while successfully addressing odors, slope failures, erosion and other issues associated with traditional closures. In addition, synthetic turf closure systems generate predictable and clean stormwater runoff, provide easy visual inspection of the cover system and greatly reduce the cost of maintenance as compared to traditional closure systems.

LiteEarth features include...

- **Natural aesthetics:** Aesthetically pleasing synthetic grass that resembles authentic vegetation with an advanced monofilament yarn technology that provides excellent UV stability and exceptional color stability through the life of the product. The yarn is tufted and bonded in place thereby remaining stable throughout its life
- **Durable Liner that Provides Long-Term Environmental Protection:** An advanced two-ply synthetic grass/EPDM geomembrane liner that provides an excellent permeability performance, puncture resistance, tear strength, thermal stability and long-term performance. Extremely durable – you can drive on the cover after installation - and it is easy to repair. The system is meets Federal EPA and state performance standards for final closure.
- **Mechanical Anchors Secure for Wind-Uplift:** Mechanical anchors are used to secure the cover - the system does not require sand infill for ballast. Anchor trenches may be used along the periphery to secure the system
- **Confidence for the Long-Term:** The system is warranted to 30 years - manufactured and sold by one of the largest turf companies in the world (www.actglobalsports.com). In fact, the President of ACT Global Sports, John Baize, is the Chairman of the Synthetic Turf Council (http://www.syntheticturfcouncil.org/)
- **Summary:** The LiteEarth synthetic grass environmental liner is a triple win - superior technology / lower installation cost / lower operation and maintenance cost

More information concerning the system can be viewed on our website at www.liteearth.com,

Perhaps one of the most important performance benefits of our system is that provides CLEAN water runoff without silt and without the risk of erosion and/or slope failures that could result from a natural cap. I noticed that this landfill is located on the waterfront, making slope failures and silt runoff problematic. I would also reiterate that we can design a naturally looking synthetic grass that will resemble that of the natural environment.

I would encourage that our system be considered in your technical evaluations for closing the site. If interested, we would be very happy to meet with you and your team directly, or conduct a webinar, to present our technology and its potential benefits for your site.

Thank you.

(6)

Regards,

Art

Arthur W Mohr Jr
Genpoint Associates
248/835-0386
Email: art.mohr@genpointllc.com
Website: www.genpointllc.com

Genpoint Associates is an independent sales agency for leading products and solutions

LiteEarth

Adams, Mark (ECY)

From: Arthur Mohr [art.mohr@genpointllc.com]
Sent: Thursday, August 29, 2013 1:13 PM
To: Adams, Mark (ECY)
Cc: Terpening, Dustin (ECY); Gouran, Brian; Chuck Fleishman
Subject: Re: Cornwall Avenue Landfill

Thank you, Mark. Look forward to hearing more on the 20th. Yes, I would agree that our system would best be evaluated during the engineering phase and hope we have the opportunity to talk more then.

One final point I'd like to mention... our product can be designed to have a natural transition to an athletic field or other common area in order to repurpose the site. This would provide additional value and long-term community benefit. You'll note that our highly engineered synthetic grass systems are also featured in professional sports fields, landscaping and airport applications and will provide years of aesthetic and functional performance

Thanks for the consideration.

Regards,

Art

Arthur W Mohr Jr
GenPoint LLC
248/835-0386
art.mohr@genpointllc.com

On Aug 29, 2013, at 12:06 PM, "Adams, Mark (ECY)" <MADA461@ecy.wa.gov> wrote:

Mr. Mohr:

Thank you for your suggestion. I will be responding "officially" once the comment period closes on September 20th. In the meantime I wanted to let you know that considering a synthetic grass liner will probably me more appropriate at the engineering design stage of the project. It may be that this type of liner could have some applicability as part of the proposed park development.

Thank you again.
Sincerely,

Mark Adams, LHG
Site Manager, Toxics Cleanup Program
---
ph (425) 649-7107
mark.adams@ecy.wa.gov

Department of Ecology, Northwest Regional Office
3190 160th Ave SE, Bellevue, Washington 98008

From: Arthur Mohr [mailto:art.mohr@genpointllc.com]
Sent: Tuesday, August 27, 2013 1:59 PM

8

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Thank you.

Regards,

Art

Arthur W Mohr Jr
Genpoint Associates
248/835-0386
Email: art.mohr@genpointllc.com
Website: www.genpointllc.com

Genpoint Associates is an independent sales agency for leading products and solutions

<image001.png>

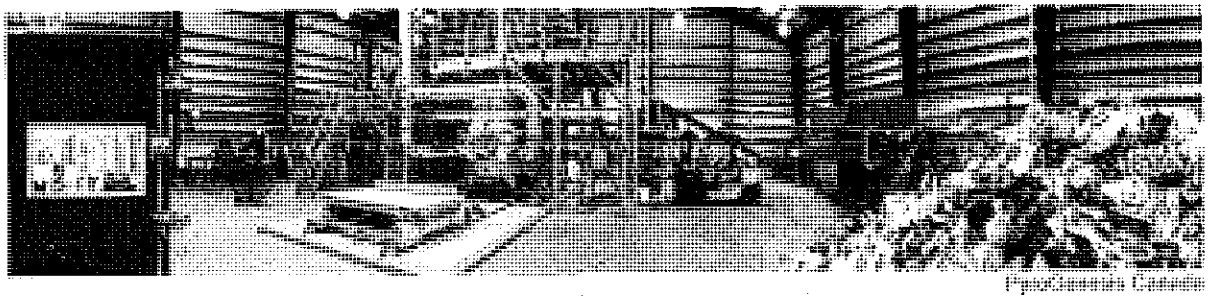
Adams, Mark (ECY)

From: lynne & bob [bmort@nas.com]
Sent: Wednesday, September 04, 2013 12:07 PM
To: Adams, Mark (ECY)
Subject: plasma gasification

Thank you for your call. I will try to put some more stuff together tonight. Here are a few things to get started.

www.science.howstuffworks.com/environmental/energy/plasma-converter
www.nytimes.com/2012/09/11/science/plasma-gasification-raises-hopes-of-clean-energy-from-garbage

Plasma Gasification Raises Hopes of Clean Energy From Garbage



GARBAGE IN, ENERGY OUT A plasma arc gasification system at the Hurlburt Field Air Force base in Florida processes 10 tons of garbage a day, making enough energy to sustain the system.

By RANDY LEONARD
Published: September 11, 2012

David Robau tours the country promoting a system that sounds too good to be true: It devours municipal garbage, recycles metals, blasts toxic contaminants and produces electricity and usable byproducts — all with drastic reductions in emissions.

Mr. Robau, an environmental scientist for the Air Force, has been promoting a method that was developed with the Air Force to dispose of garbage with neither the harmful byproducts of conventional incineration nor the environmental impact of

transporting and burying waste. It is one of several innovative techniques that the United States military has been researching to provide alternatives to the open-pit burns that some veterans of the Iraq and Afghanistan wars say have made them ill.

Already some waste companies and cities like New York have shown an interest in technology similar to what Mr. Robau has been promoting, known as plasma arc gasification. Proponents say the process can break chemical bonds and destroy medical waste, PCBs (polychlorinated biphenyls), asbestos and hydrocarbons, some of which can be hazardous if disposed of in landfills or traditional mass-burn incinerators.

Still, some environmentalists are leery. They say the ability to fully dispose of waste will discourage recycling and the development of renewable products, and the gasification will still result in toxic substances like dioxins.

Mr. Robau maintains that the process is earth-friendly. "This is not incineration," he said. "This is gasification, so it's a lot cleaner, a lot better for the environment."

Mr. Robau, who also heads a nonprofit organization based in Gulf Breeze, Fla., has overseen testing of the small-scale plasma arc gasification system, which cracks complex molecules into simple elements using energy as intense as the sun's surface, making fuel for about 350 kilowatts of electricity from about 10 tons of garbage each day, enough to run the system.

The system has been hard at work in a 6,400-square-foot building at Hurlburt Field Air Force base in Florida's panhandle. A mechanical shredder cuts household garbage into pieces no bigger than two inches. An airtight auger feeds the waste into an oxygen-poor gasification chamber, where temperatures reach more than 9,000 degrees.

In an instant, wood disintegrates, plastics turn to gas. Bits of metal and glass fall into a molten pool.

From two graphite electrodes, an arc of electricity leaps about a foot to the molten slag, producing a cloud of ionized particles known as plasma, which

heats the chamber. Most heavier metals settle to the bottom of the pool, below a layer of liquid silica and other oxides. The metals are removed, cooled and used for steel or other products.

"Effectively, 100 percent of all the metals on the base are being recycled," Mr. Robau said.

The liquid oxides are removed and form a glassy solid when cooled. The slag traps contaminants like errant lead molecules and other heavy metals in a vitreous matrix that takes up 1 percent of the volume of the original waste, Mr. Robau said, a tenth of the volume left over after traditional incineration.

The vitrified component meets standards for disposal and may even be suitable for use as a construction aggregate, according to Mr. Robau and other industry professionals.

In the chamber, organic gases break down into hydrogen and carbon monoxide — the components of a fuel called synthesis gas, or syngas — which exits the furnace.

The gas passes through a plasma torch polisher, which breaks down remaining complex molecules and soot.

Injected water cools the syngas to less than 200 degrees. The extreme temperature of the plasma followed by quick cooling inhibits the formation of dioxins and furans (another organic compound), according to Mr. Robau and other industry experts.

The lack of dioxin creation would be a benefit over traditional incinerators and other types of gasifiers, in which lower temperatures and incomplete burning result in toxic compounds.

Emissions rules forced a 99 percent cut in dioxin and furan emissions and a 96 percent reduction in mercury from traditional incinerators between 1990 and 2005, according to the Environmental Protection Agency. However, companies have to dispose of the toxic ash filtered from mass-burn facilities.

After water quenches the gas in the Hurlburt system, stripping processes produce sodium bisulfate and hydrochloric acid, which can be sold, Mr. Robau said.

The gas passes through three types of filters to catch remaining impurities. The resulting syngas is as clean or cleaner than natural gas, and the system produces less than half the nitrogen oxides and 5 percent of the sulfur oxides and mercury of a traditional incinerator, Mr. Robau said. The Air Force uses the syngas to produce enough electricity to power the system.

Companies have used plasma arc technology in steel refining for more than a century. Some small-scale plasma gasifiers are specialized to process materials like asbestos or medical waste.

In Japan, a plasma facility originally designed to zap residue from automobile shredding now handles up to 150 tons of municipal solid waste each day in the city of Utashinai. And construction on a plant of similar size, designed to process industrial waste and wood chips, wrapped up this summer in Morcenx, in southern France.

Companies have been eying plasma gasification of municipal waste with eager hopes, but until recently financing has lagged. Plasma facilities are expensive, and the energy-hungry arcs and torches can consume half of the generated electricity. On the other hand, the systems can also handle medical and hazardous waste, which can command two to four times the fees associated with municipal waste.

"The problem has been over the years trying to find that economic sweet spot," said Joe Vaillancourt, who evaluates newer technologies for Waste Management, a $15.4 billion company with headquarters in Texas.

In the past five years, with increased interest in energy independence and sustainability, venture capitalists and companies have financed testing of small-scale systems, including a 25-ton system built and run by InEnTec in Arlington, Ore., Mr. Vaillancourt said. Waste Management now holds an equity stake in InEnTec.

Last month the Agriculture Department announced a conditional $105 million loan guarantee for Fulcrum BioEnergy to build a much larger system outside Reno, Nev. It will use three InEnTec plasma melters to process 400 tons of garbage a day, an unprecedented scale for a plasma municipal waste facility, said Mr. Vaillancourt and others in the industry. Fulcrum plans to create ethanol from the syngas, and expects the Reno plant to be running in 2014.

New York City, too, is looking for innovative technology to deal with some of the city's waste. In March, the Bloomberg administration requested proposals to build a facility that would use newer techniques like plasma gasification or anaerobic digestion to process as much as 900 tons of garbage a day.

"New Yorkers want their trash to be handled in an environmentally friendly way," said Caswell F. Holloway, deputy mayor for operations. "Anything would be better than putting it in the ground." The city is reviewing the proposals.

Still, some environmental groups, like the Sierra Club and the Global Alliance for Incinerator Alternatives, lump these techniques in with traditional incinerators, claiming that they still produce dioxin. They also oppose renewable energy credits for these facilities.

Allen Hershkowitz, a scientist with the Natural Resources Defense Council, said he believed there was a place for waste-to-energy operations, but only after recycling and composting programs had been maximized.

He said he still believed that communities could reach recycling rates of 60 to 70 percent. In his view it is premature for a city like New York, with a recycling rate of about 15 percent, to be considering setting up a new waste facility. "They're not even at the point where they should be thinking about waste-to-energy," Mr. Hershkowitz said.

This article has been revised to reflect the following correction:

Correction: September 12, 2012

An article on Tuesday about the plasma arc gasification method of waste disposal misstated part of the name of the organization with which Allen Hershkowitz, a scientist

who said he believed that New York City's low recycling rate makes its interest in waste-to-energy technology premature, is affiliated. Mr. Hershkowitz is with the Natural Resources Defense Council, not the National Resources Defense Council.

A version of this article appeared in print on September 11, 2012, on page D3 of the New York edition with the headline: Plasma Gasification Raises Hopes of Clean Energy From Garbage.

Adams, Mark (ECY)

From: lynne & bob [bmort@nas.com]
Sent: Wednesday, September 04, 2013 12:10 PM
To: Adams, Mark (ECY)
Subject: Fw: Plasma gasification

Here is another. Thanks again for your interest, bob
----- Original Message -----
From: lynne & bob
To: Eric McRory ; Donnie
Sent: Wednesday, September 04, 2013 10:10 AM
Subject: Plasma gasification

Check out this web page for info on plasma gasification. www.thesciencecouncil.com/louis-j-circeo/70-top-10-facts-about-the-plasma-gasification-of-municipalwaste bob

98

Top 10 Facts about the Plasma Gasification of Municipal Solid Wastes

Discovery Channel Online, December, 2008

The scoop: Plasma is a collection of charged particles that respond to an electromagnetic field (think lightning and the sun). In Florida and California, cities are looking at ways to use plasma to obliterate garbage and use the heat to generate power. But initial plans in Florida to build the largest plasma arc gasification plant in the world have been scaled back by about 80 percent. And in Sacramento, the proposed plant has been put on hold because of a lack of details about just how much electricity would be produced and how much trash would be gasified by plasma. But why were folks looking into plasma in the first place? Expert Louis Circeo gives a list of his top 10 reasons for zapping garbage with plasma.

1. It reduces the need for landfills.
Sometimes called "artificial lightning," plasma can have temperatures that can exceed 7,000 degrees centigrade -- that's three times hotter than fossil fuels and hotter than the surface of the sun.

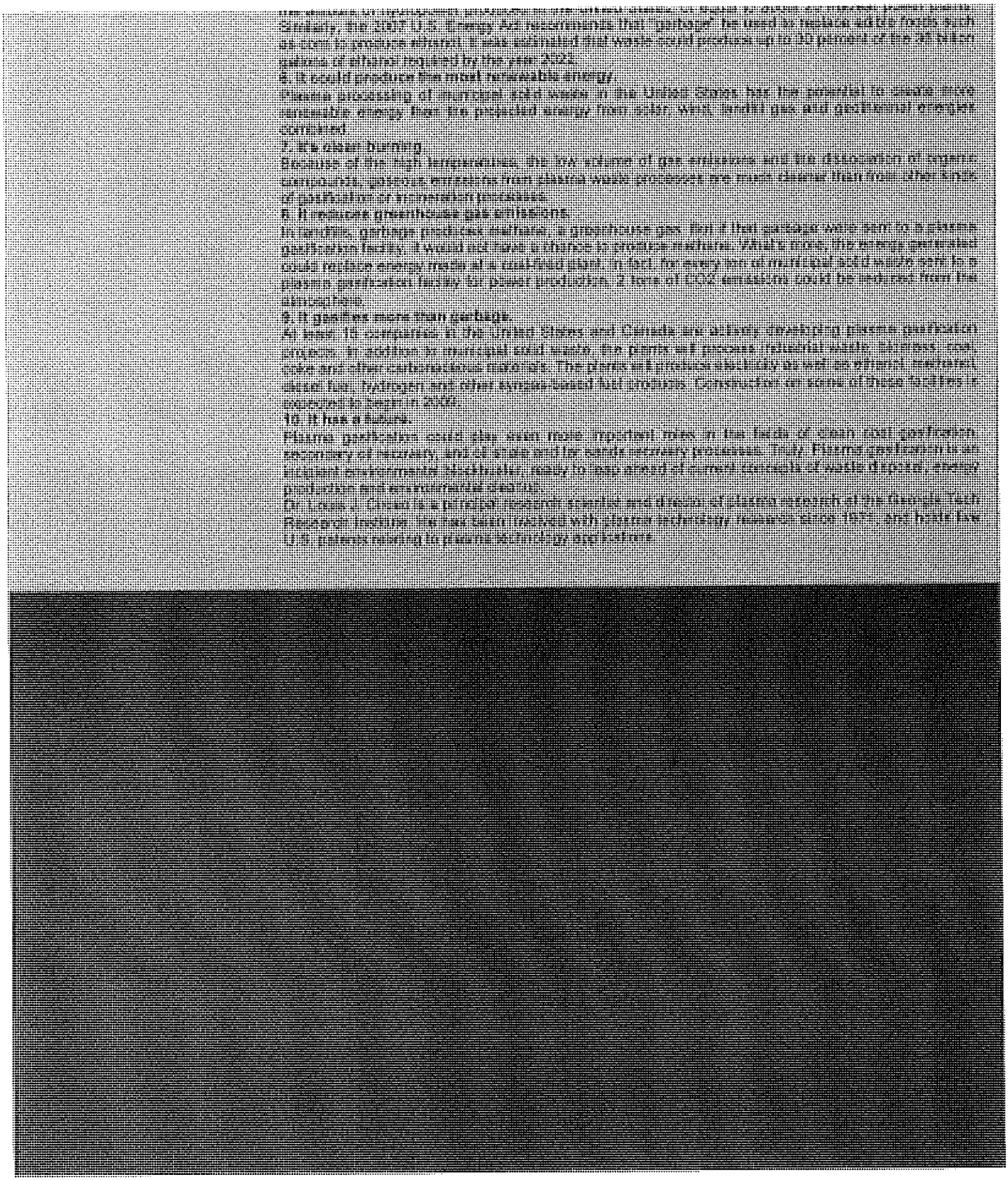
The plasma arc would instantly convert organic materials into synthetic gas, often called "syngas," and melt inorganic materials, which when cooled, become rock like and can be sold as construction materials. With no remaining waste to deal with, landfills become obsolete.

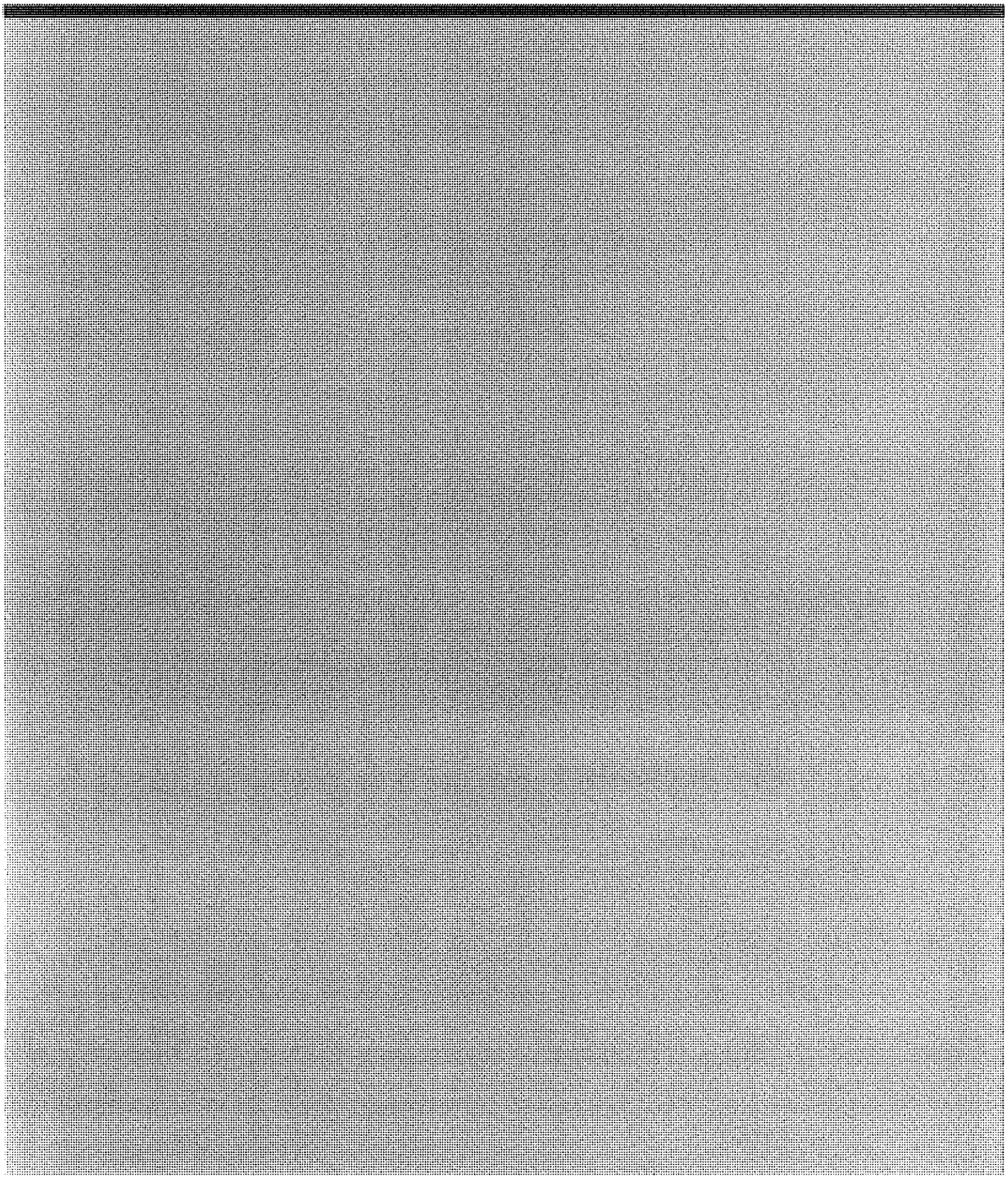
2. Existing landfills could be mined for energy.
In many regions of the United States, it would be more cost effective to take municipal solid waste to a plasma gasification plant for energy production than to dump it in a landfill. When plasma gasification is fully developed, even existing landfills could be economically mined for energy production, environmental cleanup and land reuse.

3. It's energy efficient.
Plasma gasification of 1 ton of average municipal solid wastes would send about 816 kilowatt-hours of electricity to the grid. This is 20 to 50 percent more electricity to the grid than any other emerging thermal waste-to-energy technology. In addition, this amount of power is over six times the electricity required to conduct the plasma gasification process.

4. It's working in other countries.
Since 2002, two commercial waste-to-energy plasma gasification plants have been operating successfully in Japan. The Mihama-Mikata facility processes 24 tons of municipal solid waste and 4 tons of sewage sludge per day, producing steam and hot water for local use. The Utashinai plant processes up to 300 tons per day of waste and/or automobile shredder residue. This facility produces up to 7.8 Megawatts of electricity, of which 3.6 MW are used to run the plasma torches and the plant, and up to 4.3 MW are sent to the electrical power grid. In Ottawa, Canada, people are evaluating a demonstration facility that is currently processing 94 tons of waste per day, sending 4 MW of power to the grid.

5. It could produce ethanol fuel.
If all the municipal solid waste in the United States was processed by plasma gasification, over 5 percent of the U.S. electrical energy requirements could be produced. This amount of power is equal to the amount of hydropower produced in the United States, or equal to about 25 nuclear power plants. Similarly, the 2007 U.S. Energy Act recommends that "garbage" be used to replace edible foods such as corn to produce ethanol. It was estimated that waste could produce up to 30 percent of the 36 billion gallons of ethanol required by the year 2022.





Top 10 Facts about the Plasma Gasification of Municipal Solid Wastes/*
********** drop down menu Java script code - start **********/ // don◆t need this line if using .JS file /* ********* drop down menu Java script code ◆ end **********/ HomeAbout UsStaffContact UsSpeakers AvailableYou Can Help!DonateNewsletterLinksThe NumbersLatest NewsAlternative Energy ProductionConferencesSCGI Members Dr. James Hansen
Dr. Evgeny Velikhov
Tom Blees, President
Dr. Yoon Chang
Steve Kirsch, MIT S.M.
Dr. George S. Stanford
Joe Shuster
Dr. Barry Brook
Dr. Dan Meneley
Dr. Louis J. Circeo
Dr. Charles Till
Dr. Eugene Preston
Dr. Ray Hunter
Dr. Baldev Raj
Dr. William Hannum
Leonard J. Koch
Dr. Jeff Eerkens
Bruno Comby
Dr. Charles B. Archambeau
Dr. John Sackett
Graham R.L. Cowan
Board of Directors
Guest Contributors David MacKay
Home Dr. Louis J. Circeo Top 10 Facts about the Plasma Gasification of Municipal Solid Wastes Top 10 Facts about the Plasma Gasification of Municipal Solid Wastes

Discovery Channel Online; December, 2008

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6. It could produce the most renewable energy.

Plasma processing of municipal solid waste in the United States has the potential to create more renewable energy than the projected energy from solar, wind, landfill gas and geothermal energies combined.

7. It's clean burning.

Because of the high temperatures, the low volume of gas emissions and the dissociation of organic compounds, gaseous emissions from plasma waste processes are much cleaner than from other kinds of gasification or incineration processes.

8. It reduces greenhouse gas emissions.

In landfills, garbage produces methane, a greenhouse gas. But if that garbage were sent to a plasma gasification facility, it would not have a chance to produce methane. What's more, the energy generated could replace energy made at a coal-fired plant. In fact, for every ton of municipal solid waste sent to a plasma gasification facility for power production, 2 tons of CO2 emissions could be reduced from the atmosphere.

9. It gasifies more than garbage.

At least 15 companies in the United States and Canada are actively developing plasma gasification projects. In addition to municipal solid waste, the plants will process industrial waste, biomass, coal, coke and other carbonaceous materials. The plants will produce electricity as well as ethanol, methanol, diesel fuel, hydrogen and other syngas-based fuel products. Construction on some of these facilities is expected to begin in 2009.

10. It has a future.

Plasma gasification could play even more important roles in the fields of clean coal gasification, secondary oil recovery, and oil shale and tar sands recovery processes. Truly. Plasma gasification is an incipient environmental blockbuster, ready to leap ahead of current concepts of waste disposal, energy production and environmental cleanup.

Dr. Louis J. Circeo is a principal research scientist and director of plasma research at the Georgia Tech Research Institute. He has been involved with plasma technology research since 1971, and holds five U.S. patents relating to plasma technology applications.

Search

Louis J. Circeo

Dr. Louis J. Circeo is a Principal Research Scientist and the Director of Plasma Research in the Electro-Optical Systems Laboratory, Georgia Tech Research Institute(GTRI) at the Georgia Institute of Technology. He holds a Ph.D. in Civil Engineering with Nuclear Engineering Minors from Iowa State University. He has extensive research and development experience relating to construction and environmental engineering, and is a registered professional engineer. Dr. Circeo began his career with the Plowshare Program at the Lawrence Livermore National

Laboratory conducting research into the peaceful industrial uses of nuclear explosions. He has been involved with plasma arc technology research since 1971, and holds five U.S. patents relating to plasma technology applications. He established the plasma applications research program at Georgia Tech in 1990, and is now conducting an active research program principally directed toward engineering and environmental applications of plasma arc technology for the treatment and energy recovery of municipal and hazardous/toxic wastes. Related interests include the subterranean plasma remediation of contaminated soils, municipal landfills, and buried hazardous /toxic debris deposits; and the subterranean vitrification and stabilization of weak foundation soils and unstable landslide-prone regions.

In the future, Dr. Circeo believes that plasma arc technology is poised to create groundbreaking innovations in the fields of liquid fuels production, coal gasification and oil, oil shale and tar sands recovery processes.

Adams, Mark (ECY)

From: Judith Akins [sunsetjam@gmail.com]
Sent: Friday, September 06, 2013 8:20 AM
To: Adams, Mark (ECY)
Subject: Cleanup Bellingham Waterfront

The hazardous substances under the white tarps on Bellingham Bay cannot be covered over and made into a park. There are dioxins which are harmful to human health in the groundwater, soil and sediment. You are well aware of this and it cannot be left on our waterfront to sicken our children for generations to come. Unfortunately you know as well that there are hundreds of other places in our country that the same coverups have been allowed . This is irresponsible and we cannot allow this sludge to remain on our land next to the bay which it will surely leach. I don't clean my house by covering it with a tarp! Whatever the cost it must be removed.

Judith Akins
2174 E Birch St
Bellingham, WA 98229
360-982-8599

Sent from my iPhone

(1D)

Adams, Mark (ECY)

From: Lee First [leef@re-sources.org]
Sent: Tuesday, September 10, 2013 3:52 PM
To: Adams, Mark (ECY)
Subject: questions about the proposed landfill liner

Hi Mark,

I would like to know what the "20ml scrim reinforced" liner is made out of. Is it HDPE, PVC, CPE, CSPE, or ??

thanks,

--
Lee First
Pollution Prevention Specialist, North Sound Baykeeper Team
RE Sources for Sustainable Communities
(360) 733 8307
www.re-sources.org

14

Adams, Mark (ECY)

From: Jeremy Freimund [JeremyF@lummi-nsn.gov]
Sent: Friday, September 13, 2013 11:34 AM
To: Bellon, Maia (ECY); Timothy J. Ballew II; Elden Hillaire; GOLDMARK, PETER (DNR); 'Perry, Randel J NWS'; Allen, Douglas R. (ECY); Adams, Mark (ECY); Kelli Linville (klinville@cob.org); Fix, Rob; 'ccmail@cob.org'; 'dianem@portofbellingham.com'
Cc: Merle Jefferson Sr.; Leroy Deardorff; Diana R. Bob; Alan Chapman; Randy Kinley Sr.; mikes@portofbellingham.com; Lena A. Tso; Leonard D. Dixon; 'DARRELL PHARE'
Subject: Lummi Nation Comments on the Draft Cornwall Avenue Landfill Clean-Up Site RI/FS
Attachments: LummiNationCommentsRI-FS_CornwallAvenueLandfill092013.pdf

Hi All,
I hope that you are doing well. Merle Jefferson directed me to send you the attached letter that provides the Lummi Natural Resources Department comments on the Draft Cornwall Avenue Landfill Clean-Up Site Remedial Investigation and Feasibility Study.
Kind Regards,
Jeremy

Please note new address and telephone number, effective May 29, 2013

Jeremy R. Freimund, P.H.
Water Resources Manager
Lummi Natural Resources Department
2665 Kwina Road
Bellingham, WA 98226
(O) 360-312-2314
(C) 360-410-1775
http://lnnr.lummi-nsn.gov/LummiWebsite/

(13)

LUMMI INDIAN BUSINESS COUNCIL
2665 KWINA ROAD BELLINGHAM, WASHINGTON 98226 (360) 312-2000

September 13, 2013

Ms. Maia Bellon, Director
Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

SUBJECT: **Comments on the Draft Cornwall Avenue Landfill Clean-Up Site (Facility Site ID No. 2913) Bellingham, Washington Remedial Investigation and Feasibility Study**

Dear Ms. Bellon,

The purpose of this letter is to provide comments from the Lummi Natural Resources Department on the public review draft remedial investigation and feasibility study (RI/FS) for the Cornwall Avenue Landfill Clean-Up Site (Facility ID No. 2913). The Lummi Cultural Resources Department may be submitting comments on the RI/FS under a separate cover.

The Lummi Nation has a basic and fundamental concern with the RI/FS and its associated preferred clean-up option that is highlighted by a gap in the site history presented in the fact sheet for the proposed action. Although the text of the RI/FS accurately states that historically the majority of the site consisted of tide flats and subtidal areas, the project fact sheet (the only document about this proposed action that is generally read by the public and the basis for public comments) indicates that the site history began in 1888 with the site being used for sawmill operations including log storage and wood disposal. The site was then used by the City of Bellingham as a municipal waste landfill from 1953 to 1965. The omission of the historic use of this site is factually incorrect, misleading, and a poor substitution for reality. If factually accurate, the site history section of the fact sheet would begin with time immemorial and would have identified the use of the site by Lummi Indians for commercial, ceremonial, and subsistence harvest of salmon and shellfish and to provide habitat for the organisms relied on for this purpose. This traditional use and value of the site, which is protected by a Treaty with the United States, was curtailed without permission, compensation, mitigation, or apology by first dumping wood waste on this important habitat and fishing area and then dumping the garbage of the citizens of Bellingham on lands that we rely to exercise our Schelangen ("way of life").

This filling and destruction of habitat and fishing areas that our people rely on with the garbage of our neighbors is highly insulting. Now, the liable parties are seeking to compound these insults with a RI/FS conclusion that removal of the contaminated soil and garbage would be too expensive even though the RI/FS also concludes that removal would:

1. Provide the highest level of protection of human health and the environment of all of the alternatives consider;
2. Be the most permanent of the alternatives considered;
3. Have the highest certainty of long-term effectiveness of the alternatives considered; and
4. Have the highest net environmental benefit based on the amount of aquatic habitat improved and created.

The Lummi Nation has additional concerns with the analysis that was undertaken in the feasibility study. A Disproportionate Cost Analysis that considered only the clean-up costs to the potentially liable parties (Port of Bellingham, City of Bellingham, and the Washington State Department of Natural Resources) was used to eliminate the removal alternative from further consideration. This resulted in an artificial narrowing of the potential solutions to the waste and contamination. If the Disproportionate Cost Analysis considered the costs to the environment, the costs to the Lummi Nation, environmental justice, cumulative effects, and other non-market goods and services over the last 125 years that have already been incurred as a result of the dumping activity at this site, a different conclusion may have been reached. The approach taken in evaluating the clean-up alternatives essentially ignores the disproportionate cost to the Lummi Nation associated with land use activities that destroyed land relied on since time immemorial to support the exercise of treaty protected rights. Ignoring the disproportionate cost already incurred by the Lummi Nation (and the environment overall) allows the City of Bellingham to essentially "pocket" all of the cost-savings that it has already realized by dumping garbage into our fishing areas rather than shipping its municipal solid waste to an appropriate upland location.

The Lummi Nation is the primary natural resource manager in the Bellingham area. 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. The Lummi Nation is a federally recognized Indian tribe and the Lummi Indian Business Council (LIBC) is the duly constituted governing body of the Lummi Indian Reservation by the authority of the Constitution and By-laws of the Lummi Nation of the Lummi Reservation, Washington. The Lummi Indian Business Council and the Lummi Natural Resources Department regularly works with Ecology and other state agencies to address concerns regarding our shared resources. What were formerly highly productive tide flats and subtidal areas that performed important ecological functions and that were fished by the Lummi People, now called the Cornwall Avenue Landfill Site, is located within our adjudicated usual and accustomed grounds and stations. As the site remediation is currently contemplated, there is little benefit or resolution to the impacts imposed on the Lummi Nation.

The Lummi Nation is a fishing tribe and has used the waters and shorelines of Bellingham Bay since time immemorial. 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, ceremonial and subsistence purposes. Although the Lummi Nation still fishes the waters of Bellingham Bay, the resources and the habitat that is required to support a sustainable harvestable surplus have been degraded by human activities and shoreline development, which have limited or 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, the Aerated Stabilization Basin (ASB), and the Cornwall Avenue Landfill. In addition to these actions, which have physically precluded the exercise of tribal treaty rights in these areas and eliminated key habitat needed to sustain salmon and shellfish, the Whatcom Waterway, the ASB, the Cornwall Avenue Landfill 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 and the essentially unregulated dumping of municipal waste.

Consistent with LIBC Resolution 92-126, the Lummi Nation's position is that it is time for the Washington Department of Ecology (Ecology) to take corrective actions for these past transgressions and to prevent any further impacts to tribal resources. Resolution 92-126 resolves that, "The policy of the Lummi Nation is to ensure no further loss of the resource base or of environmental quality, and to restore and enhance damaged areas within the Lummi homeland and territories." Accordingly, our position is that Ecology should take the following actions:

1. Consider the impacts and costs over the last 125 years (adjusted for inflation) of the dumping of wood waste and municipal solid waste on the people who relied on the former tidelands and subtidal areas for commercial, ceremonial and subsistence

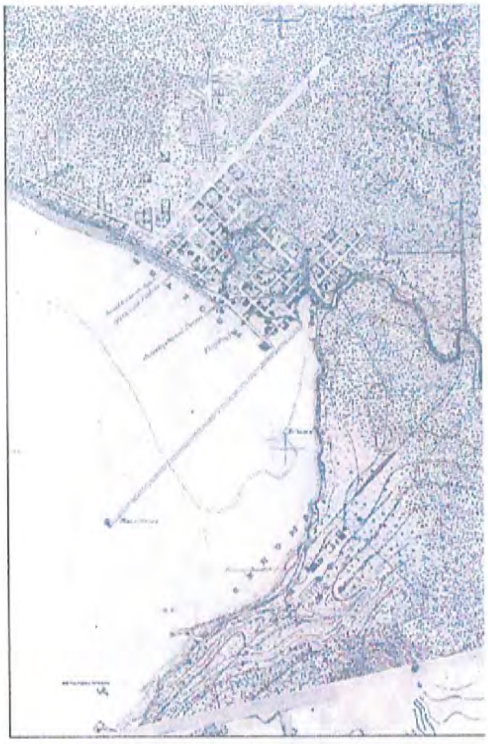
purposes – not just the clean-up costs for the potentially liable parties who have already benefited from the destruction of resources relied on by the Lummi Nation.

2. Despite the higher costs, require the potentially liable parties to implement Alternative 4 (i.e., remove the contaminated soil and garbage and restore approximately 7 acres of tidal and subtidal habitat and fishing areas).

Sincerely,

Merle Jefferson, Executive Director
Lummi Natural Resources Department

cc Timothy Ballew II, LIBC Chairman
Elden Hillaire, Natural Resources Commission Chair
Commissioner Peter Goldmark, Washington Department of Natural Resources
Randel Perry, U.S. Army Corps of Engineers
Mark Adams, Department of Ecology
Doug Allen, Department of Ecology
Mayor Kelli Linville, City of Bellingham
Robert Fix, Port of Bellingham Executive Director
Bellingham City Council
Port of Bellingham Commission



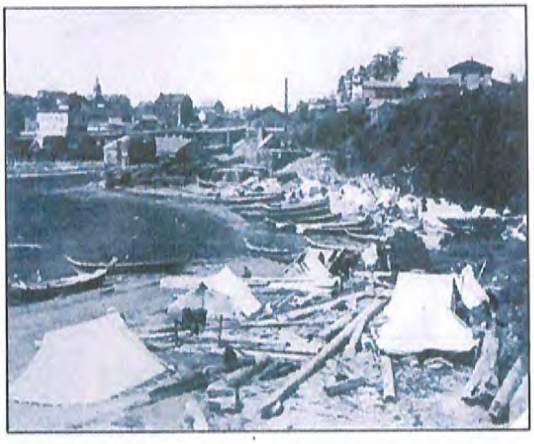
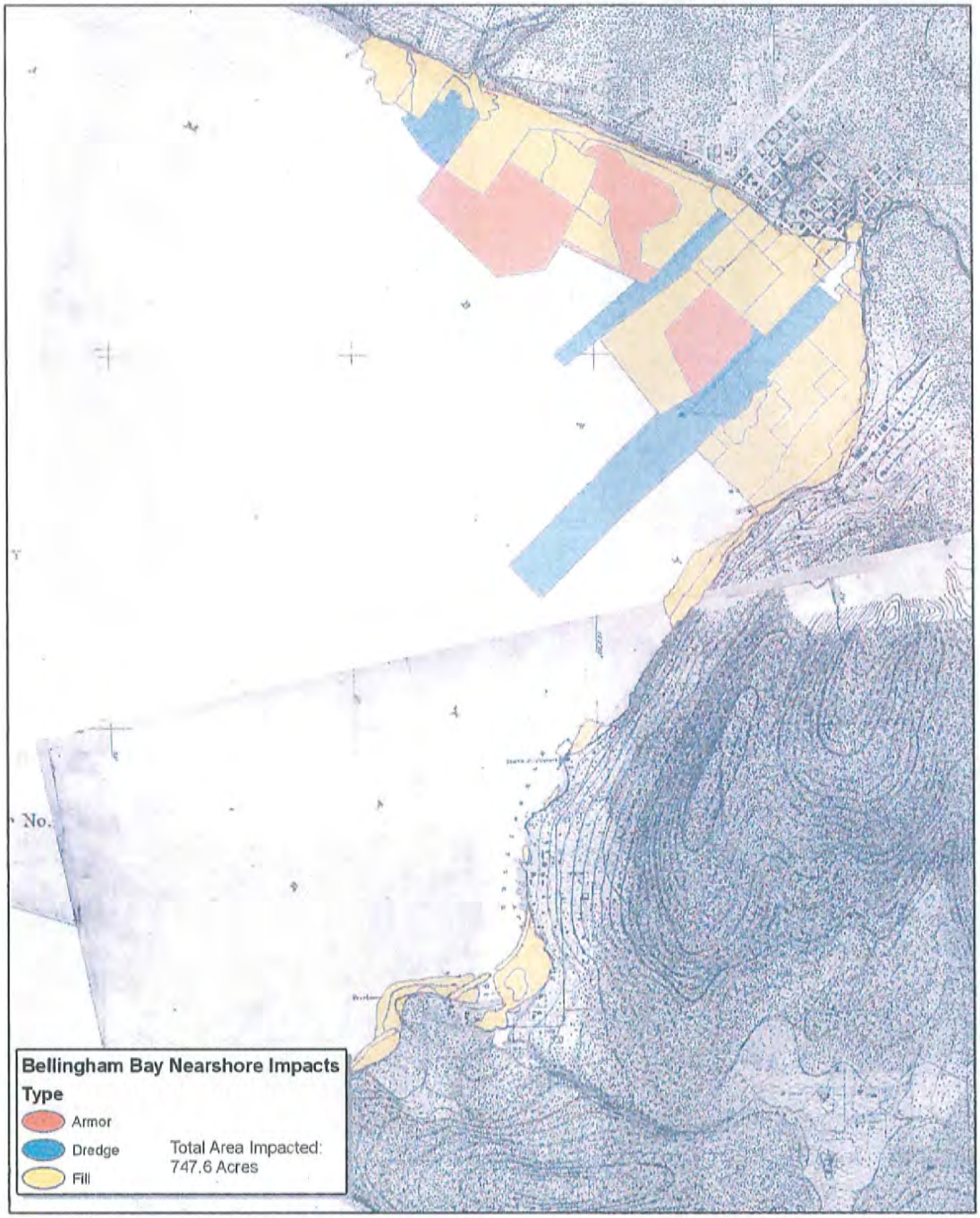


Figure 1. Bellingham Bay Nearshore Impacts



Bellingham Bay Nearshore Impacts

Figure 2. Bellingham Bay Nearshore Impacts

Adams, Mark (ECY)

From: Wendy Steffensen [wendys@re-sources.org]
Sent: Friday, September 13, 2013 5:16 PM
To: Gouran, Brian
Cc: Adams, Mark (ECY)
Subject: Re: miscellaneous questions on units, etc for Cornwall RIFS

OK another one...

I am looking at Appendix E2.

Do you have a map showing where these sediment coring stations are?
Wendy

On Fri, Sep 13, 2013 at 4:59 PM, Gouran, Brian <BrianG@portofbellingham.com> wrote:

Hi Wendy,

Good catch on the units on Figure 6-1. The thickness represented in that figure are in feet. The narrative describing the information presented in that figure is in Section 6.2.1.

Regarding the page 6-19 bullets, that is referring to accumulation of sediment impacted with woodwaste in thickness, not aerial extent, so square feet would not apply. All of the bullets combined would indicate that any point with any detectable refuse, or an accumulated thickness of more than one-foot of sediment where wood debris makes up >50% of the sediment (in cross-section) and less than one-foot of clean sediment over the refuse or woodwaste represents an "exceedence".

I only have the e-mail communication that we provided to your intern yesterday so I may have to work with Ecology and Landau on the reference/citation for how exactly these were developed and get back to you.

Enjoy the weekend.

Brian

From: Wendy Steffensen [mailto:wendys@re-sources.org]
Sent: Friday, September 13, 2013 4:17 PM
To: Gouran, Brian
Subject: miscellaneous questions on units, etc for Cornwall RIFS

(18)

Figure 6-1: What are the depth units supposed to be?

On p 6-19, the refuse and wood criteria are confusing. Should the 1 ft accumulation in bullet 1 be 1 sq ft? And the Kovacs reference does not actually provide any rationale for these numbers. Do you have a citation you can forward to me for the rationale?

Thanks!

Wendy

--

Wendy Steffensen, Lead Scientist

North Sound Baykeeper Team
RE Sources for Sustainable Communities
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Bellingham, WA 98225

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--

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Adams, Mark (ECY)

From: Wendy Steffensen [wendys@re-sources.org]
Sent: Friday, September 13, 2013 6:42 PM
To: Gouran, Brian
Cc: Adams, Mark (ECY)
Subject: low conductivity for dioxin cap material- Cornwall

I am finding the hydraulic conductivity number, but not the actual document that shows how it was obtained. I thought I has seen previously- can you point me in the right direction?
Wendy
--
Wendy Steffensen, Lead Scientist
North Sound Baykeeper Team
RE Sources for Sustainable Communities
2309 Meridian St.
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360 739-5518 (cell)

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Adams, Mark (ECY)

From: Hank Kastner [henrykastner@gmail.com]
Sent: Saturday, September 14, 2013 6:04 AM
To: Adams, Mark (ECY)
Subject: Cornwall Ave. Cleanup comments

Mr Adams -
I wish to express my opposition to the Cornwall cleanup plan in Ecology's latest communications.

I have followed this subject for some time. My family and I regularly enjoy park lands in the Bellingham area and I cannot imagine that this site can be made safe for the public simply by covering it up.

Further, I am very concerned that the health of our Bay as a natural ecosystem continues to be threatened by human uses. Our attempts at cleanup need to be more thorough or this valuable resource will be lost.

The problems we are faced with in a contaminated Cornwall site constitute a case study of what happens when prior generations neglect and ignore the environmental effects of their actions. We should be making extra efforts to ensure that our actions, like this cleanup effort, do not make the same mistakes at the expense of our future generations.

Thank you for your attention.

Hank Kastner
2305 Broadway
Bellingham 98225

(15)

Adams, Mark (ECY)

From: Trevor Robinson [trob1701@msn.com]
Sent: Monday, September 16, 2013 12:43 AM
To: Adams, Mark (ECY)
Subject: Cornwall Avenue Comments
Attachments: Cornwall RI_FS letter.docx

Hello-

Thank for for accepting comments regarding the draft RI/FS for the Cornwall Avenue Landfill Site. You will find my comment letter attached to this email. Please let me know if you have any questions or concerns.

Thank you very much-

Trevor Robinson

(16)

Trevor Robinson
3100 Ferry Ave Apt. D-217
Bellingham, WA 98225

Mark Adams
Site Manager
3190 160th Ave SE
Bellevue, WA 98008
via email: (mark.adams@ecy.wa.gov)

Subject: Comments on Cornwall Avenue Landfill draft environmental report

15 September 2013

Dear Mr. Adams,

Thank you for providing an opportunity to submit comments on the Cornwall Avenue Landfill Remedial Investigation and Feasibility Study (RI/FS). I would like to begin by thanking the Department of Ecology for the work that has been done on this project thus far. As a resident of Bellingham I am very interested in the results of this cleanup process, and I look forward to watching the overall waterfront redevelopment process move forward. In general I found the RI/FS to be a well-organized and thorough document that providing a good deal of information on the current environmental setting, contamination, and cleanup alternatives. However I do have a few concerns about the content of the report, which I will outline below. Again, thank you for your attention.

I: Coordination with the RG Haley site

One topic of concern is the ongoing presence of contaminants originating at the adjacent RG Haley site. Figure 6-3 (among many others) illustrates the plume of petroleum soil contamination centered at the RG Haley site and spreading south into the Cornwall Landfill area. The RI/FS report has already acknowledged the necessity of coordinating cleanup activities between the two sites, but it is worthwhile to highlight the importance of shutting down this flow of hydrocarbon pollution from RG Haley. Regardless of the cleanup alternative chosen, Ecology should formulate a method of stopping the flow of contaminants from RG Haley before any cleanup work on Cornwall is undertaken. During cleanup, regular soil and groundwater samples should be taken from the boundary between Cornwall and RG Haley to ensure that no addition petroleum contaminants have entered the Cornwall site.

Ecology should make dealing with the perennial seep located south of RG Haley (Figure 4-11) a top priority, as this seep may be a source of groundwater flow that is carrying contaminants onto the Cornwall site. In general, control of groundwater and infiltration occurring upland of the RG Haley site might be a good method of preventing mobilization of contaminants that spread into Cornwall. In short, it is not enough to simply cleanup the Cornwall site by itself; cleanup must also focus on halting the flow

of contaminants from RG Haley, and cleanup of both sites must be coordinated and timed appropriately to maximize cleanup benefits.

II: Threats to organisms and habitats

The RI/FS report should include an analysis of terrestrial plants and animals as ecological receptors. Page 5-4 of the document describes how the site is exempt from this requirement under WAC 173-340-7491(1) due to institutional controls and a future planned use that will cap or remove the contaminated soil. In spite of this exemption, there must surely be a *present* exposure potential for terrestrial plants and animals interacting with the site, and these current ecological receptors should be studied and included in the report. It is also possible that plants and animals will come into contact with contaminants during construction and cleanup operations, and this potential should also be explored in the report. Site construction workers are listed as human receptors, so there is clearly a potential for organisms to be exposed to contaminants while interacting with the site during the construction period. Plants and terrestrial animals could be exposed to contaminants in surface and subsurface soil through ingestion, dermal contact, inhalation of vapors, or contact with groundwater as a result of construction-related disturbances and activities. Please consider expanding the terrestrial plant and animal ecological receptor study to include exposure risks that could occur before the site is capped.

Concerning the Potentially Applicable State and Federal Laws listed in 9.2.2 on page 9-5, the City of Bellingham Critical Areas Ordinance (Bellingham Municipal Code Chapter 16.55) should be added to this list. The intertidal and subtidal areas within the site should qualify as fish and wildlife habitat conservation areas because they meet one or more of the criteria listed under 16.55.470.A. These aquatic areas are associated with endangered salmon (A.1), contain eelgrass beds (A.2), and are considered Waters of the State (A.6). These areas might also be associated with the pocket estuary at the mouth of Whatcom Creek (A.5). Because these marine areas meet the criteria for critical areas designation, the Bellingham CAO should be listed as a potential ARAR that will guide cleanup activities.

III: Concerns with the landfill Liners

Alternatives 1 through 3 utilize a liner that acts as a separation layer between the drainage layer and the low permeability layer. Each alternative uses a different kind of liner; Alternative 1 uses a "thin geotextile," Alternative 2 uses a 20 mil scrim reinforced polyethylene liner, and Alternative 3 uses a a 60 mil high density polyethylene (HDPE) liner. Each type of liner has a different effective lifespan, and the RI/FS report should include a discussion of how the lifespans of the liners vary and how expired liners will be dealt with in the long-term. The *Permanence* Section of 9.7.1.1 on page 9-44 (Comparative Evaluation of Alternatives: Upland Site Unit) mentions the "greater durability of the liners" used in Alternative 2 and 3 as compared with Alternative 1. While this discussion is informative, I would like to see a detailed description of the liners that includes the warrantied lifespan of each liner type. It would also be appropriate to discuss how varying lifespans of the liners affect each alternative's Effectiveness over the Long Term, not just each alternative's permanence.

If we are talking about a long-term solution to this contamination problem, it is important that the report establishes how long the components are expected to remain effective. According to available information, the 20-mil scrim-reinforced polyethylene liner used in Alternative 2 has an expected lifespan of 5 years when buried, while the 60-mil HDPE liner used in Alternative 3 is expected

to last 25-45 beneath soil cover. It is unknown how long the thin geotextile layer in Alternative 1 is expected to remain effective. The WAC requires that the cleanup represent a permanent solution to the maximum extent practicable, but the lifespans of these liners indicate that Alternatives 1-3 are not permanent without some kind of liner maintenance or replacement. If Alternatives 1, 2, or 3 are chosen, what is Ecology's plan to deal with a liner system that has outlived its effectiveness? How will Ecology monitor the site to determine the status of the liner? These are big picture questions that should not be answered after an alternative is chosen; they really should be addressed in the RI/FS.

IV: Liner, landfill cap, and land use

At several public hearings citizens have expressed concerns about how post-cleanup use of the site might affect the integrity of the landfill cap. Concerns seem to be specifically focused on puncture of the liner by roots of trees planted at parks or as urban landscaping. Overall, there is a concern that certain land uses are not compatible with a capped landfill space. The RI/FS should be expanded to address these land use concerns, including:

- Does a capped landfill impose limitations on building construction or park planning?
- Would trees require root barriers to prevent damage to the landfill liner?
- Are there any dangers associated with landfill gases and indoor air pollution (sick building syndrome, etc)?
- Are there any dangers associated with liquefaction in the event of an earthquake?

Plans for use of the waterfront redevelopment space (including the Cornwall Landfill) have not been finalized. Before the City and the Port approve redevelopment plans, it is important for the RI/FS to address how a capped landfill will impact safe building and zoning patterns. A discussion of these considerations will be informative for planners and will go a long way towards easing public concerns about reusing an old landfill space.

V: Preliminary Cleanup Levels

The Remedial Investigation develops Preliminary Cleanup Levels (PCLs) for evaluating site contamination. The public might find the use of "preliminary" cleanup levels confusing because it is not clear in the report what a PCL actually is. Ecology should either drop the word *preliminary* or somehow *finalize* these PCLs in the final RI/FS. If Ecology choses to keep *preliminary* in the report, the RI should explain what makes these cleanup levels *preliminary*, and the report should also explain how each PCL will be translated into some kind of *final* cleanup level. It might have been easier to simply create one finalized set of PCLs with the draft RI/FS. PCLs have not been consistently cited in recent RIs (they appeared in the 2006 Whatcom Waterway RI but not in the 2011 Custom Plywood RI); Ecology should either consistently use PCLs in their literature, or they should drop the term from use.

VI: Dioxin Screening Level

From my reading of Tables 5-1, 5-2, and 5-3, there is a groundwater screening level for dioxin (5-3), but not any kind of screening level for dioxins/furans in sediment or soil. Due to the toxic nature of dioxins, screening levels for dioxins/furans really should be developed for soil and sediment. This should

be done even if Ecology thinks that dioxins do not play a large role in the contamination of the site. If Ecology lacks enough information to effectively set dioxin screening levels, more soil sampling and analysis should take place.

In summary, I am asking for the following actions

- Careful coordination with the RG Haley cleanup that emphasizes groundwater management and containment of the petroleum plume
- An analysis of terrestrial plants and animals as ecological receptors, focusing exposure threats at the present and during the remediation/construction process
- Inclusion of the Bellingham CAO on the list of ARARs
- A discussion of liner lifespans and how these lifespans affect long term effectiveness of the alternatives
- An action plan to deal with an expired liner
- Text in the RI/FS that addresses how to safely build on and recreate on a capped landfill
- Change Preliminary Cleanup Levels into just Cleanup Levels. At the very least, explain what a PCL is and how it is different from a *final* cleanup level. Consider standardizing the use of PCLs in RI/FS documents.
- Create screening levels for dioxins/furans in soil and sediment.

Thank you for considering my comments. I hope that my participation in this public comment period will help lead to positive improvements to the RI/FS and a beneficial outcome to the Cornwall Landfill cleanup.

Sincerely,

Trevor Robinson

Adams, Mark (ECY)

From: Perry, Randel J NWS [Randel.J.Perry@usace.army.mil]
Sent: Monday, September 16, 2013 8:39 AM
To: Adams, Mark (ECY)
Subject: Corps comment: Cornwall Ave. Landfill cleanup site
Attachments: LummiNationCommentsRI-FS_CornwallAvenueLandfill092013.pdf

Mark:

I have received the attached comment on the Cornwall project submitted by the Lummi Tribe. Please note that our permit request review process includes consultation with affected Tribes, like the Lummi. We will have to ensure that all tribal concerns are properly addressed and that the Tribe has no objections prior to issuing a permit for the work.

Randel Perry
Army Corps of Engineers, Seattle District
Regulatory NW Field Office
(360) 734-3156 (office)
(360) 393-2867 (cell)

137

Adams, Mark (ECY)

From: ahelmrace@comcast.net
Sent: Monday, September 16, 2013 6:31 PM
To: Adams, Mark (ECY)
Subject: Cornwall Landfill site in Bellingham, Wa.

Mark,
I think that the landfill could be loaded on the empty coal train cars for a return trip to where they mine the coal. It would be a fair exchange, and the train is going there anyhow. Then the Port could turn the property into a R.V. site for the tourists to park in. We could use one for the people going to and from Alaska and just traveling thru.
Just a comment, Allen Race, Whatcom resident for 70+ years.

(19)

Adams, Mark (ECY)

From: Wendy Steffensen [wendys@re-sources.org]
Sent: Wednesday, September 18, 2013 11:26 AM
To: Adams, Mark (ECY); Gouran, Brian; Terpening, Dustin (ECY)
Subject: Fwd: miscellaneous questions on units, etc for Cornwall RIFS

Hi all-

I am still trying to get the doc that shows how the wood waste criteria were developed. I have made so many different requests to Brian (which he has answered), I think this *may* have dropped off the radar, so I am sending the request once again to all of you!
Thanks!
Wendy

---------- Forwarded message ----------
From: **Gouran, Brian** <BrianG@portofbellingham.com>
Date: Fri, Sep 13, 2013 at 4:59 PM
Subject: RE: miscellaneous questions on units, etc for Cornwall RIFS
To: Wendy Steffensen <wendys@re-sources.org>
Cc: "Adams, Mark (ECY)" <MADA461@ecy.wa.gov>

Hi Wendy,

Good catch on the units on Figure 6-1. The thickness represented in that figure are in feet. The narrative describing the information presented in that figure is in Section 6.2.1.

Regarding the page 6-19 bullets, that is referring to accumulation of sediment impacted with woodwaste in thickness, not aerial extent, so square feet would not apply. All of the bullets combined would indicate that any point with any detectable refuse, or an accumulated thickness of more than one-foot of sediment where wood debris makes up >50% of the sediment (in cross-section) and less than one-foot of clean sediment over the refuse or woodwaste represents an "exceedence".

I only have the e-mail communication that we provided to your intern yesterday so I may have to work with Ecology and Landau on the reference/citation for how exactly these were developed and get back to you.

Enjoy the weekend.

Brian

19

From: Wendy Steffensen [mailto:wendys@re-sources.org]
Sent: Friday, September 13, 2013 4:17 PM
To: Gouran, Brian
Subject: miscellaneous questions on units, etc for Cornwall RIFS

Figure 6-1: What are the depth units supposed to be?

On p 6-19, the refuse and wood criteria are confusing. Should the 1 ft accumulation in bullet 1 be 1 sq ft? And the Kovacs reference does not actually provide any rationale for these numbers. Do you have a citation you can forward to me for the rationale?

Thanks!

Wendy

--

Wendy Steffensen, Lead Scientist

North Sound Baykeeper Team
RE Sources for Sustainable Communities
2309 Meridian St.
Bellingham, WA 98225

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360 739-5518 (cell)

--

Wendy Steffensen, Lead Scientist
North Sound Baykeeper Team
RE Sources for Sustainable Communities
2309 Meridian St.
Bellingham, WA 98225

360 733-8307 (office)
360 739-5518 (cell)

Adams, Mark (ECY)

From: Judith Akins [sunsetjam@gmail.com]
Sent: Wednesday, September 18, 2013 2:22 PM
To: Adams, Mark (ECY)
Subject: Comment Cornwall Ave Landfill cleanup site

Lastly, I am very concerned that this plan inadequately downplays the the effects of climate change on the entire project as well as the threat from tsunamis and earthquakes. I cannot believe that this site will be safe for over 100 years and that we are just pushing down a cost that will have to dealt with by future generations. I am requesting that you use the most stringent standards to contain this site for our future and our childrens' children.

Thank you for considering my comments and look forward to having our waterfront restored.

Sincerely,

Judith Akins
360-982-8599
2174 E Birch St.
Bellingham, WA
98229-4558

(20)

Adams, Mark (ECY)

From: Judith Akins [sunsetjam@gmail.com]
Sent: Wednesday, September 18, 2013 2:31 PM
To: Adams, Mark (ECY); McInerney, Lucy (ECY)

Dear Mark Adams,

Thank you for accepting comments on the Draft Cornwall Avenue Cleanup Site RI-FS. I am a resident of Bellingham while not a long time resident I have been coming here for 10 years and a full time resident for over 2 years. I have seen the waterfront change and I am very concerned about this project in making our environment as safe and beautiful as it should be. I love the water and enjoy walking and biking there as well as kayaking in the many bays and islands we have in the area. I have many concerns about the current plan; Alternative 2. I believe that this palm does not encompass adequate protection from disturbances and infiltration that Alternative 3 encompasses.

I believe Aternative 3 ,which reduces the amount of surface water runoff to 98% and groundwater to 95%, fulfils the " permanent to the maximum extent practicable " as stated in WAC 173-340-360 (3)(f) required. The proposed use of a 60-mil High Durability Polyethylene liner, which is the standard liner used in the Landfill industry, adds greater strength and durability to keeping the carcinogens contained. Also it adds a degree of confidence in the bonding of the sheets which is absent in the way the 20 mil is pieced together.

Secondly Alternative 3 adds more buffer zones to the stormwater leaching through the site. It improves the drainage coming from up site and goes deeper with thicker layers going into the shoreline. I believe we must do everything possible to keep this highly toxic water and sludge from entering the marine environment. The only alternative to this plan would be Alternative 4, which requires the removal of all contaminants. I do believe that 4 contains its own problems with the disturbance of materials. So, if we can't guarantee that these carcinogens are going to be capped and secured then we must remove them. We need a legal covenant that protects the area in perpetuity.

I am also asking that you add to your investigation the effects of bioaccumulation of chemicals such as cadmium, lead, mercury, PCB's , PAH's, dioxins/furans which were found on the site. What are the site specific standards on bioaccumulation? The current regulations do not adequately encompass the effects of what fish and shellfish people are ingesting and being exposed to on a daily basis.

I believe this site also should provide healthy habitats to marine as well as terrestrial animals. In accordance with SMP 22.08.040, DMP 22.08.100, and Section 9.4.1.1 of the RI/FS there needs to be vegetative corridors along the shoreline and from the shore to the uplands. Food sources for aquatic and terrestrial species will reduce erosion as well as establish habitats. Capping may impact the eel grass grass beds located below the proposed shoreline. This aspect of the cleanup needs to be closely monitored and mitigation should be considered in this aspect of the plan.

This plan also must take into consideration the cleanup of the R.G. Haley Site. It seems quite obvious that any plan must be coordinated with plans for this site since are also highly toxic materials here as well that must be contained. Please consider both site cleanups as one project. Lastly, I am very concerned that this plan inadequately downplays the the effects of climate change on the entire project as well as the threat from tsunamis and earthquakes. I cannot believe that this site will be safe for over 100 years and that we are just pushing down a cost that will have to dealt with by future generations. I am requesting that you use the most stringent standards to contain this site for our future and our childrens' children.

(21)

Thank you for considering my comments and look forward to having our waterfront restored.

Sincerely,

Judith Akins 2174 E Birch St Bellingham, WA 98229-4558

Judith Akins

360-982-8599
2174 E Birch St.
Bellingham, WA
98229

Adams, Mark (ECY)

From: Williams, Brian W (DFW)
Sent: Thursday, September 19, 2013 2:14 PM
To: Adams, Mark (ECY)
Subject: Cornwall Ave Landfill

Mark,
With regard to the proposed preferred cleanup option for the Cornwall Avenue Landfill, WDFW requests that you minimize impacts to the existing eelgrass habitat to the extent possible when finalizing the design of the preferred cleanup option for the site. WDFW will provide detailed MTCA substantive comments during the 2014 design and permitting period. Thanks

(22)

Adams, Mark (ECY)

From: Louann Chapman [loumura@gmail.com]
Sent: Thursday, September 19, 2013 3:08 PM
To: Adams, Mark (ECY)
Subject: Comments to RI/FS Report on Cornwall Avenue Cleanup Site
Attachments: Waterfront letter.doc

Please open attached letter

(25)

To: Mr. Mark Adams
Re: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

Thank you for accepting comments on the Draft Cornwall Avenue Cleanup Site RI-FS. I have been a resident of Bellingham for a total of 30 years and was born here. After reviewing all the proposed alternatives for the cleanup I was left with sadness that previous generations of neglect and abuse of our lovely shoreline has left us with no good answers. The best for our community would be to remove everything and ship the toxic dump elsewhere (alternative #4) but this would only leave another community to live with the poison and that is unethical and selfish. In addition, to stir up toxins here so much, we couldn't begin to know the effects of this on our waters and habitat. So, despite the Catch 22, damned if you do, damned if you don't, I ask that Alternative #3 be chosen but with the following expressed serious concerns:

Concern #1 I am seriously concerned about the level of habitat protection in the current draft. Capping may impact the eelgrass beds located below the proposed shoreline stabilization system, and these beds are critical for habitat and to prevent erosion. It is imperative that monitoring of this aspect be done during the cleanup.

Concern #2 The thicker the liner the better (and I understand the most costly). But we are talking decades of use of this area and our habitat, plants, animals and marine life deserve better. We aren't told the lifespan of this 60-ml polyethylene and I suppose it's impossible to ascertain this as it depends on so many factors like welding holes and holes potentially from debris in the cement/dioxin sediment as to whether dioxin and other poisons stay sealed away from water sources.

Concern #3 Alternative #3 offers the thickest layer of sediment material to contain the refuse and wood debris. In addition, the plan includes up-gradient groundwater diversion to reduce groundwater flow through the site in hopes that less contaminants get into the bay. I am also very concerned if the level of topsoil on the surface is sufficient to support vegetation of the upland site. I ask that vegetative corridors along the shoreline and from the shore to the land be installed to protect plant and animal habitat and food sources for aquatic and terrestrial species, and to reduce erosion. The "steep and forested hillside" located east of the site and east of the BNSF tracks is NOT sufficient! The only way to ensure connectivity and benefit species is to add vegetative corridors from the water to upland.

Concern #4 I ask that your draft include a small pocket beach on the southwest end of the cleanup site to ensure increased habitat for intertidal organisms and provide recreational opportunities.
Sincerely,

Louann Chapman
2216 A Street
Bellingham, WA 98225

Adams, Mark (ECY)

From: John Riggs [johnriggs87@gmail.com]
Sent: Thursday, September 19, 2013 3:31 PM
To: Adams, Mark (ECY)
Subject: Cornwall Cleanup--My support for Option 3---

Dear Mr. Adams,

Thanks to you and all your people for the research and presentation of these 4 options. I will state at the outset that having read and listened to the presentations, my choice would be for option 3. It seems to offer a more secure containment system than 1 or 2, and I think 4 might create much unanticipated mess, and expense.

I want to explain that at least a part of my interest in this project stems from my own on going treatment for heavy metal poisoning. We must do the best that we practically can to protect/repair our environment wherever we can.

Respectfully, John Riggs

2517 Victor St
Bellingham
360-510-3928

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Adams, Mark (ECY)

From: Lynne Pendleton [mlpendlet@gmail.com]
Sent: Thursday, September 19, 2013 3:52 PM
To: Adams, Mark (ECY)
Subject: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

Mr. Mark Adams,

Thank you for accepting my comments on the Draft Cornwall Avenue Cleanup Site RI-FS.

The cleanup of this site will have long lasting consequences for the health of Bellingham Bay and correspondingly for the health of our community and its economy. I am concerned that the decision on the cleanup of this site be based on long the term effects on our environment and not primarily on costs.

My wish would be to see this site restored as nearly as possible to conditions that existed before European settlers began to create the polluting conditions that we are dealing with now. We owe it to those who will live here in the future - many our descendants - to remedy, and not repeat, the mistakes made in the historical and recent past.

I recognize that my wish may be nearly impossible to fulfill. With this in mind, I urge you to do as much as possible to clean up this site. While I would like to see all contaminants completely removed, I understand that the process would have the potential to spread the pollution and destroy existing marine ecosystems.

If the contaminants are not to be removed, but to be contained ("capped") in place, it is critical that this be done to the highest standards, and cover all affected areas. The marine, the shoreline and the upland environments must all be carefully restored and protected by any proposed cleanup plan.

Alternative 3 appears to be the most serious attempt to contain and limit the negative effects of the existing toxic contamination. I see that it proposes a higher grade of capping liner that would be less susceptible to failure. It addresses a mechanism for limiting groundwater infiltration of the site. This is a good start.

I am also concerned that this cleanup of this particular site be coordinated with the overall redevelopment of the rest of our wonderful Bellingham waterfront.

I look forward in the future to enjoying the beauties of our clean and restored waterfront.

Sincerely,

(25)

M. Lynne Pendleton

2415 Williams St

Bellingham, WA 98225

Adams, Mark (ECY)

From: Eleanor Hines [eleanorehines@gmail.com]
Sent: Thursday, September 19, 2013 5:17 PM
To: Adams, Mark (ECY)
Subject: RE: Comments to RI/FS Report on Cornwall Avenue Cleanup Site
Attachments: Surfrider Cornwall Landfill Comment.pdf

To Mark Adams,

Please find the comments from the Northwest Straits Chapter of the Surfrider Foundation attached to this email regarding the RI/FS Report on the Cornwall Avenue Cleanup Site. Thank you for your time and consideration.

Thanks,

Eleanor Hines

Chapter Chair

Northwest Straits Chapter

Surfrider Foundation

nws@surfrider.org

nws.surfrider.org

215-287-0043

The Northwest Straits Chapter of the Surfrider Foundation (NWS) is based in Bellingham, WA. We are a 501 (c)(3) non-profit environmental organization dedicated to the protection and enjoyment of the worlds oceans, waves, and beaches for all people, through conservation, activism, research and education.

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TO: Mr. Mark Adams, Ecology Site Manager
3190 160th Avenue NE
Bellevue, WA 98008-5452
VIA E-MAIl : mark.adams@ecy.wa.gov

SURFRIDER
FOUNDATION
NORTHWEST STRAITS CHAPTER
P.O. Box 2973
Bellingham, WA 98227

September 19, 2013

RE: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

Dear Mr. Mark Adams,

Thank you for accepting comments on the Draft Cornwall Avenue Cleanup Site RI-FS. As a Bellingham chapter of an international nonprofit organization dedicated to protecting the enjoyment of the world's oceans, waves, and beaches for everyone, the Northwest Straits Chapter of the Surfrider Foundation is interested in the results of this cleanup process, and look forward to watching the overall waterfront redevelopment process move forward.

In order to ensure protection of those who may wish to enjoy the waterfront area recreationally, as well as to ensure support for and protection of habitat in this area that has already been degraded, we support Alternative 3. After reviewing all of the proposed alternatives for the cleanup site at Cornwall, we prefer Alternative 3 for the following reasons:

Alternative 3 provides a more robust sediment cap for the contaminated site with a thicker liner that is easier to weld together for a high quality seal and has a longer life expectancy than the liner proposed in Alternative 2. The liner proposed in Alternative 2 is not durable enough to ensure that there is no infiltration of groundwater and therefore leaching of unwanted chemicals may result and enter into the nearshore marine environment where community members recreate and where edible/fishable marine plants and animals may bioaccumulate toxicants that could also impact human health.

We are also concerned about the effect of the landfill on the fish, crabs, and other animals that use the bay. Alternative 3 is better for the marine cleanup because it includes an additional 12" (18" total) of sediment material, which is meant to isolate and contain the refuse and wood debris below the 10 MLLW mark, whereas alternative 2 has only a thin layer of sediment below 10 MLLW and would not isolate the garbage from the landfill. Alternative 3 also includes up-gradient groundwater diversion to reduce groundwater flow through the site to reduce the amount of contaminants that get into the bay, but Alternative 2 does not.

This site should be restored so it once again can provide healthy habitat areas. Surfrider is concerned about the level of habitat protection in the current plan. According to the City of Bellingham's Shoreline Master Program (SMP), there should be, "no net loss of ecological function." However, capping may impact the eelgrass grass beds located below the proposed shoreline stabilization system. Eelgrass beds provide critical habitat for many marine species as well as prevent erosion. We feel very strongly that this aspect of the cleanup should be closely

monitored. We ask that you please ensure that the public has a voice in reviewing the capping design and mitigation plans for eelgrass.

The SMP also says that native vegetation should be established to restore ecological functions and ecosystem wide-processes. The RI/FS says that, "the surface cover of topsoil would support re-vegetation," of the upland site. Please install vegetative corridors along the shoreline and from the shore to the upland. Ecosystem benefits from native vegetation would include: the protection of plant and animal habitats, providing food sources for aquatic and terrestrial species, reducing accelerated erosion, and providing habitat corridors parallel and perpendicular to the water body.

Lastly, please consider the plan to create a beach on the southwest end of the cleanup site, as envisioned by the Waterfront Futures Group in 2004, and include small excavations in that area to make a pocket beach. This would increase habitat for intertidal organisms and provide additional recreation opportunities.

Thank you for considering our comments. We hope that our participation in this public comment period will help lead to positive improvements to the RI/FS, improve the quality of nearshore recreation, and lead to additional habitat enhancement in Cornwall Landfill cleanup plans.

Sincerely,

Eleanor Hines
Chapter Chair
Northwest Straits Chapter
Surfrider Foundation
215-287-0043
nws@surfrider.org

Adams, Mark (ECY)

From: Tip Johnson [tip@skookum.us]
Sent: Thursday, September 19, 2013 5:18 PM
To: Adams, Mark (ECY)
Subject: Cornwall Avenue Landfill

Hi Mark,

Thanks for this opportunity to comment.

I earlier detailed my first concern with the proposed capping in a graphic produced in response to the log pond cap.
http://www.skookum.us/fowcweb/GP/images/logpond_topo_opt.jpg

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WHERE'S IT SUPPOSED TO GO?

Showing the location of the Log Pond and Chem-Fix mercury dumps, and why the area's topology means capping can only amount to a cover-up that will not prevent releases of mercury to the environment.

Like the logpond, the hillside above this current capping scheme includes a large area of pervious surface - the University, the Sehome Arboretum, and the landscaped portions of the residential area. Our prodigious rains soak into

the ground and will pass under the cap, washing contaminants into the bay.

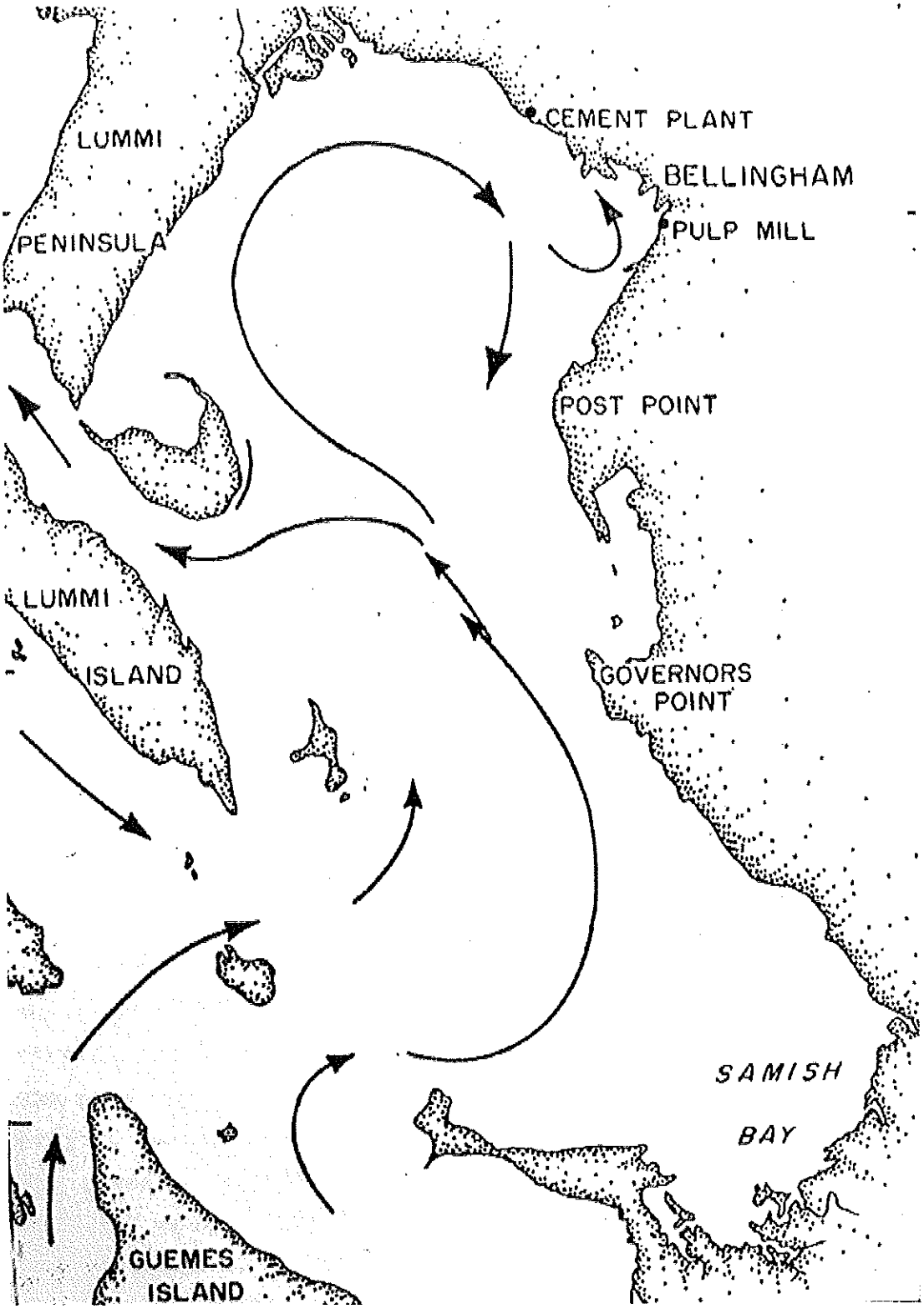
As was demonstrated with the Chem-Fix slab, capping did not prevent the mercury levels from diminishing over time. The presumption is that mercury migrated through the poor quality concrete and was washed into the bay by groundwater under the asphalt cap.

Getting stuff to "go away" has been the art of environmental management for too long. Dumping in ravines, gravel pits, along streams - even those designated for juvenile fishing - or as here, on the waterfront has long been de rigueur, but should no longer be acceptable. I hope the DOE won't stoop to industry's traditional tactics.

Our first capping adventure, the Chem-Fix slab, turned out to be nothing other than an unregulated long-term release that everyone got away with. Will we now have to clean it up for real? The log pond cap hasn't been fairing that well either. It may require constant monitoring and maintenance, and probably an eventual actual cleanup. It is more efficient to do these things correctly, once.

Now large piles of dioxin contaminated sediments have been piled on top of vast quantities of municipal solid waste with a substantial medical waste component, judging from the shoreline debris. I cannot see how capping the top and the waters edge can ever prevent the inexorable flow of groundwater from eventually washing unwanted compounds into the bay.

We should also look to the origins of the dioxin. It has been well known since the oceanographic study of the Bellingham-Samish Estuary in the 1960s that a slurry of suspended wood solids floats over a large area of the bay bottom in what the study referred to as the "inner harbor" area, trapped in the gyre of "concentrating currents". This has long been attributed to bark from log booming and escaped suspended solids from the pulping operation. But bark from trees doesn't have a lot of dioxin. You need chlorine for that.
http://www.skookum.us/fowcweb/GP/images/eddies.550.gif



What is not well known, as reported to me by a diver once hired to clean the pipe, is that G-P's clarifier at the head of the Whatcom Waterway was intentionally undersized for their volume in order to save scarce real estate. A genuine clarifier would have been many times the size of their toy clarifier. Instead, they reportedly installed it with a 'cheat pipe' so that suspended, chlorinated pulp was flushed directly into the mouth of Whatcom Creek. This is likely the primary source of most of the suspended, hydric slurry and the dioxin in the dredged sediments now stored on the old city dump. This cheat pipe should be easy to verify and, if true, could be the basis for a serious, actionable offense that could help fund a real solution for those sediments.

That's my point. Let's look for a real solution. Covering it up only to have to clean it up later does not make sense. Going after liable parties to effect a real cleanup does. I'm pretty sure G-P's dioxins have yet to be part of the conversation or any of the local agreements. Both sea level rise and meteorological extremes anticipated with climate change make half measures a bad investment on this waterfront.

Perhaps the old garbage has leached most of it's mobile contaminants. I don't know. But why add the dioxins to the mix? If we are sheltering the dump in place and armoring the shoreline, we should attempt to restore as much shoaling beach-like nearshore habitat as possible. Bellingham Bay was one of the world's largest oyster farms before the mill arrived. They were assured their farms wouldn't be harmed but the mill ruined them and litigated the farmers into oblivion. Nevertheless, the standard we should achieve is edible shellfish from our shores and edible fish from our waters - not somewhere else out there, but right here in Bellingham Bay. This is the only way we can restore the now endangered animal populations that sustained human habitation for millennia. It is a good long-term investment. It is spoiled if we pile immense quantities of a notoriously mobile carcinogenic compounds immediately adjacent and upgradient.

Let's stop the cover-ups and quit dumping on the waterfront, and really clean up the problems we have. Thank you,

Tip Johnson
2719 Donovan Avenue
Bellingham, WA 98225
Tel 360-255-1200
Fax 206-350-3664
tip@skookum.us

Adams, Mark (ECY)

From: Libby Hazen [libmh@comcast.net]
Sent: Thursday, September 19, 2013 8:16 PM
To: Adams, Mark (ECY)
Subject: Cornwall Avenue Landfill Cleanup

Dear Mr. Adams,

I appreciate the opportunity to comment on the draft for the Cornwall Avenue landfill cleanup. As a resident and taxpayer in Bellingham with children and grandchildren also living here, I'm very concerned about this project. I prefer Alternative 3 because it is a more thorough clean up of the many toxins that threaten to contaminate not only the proposed park, but the bay and the fish. I think we who live, work, pay and play here deserve the cleanest possible result for our investment. I ask that the dioxin cap be removed completely.

Thank you for your consideration.

Sincerely,

Libby Hazen
116 Bayside Place
Bellingham, WA 98225

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Adams, Mark (ECY)

From: Katrina Novakova [katrinanovakova@hotmail.com]
Sent: Thursday, September 19, 2013 10:30 PM
To: Adams, Mark (ECY)
Subject: Re: Comments to RI/FS Report on Cornwall Ave Cleanup Site

Date: September 19th, 2013

To: Mr. Mark Adams

RE: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

Thank you for taking the time to consider my comments regarding the Draft Cornwall Avenue Cleanup Site RI/FS. I am a resident of Bellingham, a Registered Nurse, a former commercial fisherwoman and have a great interest in the Cornwall Avenue Cleanup Site. As we are in the early stages of the waterfront development process, the decisions made regarding this Cornwall Site cleanup process will set an important precedent.

I have reviewed the preferred plan of the Port of Bellingham as well as the alternative options that have been offered. I would like to propose that the 47,000 cubic yards of fine-grained sediment from the 2011 Squalicum Marina dredging be removed from the site and relocated to an appropriate inland disposal site. This sediment has not yet been integrated into the municipal waste site and currently sits on top of the municipal waste site. Analysis has found this sediment contains metals, PAHs, phthalates, dioxins and furans, and ammonia. This sediment is especially concerning to me due to the level of dioxins that are present. I have a spent nearly a decade as a Registered Nurse working with Veterans, the majority of which served in Vietnam. I witness daily the endocrine, immune, cardiac and hematologic effects of even the briefest exposure to concentrated dioxins in the form of Agent Orange whether in the jungle or simply drinking contaminated water. It would be irresponsible to attempt to contain this material with any of the proposed polyethylene liners as they all have limited lifespans of less than 100 years. It would be downright unconscionable to use the Port preferred 20ml liner which at best receives an installer warranty of just 5 years and is known to be so fragile that sewing and taping are the industry standard for joining the material as it cannot tolerate heat-welds.

As referenced above, the municipal waste and wood waste should be treated in isolation from the Squalicum Marina sediment. This waste, however, should not be treated in isolation from the R.G. Haley site given the R.G. Haley contaminants continue to infiltrate municipal and wood waste at the Cornwall site. It would seem reasonable, and cost effective, to address the R.G. Haley site in tandem with the Cornwall site and develop a permanent, long term solution. I am concerned the Port preferred option as well as the alternatives are driven by artificial boundaries that in effect do not exist and will ultimately be more expensive for the citizens of Bellingham.

Finally, I have concerns about permanence of these proposals. During a recent community meeting, a Port of Bellingham representative clarified that the Port's preferred plan is factoring in an estimated sea-level rise based

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on a 100-year timeframe. While the sea-level rise estimate is moderate by many climate change science standards, even if it proves accurate, it is only for a 100 years out. I strongly advocate for Cornwall Avenue site cleanup plan that has a longer, more permanent, outlook. The only true permanent solution is to remove the contaminated sediment and waste from the site and restore the site to its historic intertidal habitat. If it is not possible to remove the municipal and wood waste due to worsened contamination during the process of removal, then every effort should be made to create the most robust containment system for the remaining waste to insure a safe and healthy habitat for humans and marine life alike. The current "cap" containment with 20-80ml liners proposals and alternatives are not robust enough and should be revamped to include the thickest, sturdiest liner available before any further consideration by the Department of Ecology. Every effort should be made to stretch the timeframe beyond 100, 500 or even 1,000 years to do our best for the future generations to come.

Sincerely,

Katie Novak

2000 Harris Avenue

Bellingham, WA 98225

Adams, Mark (ECY)

From: Gaythia Weis [gaythia@gmail.com]
Sent: Friday, September 20, 2013 5:56 AM
To: Adams, Mark (ECY)
Subject: Public Comment: Cornwall Landfill Cleanup
Attachments: Cornwall Avenue Landfill Gaythia Weis Public comments.pdf

Mark Adams -- Site Manager

Department of Ecology

3190 160th Ave NE

Bellevue, WA 98008-5452

mark.adams@ecy.wa.gov

My comments regarding the Cornwall Landfill Cleanup are attached here.

Sincerely,

Gaythia R. Weis

InfoPteryx LLC

1713 Edwards Ct

Bellingham, WA 98229

gaythia@gmail.com

(30)

TO:

Mark Adams -- Site Manager
Department of Ecology
3190 160th Ave NE
Bellevue, WA 98008-5452

mark.adams@ecy.wa.gov

FROM:

Gaythia R. Weis
InfoPteryx LLC
1713 Edwards Ct
Bellingham, WA 98229
gaythia@gmail.com

September 20,2013

RE:

Public Comments
Public Review Draft
Remedial Investigation / Feasibility Study
Cornwall Avenue Landfill
Bellingham WA

Introduction

The Lummi position on the Cornwall Landfill is a powerful and articulate statement of what is clearly the moral high ground. **LummiNationCommentsRI-FS_CornwallAvenueLandfill092013.pdf**

What the State of Washington, and the .City and Port of Bellingham need to formulate is a clearly outlined, action oriented, scientifically supported way forward.

The Cornwall Landfill has been closed since 1965. I think that there are steps, especially involving upland groundwater diversions, that should be taken right now. Sadly, I believe that there are many hazardous situations present in Bellingham Bay which can only be mitigated, not

fully restored back to the original state that was present as western settlers arrived on the scene.

I advocate an "Alternative # 3" like solution. I feel that this provides the best, long term solution possible with a high grade landfill geotextile cover, groundwater protection, and a bay side infiltration system that is likely to hold up over time and remain isolated from humans and wildlife using this area. It comes the closest to meeting the requirements of a properly done modern landfill (which of course, would never be allowed in this location). I would like to see modifications to the shoreline such that habitat areas could be provided. Additionally, I think that a commitment needs to be made for more monitoring of this site, both chemical and geophysical, over time within this proposal.

On total removal:

I think that the authors of this report need to rework their description of alternative #4, as I believe that, as given, there is gross incompleteness here as to how much disruption and toxic contaminant spreading a complete removal process is likely to entail. I think that this is giving the public unrealistic expectations that such a complete removal is even possible.

In my opinion, those advocating complete removal need to bear in mind what the practical implementation of this would entail. Removing landfill materials from under the bay would be a highly risky, involved, and expensive process. Previously unknown, highly toxic, materials could easily be exposed. Slurping up randomly sized, and random density, glop would be messy. This is astronomically more complicated than drilling pilings into the bay for an overwater walkway, for example. But there are technologies available, at an exceedingly high price, that might be useful. At the the Fukushima Daiichi nuclear plant, they are now looking into techniques that would freeze contaminated sediments, making them removable without (much) stirring into offshore waters. There is a Seattle company that specializes in doing this. See: http://www.soilfreeze.com/ It is, of course, extremely expensive. Another alternative here might be an offshore coffer dam, although it is unclear to me what the intersection is offshore, between this waste stream and, say, the mercury contamination moving down from the GP site.

I would advocate a frank conversation with Lummi representatives, and the rest of the public, to create an itemized list of environmental remediation projects that they wish the Bellingham community to engage in. RG Haley on one side of this, and the Georgia Pacific Plant a little further away as well as the old Coal gassification plant on the other would IMHO deserve high priority. Our stormwater and wastewater treatment facilities and boat harbors create problems. But the landfill does represent significant unknowns, as these comments in the report emphasize:

> *From 6.1*
>
> *As discussed in Section 3.0 (Remedial Activities), soil, refuse, and wood waste within the landfill*

*is **assumed to contain hazardous substances** above applicable MTCA soil cleanup levels **and extensive soil quality testing was not conducted during the RI.***

It is assumed that refuse poses a threat to human health or the environment through direct contact or release to the environment, and will be addressed in general accordance with regulatory requirements for solid waste landfills

Industrial waste disposal attitudes prior to the closure of this landfill in 1965 were quite different than they would be now.

We do need to face up to our responsibilities here.

2.0 Site Description:

The document describes the location as follows:

- DNR property or state land: The upland and in-water area owned by the State of Washington seaward of the Inner Harbor Line.
- Cornwall property: The upland area formerly owned jointly by the Port and the City, and now solely by the City.
- BNSF railway mainline: The upland area owned by BNSF.
- The Cornwall landfill, Cornwall Avenue Landfill, or the landfill: The area containing municipal refuse.

I believe that this site cannot be considered separately from the adjacent, also contaminated RG Haley wood processing facility site and within a context that include such things as the former Georgia Pacific Paper Mill, a coal gasification plant, and a ship harbor.

As this document notes, contamination from the RG Haley site has spread onto the Cornwall Landfill. This is indicated in numerous places, including Figure 7-2. From a related document, on page 8 of the RG Haley Sept 5 2007 RI/FS , Douglas Management Company,:

A portion of the landfill waste body extends onto the northwest corner of the Haley Site, as shown in Figures 2A and 3.

Additionally, without unified consideration I think that considerable finger pointing back and forth over the property line will impede analysis. For example, the RG Haley document contains the following accusation regarding wood treatment contaminants that might be present in the Cornwall Landfill. Insofar as I could determine, the Cornwall Landfill document, under review here, simply blames RG Haley for these sorts of contaminants.

Information in DNR files indicates that Frank Brooks Manufacturing Company (Brooks) dumped oil at the Cornwall site after the closure of the landfill (RETEC, 1997). Brooks held leases on the landfill area and the DNR-managed portion of the Site. The files indicate that DNR considered Brooks' actions to be "unauthorized and unconstitutional." Furthermore, DNR considered legal action to force Brooks to stop this activity and to cover the dumped oil. The dumping of oil at the Cornwall site by Brooks is of particular concern because Brooks treated wood in the Bellingham area. Brooks historically used both creosote and PCP to treat wood. RETEC indicated that Brooks, originally known as Ralph Turner Pipe and Tank Company until 1935, has treated wood at Iowa Street in Bellingham since 1915.

I noticed that just this week the city approved purchase of a "organophillic clay" as part of the interim remedial work for the RG Haley site, at the last Bellingham City Council meeting.

https://fortress.wa.gov/ecy/publications/publications/1309122.pdf

"The general plan is to place a 6-inch layer of sand with specially treated clay over a 5,000-square-foot area of the shoreline to absorb oil seeping out. The sand/clay layer will absorb oil while allowing water to pass through. To prevent erosion, a tough fabric sheet will be placed over the top, followed by large rock. This is meant to be a temporary fix while the process to develop the final, site-wide cleanup continues."

My concern with this is the "while allowing water to pass through" part. It seems to me that both clay and plastic are fairly impervious. I would think that this structure would necessarily restrict flow and cause pooling behind it.

a). This could get overwhelmed in a flooding or high groundwater situation.

b). I don't see why the groundwater flow, and the contaminants it contains, would not just spread sideways until reaching an easier path down to the bay.

Thus, I think this process raises more questions for the adjacent Cornwall Landfill site.

And again, point to the need for a more unified plan rather than a series of temporary fixes here and there.

Another example would be the recent episode that occurred in warm summer weather, in which local officials were pleading with residents to stop calling 911 to report a gas leak, unless somehow they really thought there was a gas leak. The "rotton egg", hydrogen sulfide, odor was

apparently coming from anerobic conditions in the intertidal zone in the bay. The existence of this condition likely did diminish the ability of residents to detect and report a real gas leak.

Somehow, a sophisticated sense, that there are specific suspected sites, and yet open-mindedness of what might be coming from where, needs to be maintained.

Remediation Objectives

- *Characterizes the nature and extent of contamination for affected media (i.e., groundwater, sediment, and soil)*
- *Identifies preliminary cleanup standards for affected media*
- *Develops and evaluates cleanup action alternatives that protect human health and the environment*
- *Identifies a preferred cleanup alternative.*

This needs to include an objective that recognizes the need for long term monitoring of this site. Ongoing chemical measurements should be conducted. Regularly scheduled geotechnical evaluations of continuing site stability need to be conducted. Methods for measurement of accumulations of low level contaminants, and bio concentration issues should also be implemented.

2.1 Site History

This section starts with:

Historically, the majority of the Site consisted of tide flats and subtidal areas of Bellingham Bay.

I believe that this section needs to include the recognition that, as I have personally observed, immediately offshore (and a bit (200 yards?) to the south, reef net fishing from small boats is an ongoing occupation. I presume this is by local Native Peoples, practicing their rights "since time immemorial". These real and current uses need to be recognized in this report.

With regards to warehouse buildings formerly on this site, the document notes:

Sometime prior to 1953, a wood-framed warehouse was built in the southern corner of the Site, and another smaller wood-framed warehouse was built (date of construction unknown) near the northeastern corner of the Site.

From 1971 to 1985, the Site was leased to Georgia Pacific West (GP) by the Port, including sublease of the state-owned portion of the Site.

The use of the warehouses prior to GP's leasehold is unknown.

The year 1971 is well within the lifespan of people who would have worked there. More investigation to find such persons and interview them should be made.

Additionally, I think someone needs to review this document, the RG Haley document and others to insure that the histories are consistent, and that the most recent version is the best available. See note under Site Description above.

2.2 Previous site investigations

I noted here that in 1997 one of the seep well samples, S-2 exceeded the radiochemistry standard for gross beta radiation. I point this out simply because I think it indicates the heterogeneous, unknown aspects of what may or may not be contained within this landfill.

I think that one big problem with the groundwater seep sampling conducted previously on various occasions, is that, while it may be representative of fairly average conditions, it does not set out what may be worst case, high groundwater, high rainfall, high storm surge events.

2.3 Relationship to other Documents and Plans

The remedial alternatives developed for the Site need to protect human health and the environment under future land use.

Note that city waterfront planning maps seem to prefer to label this area "Cornwall Beach" I fear that this sets up unrealistic expectations as to what "beach" activities may reasonably be conducted there. Children swimming? Clam digging?

3.0

Most of this material covered in later sections

4.1.1.2 General Site Drainage

I have a few additions to the information given in this section, as noted below. What is important here is not only normal conditions, but also how the system would function under extreme weather events. As I pointed out to Ecology site manager Mark Adams at a public meeting held on Wednesday, Aug. 28, at the Bellingham Public Library, such events may become more frequent with global climate change conditions.

Soil coverage and slope drainage: Diagrams in this report, such as the geologic cross section given in Figure 4-8, seem to leave the false impression that the slope above the site is solid bedrock. In fact, soil is quite thin in spots, and bedrock is exposed in a few areas. But this area does have a variable soil cover. The book: ***Soil Survey of Wahtcom County Area, Washington***; United States Department of Agriculture, Soil Conservation Service, May 1992 gives maps and descriptions of area soils. The Chuckanut urban land complex is described as variable, but well drained on slopes, and moderately permeable but with high water capacity. Runoff is described as medium.

My notes regarding the area upland of this site:
There is a sidewalk and gutter on the east (uphill) side of Boulevard up from the landfill.
There is a crest in the ridge directly behind the landfill. Bare bedrock is exposed in places on the uphill side of the street. There is also almost a wall of condos above that site, all of which have foundations at or close to hedrock, and so must have done something ahout drainage beneath them; such as sump pumps and drain hookups. This makes this street, in general, a good stopping point for where to consider groundwater flow into Cornwall dump, as the document indicates.

A couple of areas of concern: There is not actually a storm water drain system in Boulevard Street until much lower on this crest to the north and south.

At a point below the Cliffside restaurant (which fronts on State St, one block above), which is also directly uphill from the Cornwall Landfill / RG Haley property line, there is a "Y" shaped driveway leading to what is really an alley which has drainage ditches alongside it. There are three drains I see there. The major one appears to be documented, per a conversation with a city public works employee and use of the cities "IQ" online mapping system, to flow directly into the sewer system.

Further north the Public works employee explained to me that there is a major storm drain line at Cedar St. At this location on Boulevard, there were originally drains that went directly into the sewer, but this overflowed at some point in time and the two systems (storm and sewer) were separated here. This Cedar St storm water drain line continues downhill, runs directly across the RG Haley property and into the bay. The Public works employee told me that this line has been carefully inspected for integrity, especially under the railroad and found to be intact. I was told that this inspection was done in the dry season, when very little flow could be anticipated. So, in times of high water, it is possible that leaks from the joints in this pipe could pump groundwater into the RG Haley site beneath any cap placed there. Or, if the RG Haley material was water saturated, those contaminants could leak into the pipe and be jetted right out into the bay.

Not ideal situations in either of the two cases above, particularly if there were severe rain storms or snow turning to rain, and/or heavily saturated soils.

From the Bay trail (just below Boulevard St): The trail is also an old rail line and so nearly level. Much of the part behind Cornwall Landfall is behind a cut through bedrock. The ditches along the trail drain down the hill either side of that. There is also a place over a gully where it appears to me that the railroad once had a bridge (old timbers can be seen). No water running here but it is a drainage that aims down towards the part of the HG Haley site where some diagrams show a "perennial seep".

There also apparently is an old drain running from one of the now demolished warehouse buildings down to the bay.

All of this runoff would be easy to correct and control so that there was little impact on the Cornwall Landfill in my opinion.

In my opinion, designs for the upland drainage onto this site should be implemented in a manner that will accommodate extreme weather events. I believe that the near level corridors provided on the uphill (east) sides of the BNSF right of way and the Bay trail (also an old rail right of way) would be near ideal locations for such diversions. In my opinion, before draining into Bellingham Bay, such storm water diversions, and the current one on the property, should have nutrient and street contaminant mitigating "rain garden" type facilities.

USGS document noting that "100 year" extreme weather events will take place somewhere in Western Washington every 4.5 years: http://pubs.usgs.gov/fs/2011/3146/pdf/fs20113146.pdf

4.1.4 SEDIMENT DEPOSITION

While near shore deposition is certainly not my area of expertise, I would like to see more information as to how the sediment deposition rates given here are reconciled with the receding shoreline information as given in figure 4-5, particularly when this landfill has had such a long time period since closing to find a stable angle of repose. Why were woody materials still visible underwater for the scuba diving analysis? What happens in an extreme storm event?

7.2 FATE, TRANSPORT, AND ATTENUATION PROCESSES

The chemical environment of the landfill changes over time as the material decomposes. This landfill has been in place for quite a long time. On the other hand, relative to other landfills, the woody products component of this particular landfill was quite high, and sampling seems to indicate that it remains quite high.

Under the influence of groundwater as well as tidal fluctuations, materials can be expected to partition themselves somewhat within the landfill. Less dense petrochemical materials may float on top of the groundwater aquifer and coat sediment particles at that level. Above, in the zone that should be dry, dioxins, as in the "interim solution" overlying dredge spoils sediments, are likely to be heavily bound to the sediment particles and immobile as long as the particles remain immobile.

Metals could be present as ions in the aqueous phase, or they could be carried as organic complexes and colloidal material. Or attached to fixed woody material and kept in place. If methylated (as in mercury) they could be a vapor. Anaerobic environments could produce reducing conditions in which free metal ions would travel readily with the groundwater, as compared to the metal oxides. And the leachate could be strongly acidic, and thus corrosive, again favoring solubility. Or anerobic conditions could favor metal sulfides that would be less soluble.
What happens may be complex, and vary within the landfill by location. These are not just different geochemical environments, they are different biochemical environments as mircrobial organisms ingest and work to decompose the material, themselves dependent on the anerobic/aerobic, (reducing/oxidizing) and acidic/alkaline environments.

The parts of the landfill that are inland and saturated with groundwater may function quite differently than those that are mostly or sometimes dry. And different yet than the parts that are subject to tidal fluctuations.

Stages of a more homogeneous landfill have been described in different ways. For example:

Phase I: Initial Adjustment - Within a short time after the waste is deposited, a community of microorganisms builds up to a population sufficient to begin to significantly alter the waste.

Phase II: Transition – Transformation from the initial aerobic condition to an anaerobic environment takes place. A trend toward reducing conditions, in which elements or molecules gain electrons, is established as electron acceptors shift from oxygen to nitrates and sulfates. By the end of this phase, measurable concentrations of chemical oxygen demand (COD) and volatile organic acids (VOAs) appear in the leachate.

Phase III: Acid Formation – During this phase, some of the waste is hydrolyzed, i.e. it reacts with water producing soluble products. In this stage, anaerobic, acid-forming bacteria, now the dominant type, metabolize biodegradable organic matter in the waste producing VOAs. The resulting levels of VOAs lead to a lowering of pH, and tend to increase the load of dissolved metals in the leachate. Organic matter rapidly ferments during this stage.

Phase IV: Methane Production – Also referred to as the methanogenic phase, this period is characterized by the rise to dominance of another group of microorganisms, methaneproducing bacteria. These convert the organic acids produced in Phase III to methane and carbon dioxide. A highly reducing chemical environment develops, resulting in the reduction of sulfates (SO4-2) to sulfide (S-2). In one study, which included simulated MSW and simulated construction and demolition waste containing wallboard, it was found that wallboard was the major cause of hydrogen sulfide production, and that methanogenesis and sulfate reduction occurred concurrently.31 The pH rises as NH3 neutralizes H+ ions, leading to the depletion of VOAs and the increasing presence of ammonium (NH4+) ions. The pH is maintained in the neutral range, however, by bicarbonates (HCO3+), and this supports the continued flourishing of the methanogenic bacteria. The presence of sulfides and hydroxides (OH-) favors the precipitation of metals.

Phase V: Maturation – In this phase, biological activity declines due to the depletion of readily-degradable organic matter and other nutrients. Gas production also declines, and concentrations of pollutants in leachate are lower than in previous phases.
"Metals contained in glass or porcelain structures that manage to stay intact as they are placed in the landfill, and metals found within the matrix of certain plastics, glass, and ceramics, could remain unchanged in landfills for geological time spans."

From: The Fate of Heavy Metals in Landfills: A Review," by Dr. Michael Aueott,

http://www.nyas.org/programs/harbor/06_LFmetals.pd

My guess is that in this case, many of these phases function at once.

7.2.2 GROUNDWATER (and Landfill Requirements)

Other than shoreline erosion, groundwater is the primary transport media for upland contaminant migration at the Site. Because the upland portion of the Site is not completely capped with a low permeability material, and refuse and wood debris are in direct contact with groundwater, leaching of contaminants to groundwater is ongoing

This is the process to be limited by implementation of the alternatives.

The Aucott reference above lists the following for modern day landfills:

Another important characteristic of a landfill is its pollution control system. Today's landfills, pursuant to Subtitle D of RCRA, must include the following:34
1) A liner that is composed of two different materials that separates the landfill and its contents from the soils and bedrock environment below. The upper layer of the composite material must be a synthetic flexible membrane liner (FML) that is at least 30 mil (i.e. 30/1000ths of an inch) thick. ***If the FML is high-density polyethylene, as is typical, it must be at least 60 mil thick.****35 The lower layer of the composite liner must be a 24-inch compacted clay liner that has a hydraulic conductivity of no more than 1 x 10-7 cm/sec, meaning that fluids cannot travel*

through it easily, and
2) A leachate collection and removal system that is sufficient to prevent the depth of the liquid layer (i.e., leachate) above the composite liner from reaching any more than 12 inches.
The purpose of the liner is to prevent leachate from mingling with the underlying soils and aquifers. Instead of the single composite liner required by RCRA, landfills often use double composite liners, which consist of two layers of a geotextile/compacted clay composite liner. Modern landfills typically collect and treat leachate to remove metals, biological oxygen demand (BOD), chemical oxygen demand (COD), and bacteria before discharging the leachate to surface water, or they send the leachate to a publicly-owned treatment works.

8.0 DISCUSSION OF CLEANUP STANDARDS

In my opinion, it is very important to emphasize, as the report states, that:

Due to its nature as a waste material and inherent heterogeneity, the refuse was not characterized for soil quality during the RI.

Future actions taken must be mindful of the fact that much remains unknown. I believe that this speaks to the need for cleanup standards that are not locked into conclusions about indicator materials and broad spectrum enough to detect new changes.

Just because current conditions leave manganese and ammonia as choices for indicator species, does not mean that this will always be so.

As indicated in Table 8-1, there were exceedances of one or more of the water quality criteria for copper, manganese, and NH_3-ammonia. Each of these is identified as a Site indicator hazardous substance (IHS) based on exceedance of the SL with the exception of copper, as discussed below.

This site may make a smooth transition from one mainly in Phase IV to one mainly in Phase V, as described in the material above in section 7, or there may be some other change in which currently sequestered chemicals are released. These could be bio-geo- chemical changes or physical ones, such as the corrosion of barrel(s).

Broad spectrum testing, for chemical constituents such as described in tables 5.2 and 5.3 will need to be conducted at regular intervals.

Venting systems as described below need to have stacks tall enough to accommodate safe human use at the surface. I don't think that city waterfront plans for "Cornwall Beach" visualize this.
As a result, any VOCs present in Site soil will be addressed by the methane gas control system, which will eliminate the soil vapor as a potential exposure pathway for the Site.

See monitoring in conclusion section below.

9.0 FEASIBILITY STUDY (and cleanup alternatives)

A key point regarding items yet to be fully evaluated is:
As shown on Figure 9-1, the estimated boundary of the Marine Site Unit extends in some locations greater than 300 ft from the shoreline. The actual distance from the shoreline

may be greater than shown, when exceedances of the cleanup levels for PCBs and other bioaccumulatives are considered. Further evaluation will be completed during the design phase to define the in-water boundary of this unit.

Thus, we are being asked to select alternatives before the adequacy of such alternatives has fully been explored.

As noted in numerous places above, this site needs to be remediated in a fashion that is fully integrated with the work done on the adjacent RG Haley site. The wastes from both areas do not respect property lines.

As noted in the conclusion, I support a modified version of Alternative 3 as the best template for working towards a more completely fleshed out implementation. I believe that Alternative 2, (and certainly Alternative 1) are inadequate for many reasons, and that both are not long term solutions in terms of materials chosen (such as a thinner geotextile), groundwater and stormwater containment, and likely natural physical processes modifying the site (a thin offshore cover on the sand filter).

I do not believe that it is reasonable to assume continuous net deposition off of this site, particularly considering that the historic record seems to indicate shoreline erosion. The possibility of occasional large, shoreline scouring, storms needs to be accommodated.

Conclusion

I believe that Alternative 3, comes closest to meeting the needs of this site. This alternative provides better mechanisms for upland groundwater diversions, a geotextile cover that seems much more attune with a long term solution in terms of ruggedness, and longevity, and a much improved sub tidal cap and sand filter system. I believe that this would be a heavy duty enough solution to effectively survive most anticipated earthquake liquefaction, tsunamis, flooding or major storms without loss of most basic protective mechanisms, and with minimal reconstructive work necessary. And, in balance, it is important to remember the other hazards of such events, the many toxic things above ground level that would undoubtedly be swept into the bay.

Additions I would like to see include:

Stormwater:
Upland storm water improvements that start with a full storm water drain system on Boulevard Avenue, and removal of the potential for a sewer line overflow problem with the storm water interconnection above this site. I think that the city should re-route the storm water drain that currently flows through the RG Haley site. I would continue down the hill with diversions away from both the Bay trail and the BNSF right of way. I would like to see at least "rain garden" purification systems on all storm water outflows to the bay, such as the one currently on this site.

Monitoring:
The complexities, uncertainties, and changing environment of this landfill mean that it should always be monitored on a regular basis for geohazards and chemical constituents. The chemical analyses should be broad spectrum in nature so as to be likely to catch any contaminants that may become poised to percolate out of the sand filters, before they have the potential to reach levels of concern. Varying climate, biological and geochemical conditions

may lead to changing effluent. The chemical analyses to be performed, at reasonable intervals, should be expansive enough to detect new changes, as shown for example, by the listings in the Table 5.2 for groundwater and 5.3 for soils. The placement of continuing monitoring wells and other systems also will allow the addition of new methods as analytical detection systems, and knowledge of areas of probable concern, improve in the future. Well sites to analyze should be both on and offshore and sited with close enough spacing's to accommodate the heterogeneous nature of this site. Sample timing and methods chosen for analysis must be frequent and broad enough to detect changes. Certainly, indicator constituents can be used for monitoring much of the time. But statements such as that in the footnotes to Table 8.2: *PCBs used in RI/FS as surrogate for all relevant bioaccumulatives* should not leave the monitoring blind to additional information over time.

Bioconcentration:
Additionally, there needs to be ongoing measurements to determine levels that may be increasing by mechanisms of bioconcentration. This might include use of such things as mussel cages and food chain studies. Standards for acceptable levels of contaminants need to be set low enough to accommodate the fishing activities, and resulting fish consumption levels, that take place nearby. These need to be much more stringent than current Washington State standards.

Future use:
I don't believe that much of this site will ever be an appropriate place for buildings.

At a meeting I attended, plantings, included such things as trees, were advocated. Even with a 60mil geotextile liner, this is not, in my opinion, a good idea. The integrity of the cap must be preserved.

I do believe that creating connections for the residents of Bellingham with their natural surroundings along Bellingham Bay is crucial for creating ecological awareness that will aid in preventing similar environmental fiascos in the future. I support ideas that would give residents an opportunity to enjoy being by the Bay, but believe that this public use facilities on this site will need to be designed in ways that make it clear that this was a historic dump site. I think that much could be done that the public would find very interesting that would involve habitat reconstruction and species observation. These might include, eel grass beds, sand and reed shore bird and fish spawning zones, tall grasslands, and other such areas, rather than more physical forms of recreation.

Awareness of the limitations inherent in use of this site, and the ways in which the protective constructions of the mediation work need to be guarded, should be important components of the public education process.

Adams, Mark (ECY)

From: Janiene Licciardi [janienel@hotmail.com]
Sent: Friday, September 20, 2013 7:54 AM
To: Adams, Mark (ECY)
Subject: Cornwall Landfill RI/ FS comment
Attachments: Cornwall RI FS.doc

Thank you for accepting my comments.

Janiene Licciardi
2000 Harris Avenue
Bellingham, WA 98225

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Mark Adams, Ecology Site Manager
3190 160th Avenue NE
Bellevue, WA 98008-5452

Date: September 19, 2013

To: Mr. Mark Adams

RE: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

I thank you for accepting public comments during this very short comment period. I regret that I did not comment on the Interim Action of dredging Squalicum Harbor and dumping that material at the Cornwall landfill site, but I was not aware of the impending action at the time. I would have opposed it.

But time has rolled along, the Port of Bellingham has moved forward with their intended plans, we have the toxic dredge at the Cornwall site, and now we are faced with several alternatives to deal with it, none of which are easy or ideal.

I care deeply about the Cornwall Landfill site. I live a mile from Bellingham Bay. I keep a kayak at the Community Boating Center, and I paddle to the Cornwall site often, sometimes twice a week. I have landed on the shoreline there several times. Once I took guests from out of town to the site, where we landed briefly to eat a snack and watch seals. So I feel that I have fairly intimate contact and relationship to the place.

Of the four alternatives put forth, I prefer a combination of Alternatives 3 and 4. If Alternative 4 could be executed without further exposing the bay to dredge material, I would advocate for that, but the risk of contamination is too high. Instead, I would like the toxic dredge material (i.e. the mixture of Portland cement and dioxin-laden sludge from Squalicum Harbor) removed from the land completely and hauled to a safe toxic waste facility. Then, the rest of the toxic material underlying that layer (i.e. the old landfill refuse) should be treated as in Alternative 3, including the deep groundwater-diverting trench and at least a 60 to 80 millimeter HDPE liner, as is standard for all landfills, or preferably a 100 millimeter liner. The Cornwall Site *is* a landfill, after all, and it should be upheld to standards that match or exceed those of an upland landfill.

I believe that anything less aggressive than this would be a disservice to future generations and to the natural environment. The liner will eventually fail; it seems only a matter of when. It is certain that the sea level will rise with climate change; it is already rising. Exactly how much the sea will rise in coming years is unknown, but it seems prudent to plan for at least a modest rise that is in agreement with current climate and sea rise models. These models are published and publicly available if the Port is willing to do some research. The preferred plan by the Port is a 100 year plan, and it accommodates a 2.4 foot sea rise. This shows poor foresight. It is well within predicted

models that the sea will contact the current upland areas of the Cornwall site, and perhaps cover it entirely, within 100 years. I believe the plan should prepare for at least 500 years; which is still far from the visionary 1 in 10,000 year events that the Dutch plan for. If the job is to be done, we should make every effort to do it right the first time and to not leave a mess for just two or three generations in the future.

The marine environment is at stake as well, not in 100 or 500 years, but right now. There are many things we do not know about the effects of the dioxins already existing in Bellingham Bay, not even including the effects of potential leaching of the toxic sludge and waste at the Cornwall site. There is as yet no accounting for the bioaccumulation of dioxins and other toxins on the marine life in the bay and beyond, or of the effects this may have on humans who consume fish and crustaceans from the bay. There should be more studies addressing these questions.

Lastly, I would like to ask that the RG Haley site be considered separately from the Cornwall Landfill site. There are potentially different toxic wastes coming from this site, with different rates of groundwater travel and other leaching characteristics, and with different effects on the marine environment and human health.

I do not think a park without trees will be very aesthetic or very natural. I am not happy that there will remain a landfill on the edge of Bellingham Bay. I am saddened that the Bellingham shoreline, which in a past time had been so beautiful and bountiful, has been spoiled and poisoned. But I am willing to live with these things, because this is the world we have created for ourselves, and we are left only with the chance to do the best we can to keep it as safe and clean as possible from here forward. The cheapest alternative is not always the cheapest in the long run. Nothing less than Alternative 3 should be considered. I will also oppose any further dredging of toxic wastes, any further dumping of these toxic wastes along the shoreline, and any other environmental actions taken by the Port that slip by without adequate time for citizens to become informed and to make their voices heard. This is our bay. Many of us would like to continue to recreate in it, and to keep it a safe home for all, human, fish, and seal alike.

Sincerely,

Janiene Licciardi
2000 Harris Avenue
Bellingham, WA 98225

Adams, Mark (ECY)

From: Virginia Prowell [virginia@januscom.com]
Sent: Friday, September 20, 2013 9:03 AM
To: Adams, Mark (ECY)
Subject: Cornwall Clean Up

Dear Community Leaders of Conscience:
Please do what is considered common sense and morally correct - Stand up for the earth, the water, and land - we have defaced and raped our earth long and hard enough.
It is time to make amends for our immoral and lack of intelligence actions that have had damaging impact on the beauty and health of the environment which sustains us in food, drink, and soul.
Repair our damages and right the wrongs.

Thank you for your consideration of these concerns.
-
Virginia Prowell
Bellingham, WA

(32)

Adams, Mark (ECY)

From: Jonathan Schilk [flopalotofit@gmail.com]
Sent: Friday, September 20, 2013 10:23 AM
To: Adams, Mark (ECY)
Subject: Comment regarding Cornwall Avenue Landfill RIFS
Attachments: Cornwall Avenue Landfill Comment.pdf

Thank you for this opportunity to comment on the preferred option.

(3B)

DEPARTMENT OF ECOLOGY
State of Washington

Comment form

Cornwall Ave Landfill cleanup site public meeting

Aug. 28, 2013

Please fill out the comment form so we will have a record of your ideas and opinions. You may return it to any member of the Ecology project team or mail to the address on the back.

What is your interest in the cleanup project?

( ) Live near the cleanup site.
( ) Work near the cleanup site.
( ) Own or operate a nearby business.
(X) Interested citizen.
( ) Other: _____

How did you hear about this open house?

( ) Newspaper. If so, which one? _____
( ) Radio
(X) Mail notice
( ) Ecology website
( ) Friend, coworker, neighbor
(X) Other: Part of Bellingham

Email updates

Would you like to receive email updates about this project? If yes, please print your email address clearly:

flopalotofit@gmail.com

To share your contact information and give us additional comments, please see the back of this form.

DEPARTMENT OF ECOLOGY
State of Washington

Comments, questions or concerns

I prefer Option three because: it gives added protection (thicker liner and extends shoreline stabilization farther into the bay.) Option three has a more robust liner that will better resist intrusion of tree roots and inadvertent damage during park construction.

I also like diverting ground water seeps and other stormwater discharge from off site (near bluff) away from the landfill.

I would like the south shore line edge between the existing beach and then northwards along the beach to the first big turn in shoreline direction to the NE to include a finer textured surface treatment (sand, small washed rounded gravel). I think the preferred option ought to include this change to simplify park construction.

Contact information (optional)

Project website

www.ecy.wa.gov/programs/tcp/sites and search for the site name Cornwall Ave.

Mail completed form to

Mark Adams, site manager
Department of Ecology
3190 160th Ave. SE
Bellevue, WA 98008-5452

Or email comments to mark.adams@ecy.wa.gov.

Adams, Mark (ECY)

From: Steve Tuckerman [tosteve@mac.com]
Sent: Friday, September 20, 2013 11:07 AM
To: Adams, Mark (ECY)
Subject: Cornwall Avenue Cleanup RI/FS Comments

September 20, 2013

Dear Mr. Mark Adams,

The following are my comments on the Cornwall Avenue Landfill RI/FS. I live in the Bellingham Bay area and enjoy crabbing, fishing and kayaking on the bay. I am concerned about the highly toxic and bioaccumulative compounds at the site and their detrimental effects on aquatic and terrestrial organisms as well as human health. I recommend alternative 3 because it is more protective. The two layer upland cap and the groundwater diversion barrier will decrease water flow through the landfill thereby decreasing contaminant loading in the bay. The engineered larger underwater cap will improve isolation of the existing wastes. Bioaccumulation calculations, standards and monitoring requirements need to be established to ensure protection of the environment and human health. I am against alternative 4 because of the potential for dispersing even more of the waste material into the environment. Thank you for reviewing my comments.

Sincerely,

Jennie Tuckerman
881 Chuckanut Shore Road
Bellingham, WA 98229

34

Adams, Mark (ECY)

From: bearearl@q.com
Sent: Friday, September 20, 2013 11:20 AM
To: Adams, Mark (ECY)
Subject: cornwall cleanup: support for alternative cleanup #3

Mr. Mark Adams, Ecology Site Manager
3190 160th Ave NE
Bellevue, WA 98008-5452

To Mark Adams:

RE: Comments to RI/FS Report on Cornwall Ave cleanup site

Thank you for accepting these comments on the draft Cornwall Avenue Cleanup site RI-FS. As a long time resident of Bellingham I am very interested in the results of this cleanup process and the restoration of the Cornwall Ave Fill Site/Future Park. I would support the #4 alternative cleanup process, but I'm afraid the cost analysis would be too tremendous to accomplish. Therefore I will support the #3 cleanup alternatives for the following reasons.

#3 alternative provides a more secure containment cover by using a thicker 60 mil high durability polyurethane liner that can be welded together at the seams This heavy duty liner is also backed by a long life warranty (40 years). The 20 mil liner proposed in alternative #2 does not lend itself to welding due to its thinness. It would have to sew and tape each seam, which would probably leak and seep pollution.

I am a commercial fisherman and am quite concerned about the effect this landfill has on our crab, salmon, and local eel grass. Alternative #3 will provide greater control of heavy metals and dioxins from entering Bellingham Bay. The additional 12 inch (18 inch total) of sediment material/gravel mix will help control refuse and wood debris below 10 MLLW Mark. Also the upland diversion of ground water away from the landfill will reduce contamination from entering the bay.

Thank you for this opportunity to comment on the Cornwall Ave Cleanup Site RI-FS. I hope to see the implantation of the alternative #3 cleanup.

Sincerely,
Robert Earl-
Commercial Fisherman
Graduate Huxley College Environmental Studies
Marine and Terrestrial Ecosystem Analysis 1976

(35)

Adams, Mark (ECY)

From: ERIC JOHNSON [ej76mn@gmail.com]
Sent: Friday, September 20, 2013 11:22 AM
To: Adams, Mark (ECY)
Subject: Public comments for Cornwall Landfill

Mark, I trust your proposed efforts will protect the environment as stated, but I must say that as a resident a couple blocks uphill from the site, my preference is for complete removal. As a community, do we really want our future waterfront district built atop toxic waste? Let's start over and build this city in accordance with the values of most city residents; a clean and safe environment for all. I'm sorry this option is most expensive. Hopefully this cost will motivate us not to allow such irresponsible use of our resources in the future.
Eric Johnson
250 N State St, #207

(36

Adams, Mark (ECY)

From: Joseph Knight [pjknight@cablespeed.com]
Sent: Friday, September 20, 2013 11:33 AM
To: Adams, Mark (ECY)
Subject: Comment on the Cornwall Ave Landfill Cleanup Site

Dear Mr. Adams,

I am a resident of Whatcom County and someone who enjoys the waterside ambiance of Bellingham.

I have looked through the RI/FS Report on the Cornwall Avenue Cleanup Site. I am strongly opposed to Alternative 4, since this option is likely to disperse an unknown quantity and type of pollutants into the nearby waterways and, in effect, damage the very effort at containing the pollutants that exist in the landfill and in the nearby R.G. Haley site.

I strongly urge you to select Alternative 3. As these things go, the cost is only minimally more than Alternatives 1 and 2, and offers much greater safety to the immediate Bellingham Bay environment.

Ground water and surface water are better controlled in Alternative 3 than in Alternatives 1 and 2 -- all detailed in the RI-FS Draft document.

The much stronger 60 mil liner versus 20 mil in Alternatives 1 and 2 provides much greater safety and permanence to the landfill.

The difference in cost $10.7 million for Alternative 3 versus $9.1 million is relatively small given the risks from the unknown pollutants in the landfill itself.
It will eventually cost more than $1.6 million dollars difference to remediate a failed option and therefore I urge you to use the most robust alternative within financial reason.

The RI-FS Draft document also references the R.G. Haley site and suggests that similar remedial techniques will be used. While that is still an active study I think that the stronger, 60 mil liner offers much more safety when the total cleanup is evaluated.

Thank you for your attention.

Sincerely,

Joseph E. Knight
3880 Cabrant Road
Everson, WA 98247

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Adams, Mark (ECY)

From: Wendy Harris [w.harris2007@comcast.net]
Sent: Friday, September 20, 2013 11:37 AM
To: Adams, Mark (ECY)
Subject: Comment #1 on Cornwall Landfill RI/FS final cleanup proposal

To Mark Adams:

I support alternative four, off-site removal of toxins. I do not support alternatives one through three.

I would also support an alternative where the dioxin and refuse was dumped and contained at the ASB, or at a local off-site facility, on stable land, that could be used to dump waste from this project, and other MTCA projects.

Geological Hazard
I do not support on-site containment of any hazardous waste on fill in Bellingham Bay. This land is geologically hazardous, at high risk for seismic activity, liquefaction, lateral spreading, and erosion. It is located within a floodplain. Risk of water infiltration exists both above and below the property, from sea level rise and increased precipitation, which will result through global warming. Hazardous waste should not be contained on land subjected to on-going, and in some cases, abrupt stressors.

Priority Contaminates of Ecological Concern
In particular, terrestrial on-site containment is inappropriate on geologically unstable land which contains state "*priority contaminants of ecological concerns*", such as heavy metals (lead, mercury, silver, zinc, cadmium), capped by material containing dioxin, which is another priority pollutant of ecological concern. Priority pollutants of ecological concern have "*significant tendency...to persist, bioaccumulate, or be highly toxic to terrestrial ecological receptors.*" WAC 173-340-7494. It does not appear that the port or DOE have analyzed this issue in its review of the cleanup alternatives, although one would think that priority contaminants deserve special consideration and review.

Thus, when the port advises that some repairs might be necessary in a geologic event, but that there is no significant risk to human health, it is considering only immediate human mortality. It needs to consider risks to plant and animal life, and ecosystem function, which is not as easily repaired. Moreover, it needs to consider the long term risk to humans from bioaccumulation of priority contaminants released during a geologic event. Far too little emphasis has been placed on healthy ecosystem concerns, altbough a MTCA cleanup action is intended to protect the health of humans, *plants and animals*.

Terrestrial Ecological Evaluation
Based on these considerations, the port should be required to perform a terrestrial ecological evaluation pursuant to WAC 173-340-7490. Under the MTCA, a terrestrial evaluation is performed to determine whether a release of hazardous substances to soil may pose a threat to terrestrial environment; characterize existing or potential threats to plants and animals; and establish site specific cleanup standards for the protection of plants and animals.

The aquatic environment has been the subject of numerous studies and review, but little is known about the terrestrial environment. This is an important data gap to close for a MTCA cleanup involving on-site containment of priority contaminants of ecological concern, situated on geologically hazardous land.

The port has not conducted a terrestrial ecological evaluation based on a legal exemption provided for institutional controls. DOE has the authority to require a terrestrial evaluation through the discretion it is granted in applying MTCA provisions, such as those guiding institutional controls under WAC 173-340-440, or those allowing DOE to revise the bioaccumulative substances and concentrations standards under WAC 173-340-7494. The MTCA is intended to be enforced in a manner that prioritizes human, plant and animal safety. Because the terrestrial ecological evaluation will provide information that could affect analysis of the cleanup alternatives, it must be developed and reviewed before a final cleanup plan is selected.

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Summary

In sum, the unstable nature of the landfill cleanup site; the state priority for the handling of bioaccumulative toxins found on the site, and those being beneficially reused to cap the site; and the lack of terrestrial ecological information and analysis, indicate that cleanup alternatives one, two and three are not appropriate as proposed on the RI/FS.

At a minimum, a terrestrial ecological evaluation is necessary, and DOE needs to ensure that there is policy support for the beneficial reuse of dioxin on geologically hazardous land, as defined with the City of Bellingham Critical Area Ordinance, which is applicable to this site.

Sincerely,
Wendy Harris

Adams, Mark (ECY)

From: Wendy Harris [w.harris2007@comcast.net]
Sent: Friday, September 20, 2013 2:08 PM
To: Adams, Mark (ECY)
Subject: Comment #2 on Cornwall Landfill Cleanup

Dioxin

The preferred alternative results in on-site containment of hazardous waste, with capping materials that contain dioxin in levels that exceed safe exposure limits for unrestricted upland contact and open water disposal. The preferred cleanup alternative reflects the worst of all possible cleanup situations. It allows a final cleanup using technology that is not officially accepted by the state and federal government as safe and permanent.

No Beneficial Reuse Policy For Dioxin

DOE and the port would have the public believe that stabilizing dioxin with Portland cement and ash, and covering it with dirt and plastic sheeting affects a permanent cleanup solution. Were it this simple, dioxin would not be among the "dirty dozen" toxins highlighted in the Stockholm Convention, signed by 175 nations, for elimination, monitoring and disposal.

The U.S. has not ratified the Stockholm Convention. However, while the state and federal government allow beneficial reuse/containment of dioxin, *they will not officially approve it as a safe, permanent clean up method.* It is being done for expediency because there are no safe, affordable disposal technologies readily available.

DOE advised me that they have no official position regarding the beneficial reuse of dioxin. Is there any precedent for beneficially reusing dioxin as a construction material on a project site rated at high geologic risk? Will DOE issue official policy supporting the beneficial reuse of dioxin as a safe, permanent cleanup solution before this cleanup moves forward? Otherwise, the residents of Bellingham have become unwitting guinea pigs in a dangerous experiment.

Dioxin Solidification/Stabilization (S/S) Inadequate As Permanent Technique

The EPA allows dioxin site contaminants to be capped, but not as a permanent solution because of questions regarding long term viability. The capped dioxin is to be re-examined every two years in the hope that eventually technology will yield an economically practical method of removing and decontaminating the soil.

Most information on the EPA site relies upon information from a 1991 dioxin treatment study. Dioxin Treatment Technologies; U.S. Congress, Office of Technology Assessment. OTA-BP-O-93, 1991. It said the following:

> Historically, the physical and chemical bonding involved in complex stabilization reactions has not been rigorously researched and understood by most practitioners. Many view S/S treatments as "low tech, no-tech, or pseudo-tech." More damaging, however, is the fact that claims by certain vendors on the successful application of their particular techniques are largely unsubstantiated. The long-term effectiveness of S/S treatment has always been surrounded by uncertainty. Among the factors contributing to this are: the difficulty of determining what actually occurs under field conditions; the difficulty of reproducing in the laboratory the role played by S/S materials in soil and waste; the potential for cement bonding to be retarded by contaminants; and the varying nature and size of soil particles at contaminated sites. Heat produced by the reaction between S/S chemicals and the waste may also induce the volatilization of organic compounds.

As far as I am aware, there is no field studies that establish the long term safety and effectiveness of dioxin stabilization. As stated above, there are uncertainties introduced by relying on limited lab testing. It is believed that dioxin stabilization slows down the mobilization of dioxin through the containment materials into the environment, but it does not prevent it. In other words, it is not a permanent cleanup solution.

The preferred cleanup solution relies upon S/S technology, a dirt and sand cap, and plastic sheeting that is seamed and has a limited useful life. The on-site containment is sited on geologically hazardous land. Under these facts, the preferred

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alternative reflects non-permanent technology for a cleanup intended to be permanent. The question is not whether the dioxin will mobilize into the environment, but when. This is not adequately protective of the safety of humans, plants and animals.

Health Impacts Worse than Considered

Adding to these concerns, every updated study or review indicates that dioxin is more dangerous than believed, and that state exposure standards need to be reduced to protect against the risk of cancer, and other dangerous diseases. Dioxin accumulates slowly over a lifetime, through the process of bioaccumulation. The current exposure standards under state law need to be revised to conform to updated science.

A recent and long overdue EPA draft on dioxin health impacts found that the cancer risk to humans from dioxin exposure was by far the highest defined for any chemical by any government agency anywhere in the world. Levels of dioxin-like compounds found in the general population may cause a lifetime cancer risk that is 1,000 times higher than EPA's generally acceptable risk level. Analyses by the Environmental Working Group show that consuming EPA's proposed reference dose for dioxin over time would result in an incremental dose of the carcinogen that would be 270 times greater than what EPA considers acceptable for the general population. This updated information regarding increased danger of dioxin was not included in the analysis conducted for this RI/FS, and therefore, does not sufficiently protect public health and ecological function.

It has been argued by some, including DOE, that dioxin levels can not, or should not, be reduced below background exposure levels because this results in environmental standards that are impracticable and unnecessarily expensive. That has a certain logic until you realize the no level of dioxin exposure is safe, and that each episode of dioxin exposure during our life is cumulative, increasing the totality of the health risk as we age. Moreover, in this project, the appropriate "background" standard should be the level of dioxin that existed on the site before the cleanup. The Cornwall Landfill was one of the few waterfront MTCA cleanup sites that was not contaminated with dioxin. Therefore, the cleanup should not result in any amount of dioxin being contained on-site.

I do understand the concerns and expenses involved in off-site removal. However, it was unwise to introduce a new, and more hazardous, contaminant to the MTCA site during the interim action, and the dioxin contaminated sediment needs to be removed and disposed of in a safe and permanent manner. It is important to take a policy stand now, at one of the first waterfront development sites, to ensure that more beneficial reuse of dioxin is not incorporated into the cleanup and development of other waterfront sites.

Misleading Statements Regarding Dioxin

DOE and the port failed to inform the public that the interim action involved dredged sediment contaminated with dioxin. Now, it is misleading the public, by providing a false sense of safety regarding this toxin. No safe exposure level exists for dioxin, and it is important for people to limit cumulative exposure episodes and to understand that every additional exposure episode increases lifetime risk for cancer, and damage to immune system and reproduction system.

I have heard repeated reference to the fact that the dioxin contaminated sediment that will be used in the cap is only a "little bit" contaminated. This is misleading and it undermines the purpose of imposing state exposure standards. Dioxin is measured in parts per trillion, so no amount in excess of state exposure standards in insignificant (although here it was measured at more than double the exposure standards in certain areas). Exposure standards are the result of extensive scientific study and mathematical calculation, and either you meet the standards, or you do not. And we already know that exposure standards are not sufficiently protective against cancer and other disease.

DOE and the port need to be more forthcoming and less cavalier in discussing dioxin levels in cap materials, and the cumulative impacts of bioaccumulation. At this point, I do not believe that sufficient information has been provided to the public to allow informed comment and decision.

Please remove the dioxin contaminated sediment from the site. This leaves only cleanup alternative four as a viable option, unless additional cleanup options are considered.

Sincerely,
Wendy Harris

Adams, Mark (ECY)

From: Wendy Harris [w.harris2007@comcast.net]
Sent: Friday, September 20, 2013 2:42 PM
To: Adams, Mark (ECY)
Subject: Comment #3 on Cornwall Landfill RI/FS

Cost/Benefit Analysis Issues

Externalization of Cost It is troubling that the port was allowed to externalize its operating costs onto the general public through the MTCA process. This distorts the purpose of the MTCA and provides an inappropriate financial benefit to the port.

The port is required to engage in routine dredging to maintain navigability. The cost of the dredging is a normal operational cost. When the Gate 3 sediment was deemed to be too contaminated for inexpensive open water disposal, the port proposed the interim action, which was in expensive way for the port to dump the dioxin on city owned land.

Were the port not provided this special privilege, DOE would not be considering a clean-up alternative that involved the use of contaminated capping materials. Dioxin contaminated materials are not appropriate for on-site containment for all the reasons set out in my prior Comments #1 and #2.

DOE needs to go back to the cost/benefit analysis and re-determine the cost of capping based on clean sediment. We need to have at least one option that includes the use of clean capping materials.

Was the cost of dredging, cleaning and transporting the Gate 3 sediment included in the cost/benefit analysis? Because unless the costs of obtaining the dioxin contaminated sediment is incorporated into the cost analysis, then it will unfairly favor the on-site containment options over the off-site removal options.

Lummi Treaty Rights

I have reviewed the comment letter by the Lummis and I believe that they raise a valid point regarding treaty rights and consideration of site history. They are legally entitled to have a healthy ecosystem restored in partial satisfaction of their treaty rights. Additionally, under the updated 2013 COB SMP, applicable to this action, the Lummis are co-managers of the site's water resources. It is clear that DOE and the port have coordinated with COB, the other water resource co-manager. Failure to include the Lummis in coordination for the site cleanup is an inexcusable oversight.

This will require a substantial reworking of DOE's standard cost/benefit analysis. I suggest this be taken seriously because the Lummis hold treaty rights that will affect the cleanup and development of the entire Bellingham Bay waterfront, so it is an issue that has extensive implications.

Given the policy considerations and the amount of revision that will be required, I suggest that DOE rescind the RI/ pending additional analysis and discussion with the Lummi.

Sincerely,

Wendy Harris

(4D)

Adams, Mark (ECY)

From: Wendy Harris [w.harris2007@comcast.net]
Sent: Friday, September 20, 2013 3:19 PM
To: Adams, Mark (ECY)
Subject: Comment # 4 Cornwall Landfill

Comprehensive Planning

The preferred cleanup alternative, and the RI/FS in general, was developed without consideration of coordinated, comprehensive planning. In doing so, DOE has ignored the science based recommendations that were developed specifically for Bellingham Bay cleanup and development. To maximize effectiveness, cleanup plans should be developed based on an integrated, comprehensive approach. Many of the issues that exist on the cleanup site can not be effectively handled through a piecemealed and site-specific approach that has been adopted.

The Bellingham Bay Comprehensive Strategy, which includes the cleanup and development of the Cornwall Landfill (currently posted on DOE's website), recommends; 1) comprehensive, ecosystem based analysis and; 2), integrated development of cleanup plans, zoning and land use, and habitat restoration. This is the approach that should be adopted for the Cornwall Landfill cleanup. A great deal of effort was put into developing the Comprehensive Strategy and no good reason exists to avoid these recommendations, other than shoddy analysis and an attempt to save money.

And this comprehensive approach was highlighted as appropriate for the Cornwall Landfill in DOE's own materials. DOE Publication 04-09-112 states:

> The Cornwall Avenue Landfill site is one of several cleanup sites identified in the Bellingham Bay Comprehensive Strategy, a bay-wide guidance document issued in 2000. The Comprehensive Strategy integrates sediment cleanup, control of pollution sources, habitat restoration and aquatic/shoreline land use on a bay-wide scale. https://fortress.wa.gov/ecy/publications/summarypages/0409112.html.

Every clean up alternative developed for the Cornwall site, including the preferred alternative, fails to adopt these recommendations. As such, none of the cleanup alternatives maximize effectiveness, and the RI/FS should be revised to reflect an integrated and comprehensive analysis.

Until then, the following types of problems will exist:

Commingled Contamination

Cornwall Landfill shares overlapping areas of contamination with two other sites, the RG Haley site (commingling of soil, sediment and groundwater contamination) and the Whatcom Waterway (commingled sediment contamination). (Draft RI/FS, pages 1-2 and 1-3). While some coordination with the RG Haley site is reflected in the RI/FS, these are still essentially separate cleanups that are proceeding on separate timelines.

This is contrary to DOE policy, which requires consolidated cleanup strategies for cases of commingled contamination. This is the best way to address the issued created, such as commingled plume, workloads, sequencing, timing, etc. It also results in a higher level of accountability, by preventing different consultants, contractors and agencies from pointing fingers and shifting blame to other as a means to avoid public transparency and accountability.

An exception was allowed in this case through restriction of the hazardous substances on the Cornwall site that were considered part of this cleanup action. The site cleanup was restricted to refuse and wood waste. That is unacceptable as it does not provide the most timely and thorough form of cleanup. It is not in the public's interest to continue to piecemeal and parcel out site cleanups to protect the port's financial interests. The Cornwall Landfill cleanup should include all site contaminants, including the commingled plume, and other wastes coming from RG Haley and Whatcom Waterway.

Waterfront District Sub Area Plan

DOE and the port are proceeding with cleanup before the land use plans have been determined. This introduces uncertainty into the cleanup process and does not allow the best cleanup solution to be customized based on the land use

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development that will occur. It is not possible to even determine appropriate cleanup levels without knowing the future site land use. As a result, remedial action objectives reflected in the RI/FS are not clear and certain. The public needs to be provided certainty in reviewing the RI/FS and the preferred cleanup alternative, and it has not been provided with adequate information. This cleanup action should be determined after the waterfront plan is adopted, and in coordination with a comprehensive conservation strategy for habitat, connectivity and biodiversity.

Wendy Harris

Adams, Mark (ECY)

From: Wendy Harris [w.harris2007@comcast.net]
Sent: Friday, September 20, 2013 3:25 PM
To: Adams, Mark (ECY)
Subject: Cornwall Landfill wildlife issues

The RI/FS fails to reflect updated analysis of fish and wildlife issues, and therefore, is not in compliance with local and state substantive requirements. The Waterfront EIS, including the addendum for the current plan, does not even address plant and animal impacts. The information contained in the RI/FS is so outdated, it is not accurate regarding ESA species. Since the information relied upon by DOE, several species of rockfish were added to the ESA, which may reside in Bellingham Bay, as reflected in WDFW reports and review by Fed. Depart. of Commerce.
Moreover, NOAA is attempting to add to the ESA not just rockfish species, but rockfish habitat, which would include Bellingham Bay. The public comment period on this new provision does not expire until November 2013, but could have substantial impact on the shoreline work and dredging that in being included in the cleanup plan. The NOAA draft specifically references the harmful activities by the port of Bellingham in dredging and developing shoreline.

The Cornwall Landfill analysis needs to consider rockfish species and habitat, as well as issues of biodiversity and habitat connectivity that can not be addressed on a site specific basis. As proposed this does not meet no net loss requirements under state and local law.

Wendy Harris

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Adams, Mark (ECY)

From: Wendy Harris [w.harris2007@comcast.net]
Sent: Friday, September 20, 2013 11:54 PM
To: Adams, Mark (ECY)
Subject: Comment #5, Public Process and Inadequate Info for Cornwall Landfill RI/FS

Public Process Concerns and Inadequate Information

A 30 day comment period is inadequate for a RI/FS of such length and complexity, particularly where the port and DOE have taken years to develop and address complex cleanup issues. If DOE was concerned about meaningful public participation, it would not have unnecessarily limited response time. What timeliness concern justifies provision of the minimal comment time allowed under the law?

The RI/FS fails to reflect information crucial in determining the adequacy of the cleanup. This undermines the public's right to comment. For example:

- Final cleanup levels are not determined and instead "preliminary cleanup levels" are reflected. What is the point of public comment when cleanup levels have not been determined?
    - What legal authority allows the use of preliminary cleanup levels?
    - Does this mean that cleanup levels are subject to change without public input?
    - How will the public be informed regarding changes in preliminary cleanup levels?
- Performance standards for soil may include institutional controls. Specific actions are defined in other sections of the report, but the location of these provisions remains unspecified, leading the public unclear on what is referenced.
- Reasonable and available methods of groundwater treatment for the remedial alternative are undefined.
- A biological assessment will be required for USACE review in permitting the selected cleanup remedy. Why isn't this biological assessment required earlier, subject to public review? DOE is relying upon outdated ESA information that fails to include some ESA species. Little information is available regarding terrestrial habitat, habitat connectivity and biodiversity. The public is unable to determine if the cleanup plan protects plants and animals.

The public is told about the general standards that must be achieved, but not the specific methods that will be used. Without specific information regarding the methods of meeting cleanup standards, the public is unable to determine the adequacy of the proposal. Examples include:

- Technologies and remedial alternatives must be "flexible" enough to accommodate virtually any type of planned land use since the waterfront district sub area plan is still being reviewed.
- Institutional controls are "carried forward as a remedial technology for further evaluation."
- Compliance monitoring is carried forward for further evaluation.
- Shoreline stabilization technologies are carried forward as remedial technologies for further evaluation.
- Monitored natural recovery is carried forward as remedial technology for further evaluation.
- Removal and off-site disposal of contaminated sediment is carried forward for further evaluation.

The public needs to be provided with final cleanup standards and information regarding specific actions that will be taken in meeting cleanup standards. Updated wildlife and habitat information is needed to determine if plant and animal species are being protected. Until this information can be reflected in the RI/FS, the Cornwall Landfill should not move forward.

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Sincerely,
Wendy Harris

Adams, Mark (ECY)

From: Laura Brakke [llbrakke@hotmail.com]
Sent: Friday, September 20, 2013 3:24 PM
To: Adams, Mark (ECY)
Cc: Randel Perry USACE; Terpening, Dustin (ECY)
Subject: Comments on Cornwall Ave Landfill clean up

To: Mark Adams- Site Manager Dept of Ecology
Re: Comments on the draft environmental report

Thank you for taking my comments into consideration in your continued review of plans for site clean up and future uses of the Cornwall Ave landfill site.

I would like to echo the Lummi nation and their concerns. Certainly the history of this site goes further into the past than sawmill operations. This site must be respected for the long history of sustainable fisheries that Native people participated in and protected. This site must be adequately cleaned up to once again restore this site to habitat that will again sustain and protect our valuable marine resources and ecosystem.

I would agree that the preferred cleanup option is a total removal of all contaminants. Leaving this toxic soup of contaminants within the shoreline jurisdiction, one of the most sensitive and unstable areas seems absolutely ludicrous. To make matters worse, in 2011 the port placed more dredged material with heavy metals, dioxin, PAH's, furans, phthalates, and ammonia on top of the contaminated soils capping it with a waterproof material. This toxic sediment must be removed from the shoreline.

To accomplish the preferred cleanup goals of protecting human health and the environment this sediment and waste products must be removed.
I have a plan to accomplish this; BNSF railroad is currently sending fully loaded coal cars through this site and on the return the empty cars could be loaded with this sediment and toxic waste, the waste can be taken to drier climates. The open pit mines in Wyoming are just crying out for a beneficial reuse solution. Line those pits with this husky material, far away from fish, marine habitat, and land that would be subject to earthquakes and flooding. Cap it with more mine tailings and more liners or whatever seems appropriate for the site. The rail cars, over 120 per train times 4 a day and perhaps more, could quickly eliminate the dredged soil from the Squalicum Marina and much of the landfill and wood waste. This should be very cost effective as the trains return empty and there could be little cost to bear. This idea has merit and should have further examination.

I am not sure what agency came up with the idea of creating a Park out of a toxic waste site, but these uses are mutually exclusive. There is no scientific rationale that would put families into an area so toxic that the cost of transporting it to a safer place is prohibitive. This site must be restored to a functioning habitat for salmon, eelgrass, crab, ground fish and all the species native to Bellingham Bay. Creating a functional ecosystem that restores productive habitat is also mutually exclusive with a Park for humans, dogs, and recreational activities. I am asking for a sensible plan, either it is a toxic waste depository in the worst place imaginable for a toxic waste depository, or it is a place that is going to have a true restoration of it's previous productive habitat or it becomes a Park for humans. There is no way it can be all three.

This waterfront clean up is complicated and will be costly, but the goal is to get environmental pollutants out of the shoreline area which is very sensitive and unstable in many ways. Please take the time and energy to

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do this right this time. Remove those mounds.

I would also like to comment on how difficult it is for the general public to comment on projects this size. The length of time and amount of information that is required to make constructive comments is beyond the scope of a working person. Therefore, do make the mistake that through lack of participation there is an implied agreement with this plan. It is most certain that citizens would be horrified to know the Dept of Ecology, the Port, and the City of Bellingham are proposing a Park to be sited on top of mounds of covered known carcinogens.

Please take my comments into consideration when you forge ahead with a true clean up, not a cover up.

Thank you,

Laura Leigh Brakke
585 Pleasant Bay Rd
Bellingham, WA 98229

Adams, Mark (ECY)

From: Helen Brandt [helenbrandt@comcast.net]
Sent: Friday, September 20, 2013 3:30 PM
To: Adams, Mark (ECY)
Subject: Bellingham Waterfront Project

Mr. Adams:

The Port of Bellingham is currently contemplating "Alternative 2," which proposes to cap the historic landfill with dioxin-contaminated sediment from Squalicum Harbor and cover over the cap with a thin scrim liner.

I want the dioxin-contaminated sediment and hazardous landfill contents removed from the waterfront and placed in a landfill for hazardous waste. I do not want the material "capped."

Future earthquakes, tidal overwash, or sea level rise could disperse the dangerous material. I want a waterfront that is safe for future generations of humans and wildlife.

Helen Brandt
Bellingham

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Adams, Mark (ECY)

From: mmknight mmknight [mmknight@broadstripe.net]
Sent: Friday, September 20, 2013 3:32 PM
To: Adams, Mark (ECY)
Subject: Comments on the Draft RI/FS for the Cornwall Ave Landfill cleanup site

To: Mark Adams, Site Manager
Department of Ecology
190 160th Ave, NE
Bellevue, WA 98008-5452

mark.adams@ecy.wa.gov

From: Margaret M. Knight
3880 Cabrant Rd
Everson, WA 98247

mmknight@broadstripe.net

Subject: Comments on the Draft RI/FS for the Cornwall Ave Landfill cleanup site

Concerns

My comments stem primarily from the containment of contaminants from the uncharacterized refuse from the landfill and the intrusion of contaminants of potential concern from the RG Haley site onto the Cornwall site.

Containment of landfill contaminants

There are Preliminary Cleanup Levels (PCLs) proposed for sediment and for groundwater listed in Section 8.0 - "Discussion of Cleanup Standards" and the corresponding tables 8.1-8.3.

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The sediment PCSs listed in Table 8-2 are for copper, silver, zinc, bis(2-ethylhexyl)phthalate (sometimes referred to as BEP in the document), and PCBs. The contaminants cadmium, lead, and carcinogenic PAHs are expected to be adequately reflected by the PCB analyses. Metals have quite different characteristics than do the PCBs. ***The advisability of using PCBs to reflect trends for cadmium and lead is questionable. Separate testing of cadmium and lead should be done.*** There might be a practical problem with bis(2-ethylhexyl)phthalate. It's ubiquitous and a very common laboratory contaminant leading to a high potential for false positives.

The groundwater PCLs consist only of manganese and NH_3-ammonia. The reasoning behind this is in Table 8-1. There is only one exceedance of screening criteria for other contaminants in the samples tested, copper at 2.6 ppb. The levels look as if they are reasonably developed; however, only testing groundwater for these two constituents leads to an important problem with the "Cleanup Levels" for soil.

No PCLs exist for soil. The reason for this is explained in 8.1.1 and is, essentially, the soil will be either contained (Alternatives 1-3) or removed (Alternative 4). If contained, the VOCs will be addressed by the gas control system, so no PCLs for soil are expected to be necessary.

> (8.1.1) All of the cleanup alternatives developed in the following section [Section 9.0 (Feasibility Study)] address the contaminated soil/refuse/wood waste either by completely removing it or by isolating it from the environment. As a result, cleanup levels protective of direct contact, leaching, and erosion are not necessary, and have not been established
>
> The development of soil cleanup standards typically includes consideration of the vapor migration pathway if VOCs are present in soil. However, because the Site contains refuse and wood debris that will continue to generate low levels of methane for many years, landfill gas (LFG) control will be an element of any Site cleanup action that includes containment. As a result, any VOCs present in Site soil will be addressed by the methane gas control system, which will eliminate the soil vapor as a potential exposure pathway for the Site. Consequently, soil cleanup levels protective of the vapor migration pathway were not developed for the Site.

Farther on in 8.1.1 is the statement

> ...***The determination of the adequacy of soil cleanup will be based on the remedial action alternative's ability to comply with groundwater cleanup standards for the Site***, to meet performance standards designed to minimize human or environmental exposure to affected soil, and to provide practicable treatment of affected soil. Performance standards to minimize human and environmental exposure to affected soil may include institutional controls that limit activities that interfere with the protectiveness of the remedial action.***(my italics)***

There is no provision testing the effectiveness of the bolded part of the statement in 8.1.1 when the only contaminants monitored in the groundwater are manganese and NH_3-ammonia.

We don't really know what is in the refuse/wood waste because it hasn't been characterized. The landfill area is extremely non-homogeneous and difficult to characterize and it makes sense to

assume that the landfill is indeed contaminated and monitor the groundwater for contaminants occurring from any landfill leachate appearing in the groundwater to test the effectiveness of the cleanup. Down-gradient groundwater is only being tested for NH_3-ammonia and manganese. In chemical analysis, it is generally true that you cannot detect what you are not "looking" for. An analysis for NH_3-ammonia, for example, won't give information on a leaking corroded barrel of waste oil. ***The down-gradient groundwater should be tested for the appearance of previously unknown constituents. This should not be a one-time analysis after "completion" of the cleanup but part of a routine, periodic monitoring to continue to verify landfill containment. Monitoring should include searches for organic compounds <u>not</u> on the screening lists.*** A suggestion would be to use standard RCRA determinative methods from SW-846 such as the current revisions of 8260 and 8270 for organics, and to use 6020 for metals, all with their associated appropriate preparation methods. The organic analyses should include screens for unknowns (referred to as "tentatively identified compound" or TIC screens.)

Inclusion of acute and chronic toxicity testing with appropriate saltwater organisms might also provide additional information serving as early warning and assurance that the marine environment is returning to a healthy state.

RG Haley

The document makes it clear that the major source of contaminants originate and continue to flow from the RG Haley site. It is imperative that there is close coordination between these sites to eliminate fingerpointing, one side to the other, with the potential that responsibility is not taken by either side and to avoid the potential for further spread into the Cornwall Avenue Landfill site. It would have been best to treat at least the overlap area and the RG Haley site as a continuous area. Perhaps these areas could be mitigated simultaneously.

Preferred Option

I support Alternative 3 over the RI/FS preferred Alternative 2 because of the attempt to better control upland runoff/groundwater, the higher protection, longevity, and ruggedness of the 60mil HDPE versus 20mil scrim reinforced geotextile, and a deeper cap on the sub-tidal region. The increased cost of Alternative 3 over Alternative 2 seems minor in comparison with the increased potential for cap failure and for percolation of runoff/groundwater percolating through the landfill area with the associate cost of mitigation.

Although the fourth alternative seems on the face of it to be the most permanent and best choice, beside the increase in cost due to the cleanup there is a substantial danger of acute toxic release

when the essentially uncharacterized landfill is physically disturbed. This is potentially a greater danger than a slow, very low level release.

Respectfully submitted,

Margaret M. Knight, PhD

Adams, Mark (ECY)

From: bobburr@comcast.net
Sent: Friday, September 20, 2013 3:33 PM
To: Adams, Mark (ECY)
Subject: Clean-Up options for Cornwall Landfill

As a concerned Bellingham resident, grandfather and candidate for City Council, I have some comments on the draft proposal for the Cornwall Avenue Cleanup Site. While I would prefer Option 4, I agree that it does not pass cost benefit analysis. On the other hand, I do believe that Option 3 provides added protective benefits vs. Option 2 at a cost which is worth it.

The 20-mil dura-skrim liner which is part of Option 2 simply is insufficient. It is very difficult to weld and is below the standard used by most landfills, even in less ecologically sensitive areas. At a minimum, the 60 mil liner proposed in Option 3 and which is the accepted industry standard should be used. If I had my druthers, I would prefer you actually go to 80 or 100 mil. Alternative 3 with its additional 12" of sediment material is also better than Alternative 2 for the marine clean-up.. I also believe the groundwater diversion that is in Option 3 but not in Option 2 to be necessary.

Whatever course of action is taken, some further study is required IMHO. I have a huge concern over bioaccumulation and you appear to have punted on this issue. I eat fish three times a week and many of my friends in the Lummi Nation feature fish as the staple of their diet. Please provide site specific standards that address the bioaccumulation of chemicals such as lead, mercury, cadmium, dioxins/furans, PAHs and PCBs.

You have treated removal and cover up as an either-or. Could you please price out the possibility of a mixture of the two. I am most concerned about the sludge dumped on the site from the Harbor dredging. How much additional cost and improved benefit would result from just its removal.. Similarly. what would be the cost and benefit of removal of the just the marine refuse and wood debris.?

The 2004 Waterfront Futures Plan provided for more marine habitat protection than this plan. Why the retreat?

The clean-up of this portion of the waterfront cannot be considered in a vacuum. It must be considered in concert with the rest of the Waterfront Development site,, particularly the adjacent RG Haley space.

Finally, remember that the Lummi Nation shares stewardship of this land. To avoid one more broken promise, there absolutely needs to me Lummi signoff on the plan.

Without wax,

Bob Burr

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Adams, Mark (ECY)

From: Galen Herz [gmherz@gmail.com]
Sent: Friday, September 20, 2013 3:45 PM
To: Adams, Mark (ECY)
Subject: RE: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

Dear Mr. Mark Adams,

Thank you for accepting these comments on the Draft Cornwall Avenue Cleanup Site RI-FS. As a resident of Bellingham I am very interested in the results of this cleanup process, and I look forward to watching the overall waterfront redevelopment process move forward. After reviewing all of the proposed alternatives for the cleanup site at Cornwall, I prefer Alternative 3 for the following reasons: Alternative 3 provides a more robust sediment cap for the contaminated site with a thick liner that is easier to weld together for a high quality seal and has a longer life expectancy than the liner proposed in Alternative 2. Alternative 3 proposes using a 60-mil High Durability Polyethylene liner, which is the standard liner used by the Landfill industry. It would last significantly longer than the 20-mil dura-skrim liner proposed in Alternative 2, which does not have a substantial life expectancy and is difficult to weld for a proper seal to prevent water infiltration. I am concerned that the liner material proposed for Alternative 2 will fail to serve its intended purpose and therefore I would feel safer visiting this new park and beach with the thicker (60-mil) liner in place.

I am also concerned about the effect of the landfill on the fish, crabs, and other animals that use the bay. I prefer Alternative 3 for the marine cleanup because it includes an additional 12" (18" total) of sediment material which is meant to isolate and contain the refuse and wood debris below the 10 MLLW mark, whereas alternative 2 has just a thin layer of sediment below 10 MLLW and it won't isolate the garbage from the landfill. Alternative 3 also includes up-gradient groundwater diversion to reduce groundwater flow through the site to reduce the amount of contaminants that get into the bay, but Alternative 2 does not.

Thank you for the opportunity to comment on the Cornwall Avenue Cleanup Site RI-FS. I look forward to being able to visit and enjoy Cornwall Beach with the knowledge that my family and I are not being exposed to harmful contaminants.

Sincerely,

Galen Herz

1347 Franklin Street, Belllingham, WA, 98225

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Adams, Mark (ECY)

From: Mary Elizabeth Bell [meb645@gmail.com]
Sent: Friday, September 20, 2013 3:53 PM
To: Adams, Mark (ECY)
Subject: comment on the Cornwall Avenue Cleanup study

Mr. Adams,
The "cleanup" proposal currently under consideration by the Port of Bellingham, "Alternative 2," is unacceptable. It does not actually clean the site, and in fact might make it dirtier. It should be obvious that sediment from Squalicum Harbor, contaminated with a well-known highly toxic carcinogen, dioxin, should not be used for anything, but should be removed. Please, we need a cleanup alternative that actually cleans.
Thank you,
Mary Bell
616 Bayside Road
Bellingham, Wa 98225

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Adams, Mark (ECY)

From: Alex Chadsey [achadc88@hotmail.com]
Sent: Friday, September 20, 2013 4:10 PM
To: Adams, Mark (ECY)
Subject: Cornwall Avenue Landfill Cleanup comment submission
Attachments: comment Draft Cornwall Avenue Cleanup Site RI.docx

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Thank you for accepting these comments on the Draft Cornwall Avenue Cleanup Site RI-FS. As a life-long resident of Bellingham want to ensure that the cleanup process is as thorough as possible and I look forward to watching the overall waterfront redevelopment process move forward. I support Alternative 3 because it is most protective. In my opinion, it is the option that serves as the baseline for what the cleanup should look like; anything else would simply fall short in terms of making this habitat productive again, both ecologically and anthro-centrically.

I believe this site should be restored so it once again can provide healthy habitat areas. I am concerned about the level of habitat protection in the current plan. According to the City of Bellingham's Shoreline Master Program (SMP), there should be, "no net loss of ecological function." However, capping may impact the eelgrass grass beds located below the proposed shoreline stabilization system. Eelgrass beds provide critical habitat and prevent erosion. I feel very strongly about monitoring this aspect of the cleanup. Please ensure that the public has a voice in reviewing the capping design and mitigation plans for eelgrass.

The SMP also says that native vegetation should be established to restore ecological functions andecosystem wide-processes. The RI/FS says that, "the surface cover of topsoil would support re-vegetation," of the upland site. Please install vegetative corridors along the shoreline and from the shore to the upland. Ecosystem benefits from native vegetation would include: the protection of plant and animal habitats, providing food sources for aquatic and terrestrial species, reducing accelerated erosion, and providing habitat corridors parallel and perpendicular to the water body. The RI/FS also says that the site "may not provide quality habitat for significant plant or animal species, [but] a steep and forested hillside is located east of the Site and east of the BNSF railroad tracks, which could potentially provide limited habitat for the plant and animal species." The addition of a vegetative corridor from the water to upland would provide connectivity that would benefit many species.

Though this forsaken piece of intertidal land may seem insignificant, it was once a piece of the tapestry of life for the native peoples of this area. For generations upon generations our bay provided sustenance and sanctuary, and it shall once again do so; the only question is whether it will be a few generations ahead of us that reap the benefits of our hard work, or will we pinch pennies and literally stitch together a solution when we could have something far better for a fraction of the price more, perhaps ensuring the land remains poisoned for much longer. Think of the seventh generation. Think about how they will reflect on the actions of their ancestors. I will hope that history remembers us as the generation that finally began cleaning up the ecological disaster that was our forefather's industry, or else you can be assured that our children will take up that mantle and look at us with disdain for our petty complacency.

Thank you for considering my comments. I hope that my participation in this public comment period will help lead to positive improvements to the RI/FS and the addition of habitat enhancement in Cornwall Landfill cleanup plans.

Sincerely,

Alexander Chadsey

Adams, Mark (ECY)

From: GOODMAN, TIMOTHY (DNR)
Sent: Friday, September 20, 2013 4:52 PM
To: Adams, Mark (ECY)
Cc: Clark, Dennis (DNR); RECHNER, MICHAL (DNR)
Subject: Cornwall RI/FS Public Review Draft
Attachments: DNR Cornwall Comment Letter RIFS-9-20-13V3.pdf

Mark,
I hope you are having a great vacation. Please find attached DNR comments on the August 16, 2013, Public Review Draft of the Cornwall Avenue Landfill Remedial Investigation/Feasibility Study. I proper hard copy is in the mail.

Tim Goodman
DNR
360-902-1057

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WASHINGTON STATE DEPARTMENT OF
Natural Resources
Peter Goldmark - Commissioner of Public Lands

Caring for
your natural resources
... now and forever

September 20, 2013

Mark Adams
Toxics Cleanup Program
Washington State Department of Ecology
3190 160th Avenue SE
Bellevue, WA 98008-5952

Re: Comments on the Cornwall Avenue Landfill Remedial Investigation/Feasibility Study Public Review Draft Dated August 16, 2013

Dear Mr. Adams:

The Washington State Department of Natural Resources (DNR) appreciates the opportunity to comment on the Cornwall Remedial Investigation/Feasibility Study (RI/FS) Public Review Draft dated August 16, 2013. We want to compliment the Department of Ecology on the quality of their technical oversight of the RI/FS and the movement forward towards a protective remedy. The 2012 supplemental groundwater investigation was particularly valuable in assessing long-term point of compliance performance.

As steward and proprietary manager of State-owned aquatic lands (SOAL), a portion of which have been degraded by historical practices at this site, you can depend on our continued cooperation in partnership with the City of Bellingham and Port of Bellingham as we work together to clean up the site.

DNR supports the preferred alternative. The conclusion that Alternative 2 is the best remedial action is based on many years of applied sound science performed in coordination with DNR and other agencies. Although full removal of contamination from SOAL is an ideal to which DNR strives, we recognize the significant challenge of selecting a remedy that costs many times more than the preferred alternative while providing relatively few incremental net benefits.

For over 20 years DNR has commented on and helped guide remedial investigation activities at the Cornwall Avenue Landfill Site. This has included active participation in the Bellingham Bay Action Team, formal comments, and agreements. The DNR 2003 memoranda addressing an earlier version of the RI/FS promoted a soft bank technology. The DNR letter of January 10, 2008, which provided comments on the 2007 draft version of the RI/FS, identified critical data gaps.

In April 2007, DNR entered into an interlocal agreement with the Port of Bellingham that defined future remedial responsibilities including cost sharing obligations at the Cornwall Avenue Site. DNR agreed that the remedial plans, as approved by Ecology, met regulatory requirements. DNR also agreed to provide appropriate use authorizations for monitoring, caps,

and other cleanup-related structures without fee. The Port, in turn, agreed to perform the remediation.

DNR will continue to manage SOAL impacted by the remedy in accordance with DNR State Aquatic Lands Management Laws, and the Washington State Constitution Articles XV, XVII, XXVII (RCW 79.100 through 79.140; WAC 332-30). The management of state-owned aquatic lands is intended to provide a balance between:

- Encouraging direct public use and access,
- Fostering water-dependent uses,
- Ensuring environmental protection, and
- Utilizing renewable resources.

DNR appreciates the extensive discussion in the RI/FS of the need for coordination of remedial actions at the Cornwall Avenue Landfill Site with those at the R.G. Haley Site to the north. The appropriate, repeated recognition that key R.G. Haley remedial actions will need to precede (or occur simultaneously with) most if not all of the major Cornwall remedial actions argues strongly for accelerating the RI/FS for R.G. Haley to "catch up" with that for Cornwall. While DNR does not want to see remedial action at Cornwall delayed, we are concerned – as we think all parties are – about the challenges of proceeding with Cornwall cleanup when R.G. Haley contaminants overlap the northern end of the former site.

DNR will work with its partners, the City of Bellingham and Port of Bellingham, through the remedial design process to look for opportunities to minimize loss of eelgrass and maximize habitat value.

Please continue to involve DNR in the Department of Ecology decision making regarding the cleanup, including the remedial design phase.

Thank you for taking time to consider DNR comments. Please feel free to contact me if you have any questions.

Best Regards,

Tim Goodman, P.E.
Environmental Engineer

cc: Dennis Clark, Field Assistant Division Manager, Aquatic Resources Division
Brian Gouran, Environmental Site Project Manager, Port of Bellingham
Amy Kraham, Environmental Remediation Project Manager, City of Bellingham

Adams, Mark (ECY)

From: Sandy Robson [sjrer2@yahoo.com]
Sent: Friday, September 20, 2013 4:52 PM
To: Adams, Mark (ECY)
Subject: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

Mr. Mark Adams, Ecology Site Manager
3190 160th Avenue NE
Bellevue, WA 98008-5452
VIA E-MAIl : mark.adams@ecy.wa.gov

To: Mr. Mark Adams
Thank you for accepting my comments on the Draft Cornwall Avenue Cleanup Site RI-FS. As a resident of Whatcom County, I am very interested in the results of this cleanup process, and I look forward to watching the overall waterfront redevelopment process move forward.

First, I want to state that I would hope and expect that the very highest level of cleanup be conducted at the Cornwall Ave. cleanup site. If alternative 3 is the highest level of cleanup possible then that is what I support, because it is most protective, but I also want to make sure habitat in this area is supported. I thought there was a possible alternative to remove the polluted and contaminated material and cart that away from the site altogether. That is what I most prefer, but it is not clear to me if that is still a choice for this cleanup. If it is, then that is what I prefer. If it is not still an alternative, then alternative 3 would be my next best choice.

I believe this site should be restored so it once again can provide healthy habitat areas. I am concerned about the level of habitat protection in the current plan. According to the City of Bellingham's Shoreline Master Program (SMP), there should be, "no net loss of ecological function." However, capping may impact the eelgrass grass beds located below the proposed shoreline stabilization system. Eelgrass beds provide critical habitat and prevent erosion. I feel very strongly about monitoring this aspect of the cleanup.

Please ensure that the public has a voice in reviewing the capping design and mitigation plans for eelgrass. And, not just a voice, but a voice that is carefully considered. Sometimes it seems like a voice is given to the public on issues in the city of Bellingham and Whatcom County, but the public's comments and wishes are largely ignored as if the elected officials are simply honoring the idea of public comment, but not then considering it in their determination.

The SMP also says that native vegetation should be established to restore ecological functions and ecosystem wide-processes. The RI/FS says that, "the surface cover of topsoil would support re-vegetation," of the upland site. Please install vegetative corridors along the shoreline and from the shore to the upland. Ecosystem benefits from native vegetation would include: the protection of plant and animal habitats, providing food sources for aquatic and terrestrial species, reducing accelerated erosion, and providing habitat corridors parallel and perpendicular to the water body. The RI/FS also says that the site "may not provide quality habitat for significant plant or animal species, [but] a steep and forested hillside is located east of the Site and east of the BNSF railroad tracks, which could potentially provide limited habitat for the plant and animal species." The addition of a vegetative corridor from the water to upland would provide connectivity that would benefit many species.

Please consider the plan to create a beach on the southwest end of the cleanup site, as visioned by the Waterfront Futures Group (in 2004), and include small excavations in that area to make a pocket beach. This would increase habitat for intertidal organisms and provide additional recreation opportunities.

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Thank you for considering my comments which I hope will help lead to positive improvements to the RI/FS and the addition of habitat enhancement in Cornwall Landfill cleanup plans.

Regards,

Sandy Robson
email: sjrer2@yahoo.com
Birch Bay, WA. 98230

Adams, Mark (ECY)

From: hglid@comcast.net
Sent: Friday, September 20, 2013 7:38 PM
To: Adams, Mark (ECY)
Cc: hglid@comcast.net
Subject: Cornwall Avenue Waterfront Cleanup

Dear Sirs:

I wish to express my opposition to the current proposal for the development of the Cornwall Avenue waterfront.
The dumping of a large quantity of Dioxin-contaminated soil on top of what is already a municipal waste site has made a bad situation much worse and compromises the site for development as usable open space. I find it hard to fathom that a layer of plastic and soil cap will ensure a safe and stable area for use as a public park. This approach was taken as a half-measure to save money and does not represent a viable long-term solution to the contamination problem. Over time, the soil will become infused with water from the Bay, runoff or erosion and environmental damage will result. The current cleanup scheme does not give promise of a safe area for public use. If the area is developed as proposed, I will not use it and I suspect many other Bellingham residents feel the same. The only responsible approach is to remove the contaminated soil and debris and place it in an approved landfill for hazardous material. Once this is done clean fill can be introduced and the area made safe for use as a public park. If the Port wants the Bellingham public to support its development plans for the former GP site it should start the development process in a responsible way. The current "solution" to the Cornwall Avenue waterfront is a compromise not worth having.

Sincerely,

Hal Glidden
419 Briar Rd
Bellingham, WA
98225

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Adams, Mark (ECY)

From: helen g [hmg4600@gmail.com]
Sent: Friday, September 20, 2013 8:53 PM
To: Adams, Mark (ECY)
Subject: Bellingham's Waterfront Project

Dear Mr Adams,

I am sending this comment to you since you gave the remedial waterfront presentation on Aug 28, 2013. Thank you for the information. It is my understanding that today is the deadline for public comments regarding the environmental report produced by the Port of Bellingham with the Washington State Department of Ecology regarding the proposed plans for development of Bellingham's waterfront.

The cleanup proposed in this report for those land areas contaminated in previous years by pollutants and hazardous waste, such as the Cornwall parcel, appears short sighted. Information is readily available regarding possible events (climate related, tidal, shoreline erosion, earthquake induced changes, leaching toxins, etc.) that could compromise the cleanup proposed. This, as well as common sense, tells us that a "band-aid" type of cleanup is woefully inadequate in the long term. The work needs to be done correctly now so that additional remedial cleanup will not have to be done in the future as it would be even more costly then.

We can not afford to have the public exposed to toxins. Safety of our citizens should be of paramount importance. Our community needs the highest level of cleanup. Please find out what other communities faced with a major toxic waste cleanup did to remedy their situation successfully. Please take another hard look at the waterfront plans. We need a clean waterfront.

Thank you,
Helen Glidden
hmg4600@mail.com

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Adams, Mark (ECY)

From: borsope@aol.com
Sent: Friday, September 20, 2013 9:28 PM
To: mark.adams@ecy.wa.gov.
Subject: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

CORNWALL CLEANUP: Support for Alternative #3 Cleanup

Mr. Mark Adams, Ecology Site Manager
3190 160th
Bellevue, WA 98008-5452
September 20, 2013

To: Mr. Mark Adams
RE: Comments to RI/FS Report on Cornwall Avenue Cleanup Site

Thank you for accepting comments on the Draft Cornwall Avenue Cleanup Site. I am very interested in seeing a complete cleanup of this area for the safety of the residents and the health of the habitat for the life in the bay.

I understand this is not an option. Barring complete removal and clean up. I would support Alternative 3 which would offer more protection for the water and land with a thicker liner. I understand that Alternative 3 will offer a thicker layer of sediment as well to isolate and contain the landfill materials which may offer more protection.

Thank you for the opportunity to comment on the Cornwall Avenue Cleanup Site. I look forward to being able to visit and enjoy Cornwall Beach with the knowledge that my family and I are not being exposed to harmful contaminants.

Sincerely,

Pam Borso
P O Box 154
Custer, Wa 98240

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Adams, Mark (ECY)

From: Wendy Steffensen [wendys@re-sources.org]
Sent: Friday, September 20, 2013 11:57 PM
To: Adams, Mark (ECY)
Subject: Cornwall comments
Attachments: Cornwall Ave Landfill_092013.docx

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Wendy Steffensen, Lead Scientist
North Sound Baykeeper Team
RE Sources for Sustainable Communities
2309 Meridian St.
Bellingham, WA 98225

360 733-8307 (office)
360 739-5518 (cell)

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RE Sources
for Sustainable Communities

2309 Meridian Street • Bellingham, WA 98225 • (360) 733-8307 • fax (360) 715-8434 • resource@re-sources.org

Mr. Mark Adams, Ecology Site Manager
3190 160th Avenue NE
Bellevue, WA 98008-5452
[Via e-mail : mark.adams@ecy.wa.gov]

Date: September 20, 2013

To: Mr. Mark Adams

RE: Comments on RI/FS Report on Cornwall Avenue Cleanup Site

RE Sources is a non-profit environmental education and advocacy organization. Our mission is to conserve natural resources through recycling, education, advocacy, and the conservation of natural resources. We are home to the North Sound Baykeeper Program and we represent over 800 members who are concerned about water quality and healthy habitats. It is in this capacity, that we present you with our concerns on the Cornwall landfill RI/FS and cleanup project.

During the comment period for the Cornwall Avenue Landfill, we appreciated the help offered to us by Ecology and Port staff to get information requested and to explain some issues which were unclear. Mark, you were very clear and straight-forward at the public meeting. During your time away, Dustin Terpening at Ecology was very helpful and promptly posted relevant information to the ftp site. Brian Gouran at the Port was also very helpful and fielded many technical questions and even attended a community meeting on the cleanup, to help answer audience questions.

As many members in the community, as well as we at RE Sources have found, the length of the comment period is simply too short to meaningfully digest all of the issues and make thorough comment. Many community members did not know about the comment period until some weeks after it started. The small group of scientists we worked with, who started early in the comment period to read and digest the RI/FS, were still coming up with questions on the document this week. We request 60 day comment periods for cleanup-related documents from hereon in.

While there is still much in the RI/FS to digest, we at RE Sources have read the document, done some initial research, and have come to some conclusions about the proposed cleanup. As well, there are unresolved issues which we will also detail in this letter.

Letter from the Lummi Nation on the Cornwall Ave Landfill RI/FS, September 13, 2013: RE Sources agrees with the Lummi Nation that the disproportionate cost analysis (DCA) does not reflect the cost saved by the City of Bellingham and others to dump garbage at the Cornwall Landfill, rather than shipping it to a different upland site. It also does not reflect the cost of the past and ongoing damage to the ecosystem. Even though accounting for these very real damages is not the usual way that Ecology conducts the DCA, these damages should not be ignored. We ask that Ecology work with the Lummi Nation to revise the DCA to account for the cost-savings already accrued to the City of Bellingham and others and for past and ongoing damages to the ecosystem.

The information garnered from this DCA may make Alternative #4, full removal, the most cost-effective. If this is the case, Ecology will need to further elucidate the technologies for removal and any associated risks with exposing or disturbing the refuse. At present, these topics are given minimal attention.

RE Sources Preferred Alternative: Give the available information, RE Sources prefers Alternative #3, with some caveats.

Liner: The liner in Alternative #3 is preferable. It is much sturdier and will last for a longer period of time. As Lee First, our Pollution Prevention Specialist and former landfill technician has found out through research and personal experience, the 60 mil liner is the industry standard for landfills and it can be easily welded. The 20 mil liner cannot be easily welded, but must be sewn or taped, making holes and leakage through the liner more likely. In conversation with Port representatives, it appears that the thought was that the 20 mil liner was sufficient due to the low permeability of the dioxin waste layer. If the dioxin waste liner remains on site, we still do not think a 20 mil liner is sufficient. Firstly, although the dioxin waste layer is proposed to represent a low permeability cap, its permeability is not zero. Water can permeate the liner and cap, potentially dislodge dioxin bound particles, allowing dioxin to enter the marine environment. Water could alternatively seep through the liner, and run along the dioxin cap, entering the landfill along a preferred seepage pathway, carrying landfill contaminants with it. Secondly, as Ecology construction and industrial stormwater inspectors advise permittees, redundancy is a desirable feature when combatting rainfall and stormwater. The first barrier may not work; use two.

Groundwater Diversion Barrier: The groundwater diversion barrier proposed in Alternative 3# would increase the diversion of groundwater from 73 to 98%. This is very significant. In protecting the community and environment from landfill contaminants, water is the enemy. Landfills are often cited in Eastern Washington, to minimize their exposure to rain. Certified landfills have leachate collection systems in order to collect and treat contaminated runoff. For the Cornwall Landfill, we have one of the worst possible situations, even in its upland portion. We are in northwest Washington with heavy frequent rains and we do not have the ability to collect leachate. For this upland portion, we must keep as much water out of the landfill as possible to minimize leaching. This is especially important given the relatively unknown composition of the refuse. Thus, the components that will be leached out of the landfill are also relatively unknown, as this variety of materials found at the site illustrates:

- "Information in DNR files indicates that Frank Brooks Manufacturing Company (Brooks) dumped oil at the Cornwall site after the closure of the landfill (RETEC, 1997). Brooks held leases on the landfill area and the DNR-managed portion of the Site. The files indicate that DNR considered Brooks' actions to be "unauthorized and unconstitutional." Furthermore, DNR considered legal action to force Brooks to stop this activity and to cover the dumped oil. The dumping of oil at the Cornwall site by Brooks is of particular concern because Brooks treated wood in the

Bellingham area. Brooks historically used both creosote and PCP to treat wood." (RG Haley Preliminary draft RI/FS, Geoengineers 2007).

- "An isolated area of nonaqueous product was observed in the central portion of the Site, near the northern corner of the former main GP warehouse that appears to be unrelated to the sheen observed in the northeastern portion of the Site. During the supplemental RI, a black, highly viscous liquid that had a similar appearance to Bunker C fuel oil was observed at RITP-12. The material was 2 to 4 inches thick and was contained within a wood structure located above the water table at about 4 ft BGS. The excavation exposed a portion of the wooden structure about 3 ft by 3 ft. The extent of the wooden structure was unknown because it was left intact and backfilled with the excavated materials. A sample of the black liquid was collected and allowed to sit overnight in an open container under a vented hood. By the next morning the liquid had dried to a hard, brittle material that appeared to be a plastic. As such, the black viscous material does not appear to be a petroleum hydrocarbon product and its composition is unknown." (Public Review Draft, Cornwall RI/FS, August 2013, Landau)
- "The Site came to public attention in 1992 when a beachcomber reportedly discovered medical waste (including glass blood vials and plastic syringes) along the beach at the toe of the landfill." (Public Review Draft, Cornwall RI/FS, August 2013, Landau)

In- water sediment cap: The landfill and wood debris are not isolated in the water. Thus, there is a significant risk to organisms in the marine environment, and subsequently to humans who may consume contaminated seafood. To protect these organisms and humans, we recommend that a full isolating cap be instituted. It is not clear, however, that 18" is sufficient. Nor is it clear that it is engineered. Please explain.

We have overlain sediment deposition results over Figure 3-1 to see if there are any erosional zones that may necessitate thicker or different capping. (I note that there were erosional zones, evidenced in sediment deposition off of the ASB in the Whatcom Waterway RI/FS that now have to be addressed by armoring, although the overall deposition rate in the Bay is 1.2 cm/year). Please review the pattern of deposition rates to assess where and what type of capping would be best suited to this area. There appears to be a cluster of sites surrounding CW-26 that does not support high sediment deposition rates.

It appears that the 18" depth of the cap, corresponding to approximately 45 cm, is what may be necessary to accommodate upper- and mid-level bioturbation. (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). This 18" cap, thus does not account for any erosional layer on the top, nor any isolation layer at the bottom. A cap of 18" only makes sense if we assume that erosion is not occurring. The data are somewhat mixed on this issue. Overall we know that erosion is occurring; the shoreline has eroded away to a great extent, many tens of feet according to the RI/FS. Despite the fact that we know that erosion is occurring, we have data showing that there is some sedimentation occurring as well. Please reconcile the erosion and sedimentation information along with the choice of an 18" cap.

Dioxin Waste Layer Upland Cap: As an addendum to Alternative #3, we believe that the dioxin cap should be removed. Dioxin is a waste material and is not appropriate as a cap, itself being a contaminant. We do acknowledge that the dioxin waste in this cap is relatively low and fairly immobile, at present. We object to its use on the following grounds.

1) The theory and practice of beneficial reuse of waste materials has not been discussed on a community-wide basis. This should occur before the cap becomes permanent and before any other such re-use is allowed.

2) The possibility of inundation by storm surge, tsunami, and sea level rise has not been adequately addressed. In fact, the dioxin waste layer may not be high and dry; it is being used to increase the grade

level of the site in preparation for sea level rise. (Interim Action Plan, 2011, Landau). Tests of the dioxin waste cap have not been conducted under long-term saturated conditions and this reuse of waste material is untested. If indeed, sea level rise is 28" (the Port's estimate) or 50" (the upper estimate of found in Ecology and CTED. 2006. Impacts of Climate Change on Washington's Economy: A Preliminary Assessment of Risks and Opportunities), then the dioxin containing sediment will be saturated. Tests under saturated conditions are necessary. Under high sea level rise scenarios and more frequent storms, might the cap material break apart and release dioxin containing sediment into the environment on a large scale? Tests to assess the bioavailability of this dioxin-containing sediment should also be conducted.

Soft Bank/ Beach: As a second addendum to Alternative 3#, we support a beach at the southern edge of the Cornwall Landfill site, as do many community members. The RI/FS states that soft-shore technologies will be looked at during remedial design. This, however, is one of those issues that should not wait for a design phase where the public cannot comment and where learned experts cannot review. We support either a cut out to support a beach as outlined in the Waterfront Futures Group Final Workshop Report (Anchor and Coastal Geologic Services, 2004) and City of Bellingham Shoreline Master Program Restoration Opportunities (2013) or a soft shore bank as shown in the preliminary Cornwall RI/FS draft (2009). We understand that neither of those ideas may be tenable due to the risk of either excavating the landfill or from erosion of the site (see earlier comment on "in-water sediment cap"). We believe that the information used to make those decisions must be made public and go through a formal review process because this is such an important value for the community.

Wood Waste: The rationale used to develop the criteria for wood waste are unclear. I asked for the citations explaining the wood waste criteria and was given an e-mail simply re-stating the criteria. I assume that I will get the rationale for the criteria after Mark Adams returns from vacation. Prior to Ecology accepting the wood waste criteria as is, I believe Ecology should explain the criteria and accept comment on it. I am curious about the criteria, in part, because it is very different than one used at the Scott Paper Mill (Cleanup Action Plan, May 2009) Here, Ecology conducted sediment bioassays to develop "site-specific cleanup levels for wood debris content and total volatile solids (TVS)" protective of sediment habitats. "Based on interpretation of the available biological data, surface sediment TVS levels greater than 12.2 percent(dry weight basis) and/or wood debris levels greater than 25 percent (by volume)were identified as having the potential for site-specific deleterious effects exceeding SQS biological criteria." Why were no such tests conducted at Cornwall Avenue Landfill? It seems that the only way to circumvent these tests is to cap the wood waste entirely, with an engineered cap.

Bioaccumulative Toxins: In Section 5.2, potential receptors are listed. These list recreation visitors and fishers, but they do not list subsistence fishers and pregnant women and children who eat fish. These vulnerable populations should be considered. In setting appropriate cleanup levels, we ask that you use fish consumption rates that reflect reality, rather than those in statute.

Bioaccumulative toxins of concern include cadmium, lead, and carcinogenic PAHs and PCBs. Yet, only the "Preliminary Cleanup Level" is listed for PCBs. The text says that these others **may** be developed in the Cleanup Action Plan. Since the RI/FS is the place where the preferred alternative is chosen, we believe that the cleanup levels should be put on the table now. Could these cleanup levels alter the alternatives or alter the cost of the alternatives? At a community level, could information about the cleanup levels shed light on the wisdom of the various alternatives? Additionally, we request that cleanup levels be developed for all of the toxins mentioned, unless it can be shown that the chemical are co-located and that using the PCB level is the most protective. In a quick review of table 6-4, it showed that where lead was high PCBs were not. This leads me to believe additional levels should be set, at least for the organics and metals.

Preliminary Cleanup Levels: This terminology does not make sense to me. Why are these preliminary? The public should be able to weigh in on the cleanup levels, not something that can change.

Dioxin: There were virtually no analyses for dioxin in the sediment and soil. Given the proximity of RG Haley, I believe dioxin, a frequent contaminant of pentachlorophenol, should have been analyzed. What was the rationale not to analyze for dioxin?

Shoreline Master Program (SMP): While the cleanup is not required to get permits under the SMP, it is supposed to comply with the SMP substantively. Here are a few sections which we feel apply most closely to the proposed work:

1) Under SMP: 22.08.040: Critical Saltwater Habitats, the code says that there should be no net loss of ecological function. Because capping may impact eelgrass, we are hopeful that you will consider replacing any eelgrass that is lost.
2) Under SMP 22.08.100: Shoreline Native Vegetation Management, the code says that native vegetation should be established to restore ecological functions and ecosystem wide-processes, such as, protecting plant and animal species and their habitats, providing food sources for aquatic and terrestrial species, reducing erosion, and providing habitat corridors parallel and perpendicular to the water body. We would like to see the Cornwall Landfill site replanted with native vegetation both along the shore and from the shore to the upland to provide these vital functions.
3) Under SMP 22.09.80: Recreational Development, the code says that recreational development is preferred if it does result in a net loss of ecological function. In this, case, while the area is pretty degraded, it can function as a wildlife corridor in the absence of people. In consultation with wildlife biologists, we have confirmed that many terrestrial animals have been found in the area and some use the site. In order for people and wildlife to co-exist here, we believe that a vegetated connection to the wooded hillside between the Landfill and the Interurban Trail could be designed as a corridor. The species that would likely use this site include river otter, long-tailed weasel, short tailed weasel, mink, striped skunk, black tailed deer, raccoon and opossum.

Cost Benefit Analysis: We find the cost-benefit analysis to be a very subjective tool. We believe that the benefits of protecting people and the environment over the long-term greatly outweigh the associated costs. We note that the CBA only looks at 20 years of maintenance and monitoring. We ask you to recalculate the costs to 100 or 150 years, when sea level rise has occurred and when a number of liners have been degraded and replaced. Public opinion also seems to be very disinclined to Alternative #2, and I look forward to seeing this reflected in the recalculation of the DCA.

RG Haley: We are very concerned with the contamination from the RG Haley site. The RI/FS states: Contamination at the site that appears to be associated with the R.G. Haley site will be addressed during cleanup of that site, although cleanup activities for the two sites will be coordinated to ensure that Cornwall Site cleanup does not preclude any remedial actions that may be selected for the R.G. Haley site, and vice versa. (Public Review Draft, Cornwall RI/FS, August 2013, Landau). This does not seem sufficient, given the overlap of the sites. We ask that they be cleaned together to preclude re-contamination of either site. Since both property owners are willing, this seems the best and most effective course of action at this point.

Characterization concern: From the RI/FS: "An isolated area of nonaqueous product was observed in the central portion of the Site, near the northern corner of the former main GP warehouse that appears to be unrelated to the sheen observed in the northeastern portion of the Site. During the supplemental RI, a black, highly viscous liquid that had a similar appearance to Bunker C fuel oil was observed at RITP-12. The material was 2 to 4 inches thick and was contained within a wood structure located above the water table at about 4 ft BGS. The excavation exposed a portion of the wooden structure about 3 ft by 3 ft. The extent of the wooden structure was unknown because it was left intact and backfilled with the excavated materials. A sample of the black liquid was collected and allowed to sit overnight in an open container under a vented hood. By the next morning the liquid had dried to a hard, brittle material that appeared to be a plastic. As such, the black viscous material does not appear to be a petroleum hydrocarbon product and its composition is unknown." (Public Review Draft, Cornwall RI/FS, August 2013, Landau). I read this paragraph over a few times and then I had to read it to others. I, and many others, think that Ecology should direct the consultant to go back and find out what the mystery liquid is. How many other unknowns lurk in the landfill? This incident really shows the necessity of full containment of the refuse by isolation or removal.

Monitoring: Please see Margaret Knight's comments on the utility of monitoring ammonia and manganese in the groundwater to assess containment of soil refuse. I find her statement on the issue to be very well-considered and I support it whole-heartedly.

Earthquake and tsunami risk: These two subjects were barely mentioned. The risk from these should be addressed in the RI/FS stage, before an alternative is selected. The risk from these events could alter the public's desired alternative as well as the anticipated costs for infrastructure and monitoring.

Thank you for considering our comments. We look forward to Ecology responding to our concerns and the concerns of others in the community.

Sincerely,
Wendy Steffensen
Lead Scientist,

On behalf of the North Sound Baykeeper Team and RE Sources