

Enclosure

EPA'S POSITION FOR SCREENING OUT THE ALTERNATIVE TO SITE, DESIGN, AND CONSTRUCT A CONFINED DISPOSAL FACILITY ("CDF") FOR DISPOSAL OF CONTAMINATED SEDIMENT FROM THE ARKEMA REMOVAL ACTION

Overview of CDF Issue

Arkema asserts that EPA inappropriately screened out disposal of dredged contaminated sediment in a CDF in its May 2007 Work Plan. Arkema argues that limiting the Engineering Evaluation/Cost Analysis (EE/CA) analysis to either disposal in an off-site landfill or an on-site landfill creates a presumptive remedy. They argue that limiting the alternatives to landfill disposal is inconsistent with EPA Sediment Guidance which discusses selecting cleanups that are site-specific and project-specific. EPA's position is that the Arkema removal action needs to focus on only the most qualified, known technologies and reasonably available disposal options to assure protective, prompt action and early risk-reduction. EPA's rationale for this position is based on the facts of this site and is consistent with the NCP and EPA guidance. More specific rationale for EPA's position follows:

The EE/CA Should Assess Only the Most Qualified Technologies to Assure Protective and Prompt Action

The contaminated sediments at the Arkema facility presents a significant risk to human health and the environment and include some of the "principal threat materials" (PTM) for the Portland Harbor Superfund site. The Portland Harbor Remedial Investigation/Feasibility Study (RI/FS) Round 2 Report identifies the Arkema facility as containing the highest DDx concentrations, including concentrations above 10,000 micrograms per kilogram [$\mu\text{g}/\text{kg}$], in the study area. Excluding evaluation of a CDF for the Arkema for these highly contaminated sediments is consistent with EPA guidance concerning removal and treatment of PTM¹. Page 33 of the referenced guidance states the following: "Whenever practicable, the alternatives selection process should consider the CERCLA preference for treatment over conventional containment or land disposal approaches to address the principal threat at a site. Although CERCLA section 121(b) appears to apply only to remedial actions, the overall strategy scheme leads to the conclusion that this preference is also an appropriate goal for removal actions." The CERCLA preference for treatment, applicable to the Arkema site, reflects the need to select an alternative which will be most effective in the long-term. The same guidance also states, "...only the most qualified technologies that apply to the media or source of contamination should be discussed in the EE/CA," and "a limited number of alternatives, including any identified presumptive remedies, should be selected for detailed analysis." The rationale behind this approach is that, by limiting the number of alternatives brought forward for detailed analysis to a few most qualified technologies, EPA can speed the process of implementing the selected removal action.

¹ *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA*, U.S. Environmental Protection Agency, EPA540-R-93-057, August 1993.

Considering the length of time it has taken to develop a Work Plan for the EE/CA at the Arkema site, including an evaluation of a CDF would further delay the project due to the many steps needed in such an evaluation, as described in the June 27, 2005 Statement of Work (SOW) for the removal action. The SOW included the following paragraph: "If the proposed disposal technology is an on-site near shore Confined Disposal Facility (CDF), the design documents will include fill closure approach, hydrogeologic and contaminant transport evaluation for the fill, static and seismic stability analyses, filling approach, consolidation analysis, and screening of other potential sources of material for the CDF." These numerous steps, and others, including treatability studies, consideration of Land Disposal Restrictions and high Arkema area sediment DDx levels, development of performance standards for the CDF, as well as time for groundwater and river modeling, would further delay this project, especially when added to an already complex assessment of dredging methodologies (e.g., mechanical dredging with containment compared to hydraulic dredging), transportation planning, storage facility planning, debris removal issues and river access issues that are inherently part of the EE/CA for this removal action. Although evaluation of a CDF may have been initially contemplated in the SOW, there was no presumption that this alternative could not, or would not, be screened out. Given the length of time it has taken to get this far in the EE/CA process, further delays in the Arkema early action project now threaten to compromise cleanup sequencing for the whole of Portland Harbor given the expected Record of Decision (ROD) in 2010. Prompt implementation and compatibility with the sequence of work for the site-wide remedy is a legitimate reason to screen out an alternative.

One can assess the time delay associated with an Arkema site CDF by reviewing the status of the CDF proposed for the Portland Harbor T-4 site. CDF construction at the T-4 site cannot yet be practically implemented; however, the applicable design requirements (ARARs and performance standards) for the T-4 facility would apply at Arkema as a minimum. Given the additional site complexities at Arkema, CDF design under the EE/CA, including necessary treatability studies to meet performance standards, would introduce unacceptable delays to the removal of some of the worst DDx "hot spots" in the Willamette River.

The National Contingency Plan ("NCP") (40 CFR Part 300), Indicates the Importance of Prompt Action for Removal Actions

The NCP at Section 300.415(b)(4) identifies the need for an EE/CA and sampling plans for removal actions, like the planned Arkema removal action, where a planning period of at least six months exists before on-site activities must be initiated. The NCP defines the EE/CA simply as an "analysis of removal alternatives for the site". The NCP also stresses the need for prompt action in the section that precedes the EE/CA description, Section 300.415(b)(3), which notes that "If the lead agency determines that a removal action is appropriate, actions shall, as appropriate, begin as soon as possible to abate, prevent, minimize, stabilize, mitigate or eliminate the threat to public health or welfare of the United States or the environment." This section of the NCP also describes community involvement requirements associated with the EE/CA and removal action.

Evaluation of a CDF on the Willamette River Will Require a Great Deal of Time and Resources

The environmental footprint of a CDF would extend well into the Willamette River, affecting the ecosystem, river flow, flooding potential, and river traffic. Assessing these impacts would require a good deal of study and time. The impacts connected with the dewatering, treatment (as needed) and transportation facilities associated with the Arkema sediment removal action will also need to be assessed but, these present a far smaller in-river footprint, if any, and will not require the time and resources that evaluation of a CDF would require.

EPA Guidance Defines a Streamlined EE/CA Document

EPA Publication 9360.0-32FS (December 1993), entitled "Conducting Non-Time Critical Removal Actions Under CERCLA" elaborates on the EE/CA and public involvement requirements within the NCP. The guidance notes that "an EE/CA serves an analogous function to, but is more streamlined than, the remedial investigation/feasibility study (RI/FS) conducted for remedial actions." The guidance notes that "once the removal action scope, goals, and objectives have been identified, a few relevant and viable removal alternatives should be chosen for evaluation and comparison. Removal alternatives should be analyzed for their effectiveness, implementability, and cost." These three criteria were intended to allow a more streamlined assessment of a few alternatives than the nine criteria assessment associated with final remedial action alternatives in a RI/FS.

In addition, the 1993 guidance and the NCP both elaborate on the terms "effectiveness" and "implementability". The guidance states that "Effectiveness can be evaluated in terms of protectiveness and ability to achieve removal objectives" and that the "implementability of the alternatives depends on their technical feasibility, the availability of necessary resources to support the alternatives, and their administrative feasibility."

The terms "effectiveness" and "implementability" are discussed in greater detail in the NCP, under section 300.430, which governs the RI/FS and remedy selection process (for remedial actions). Worth noting for the Arkema site is that the NCP's definition of "implementability" for remedial actions is: "This criterion focuses on the technical feasibility and availability of the technologies each alternative would employ and the administrative feasibility of implementing the alternative. Alternatives that are technically or administratively infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time may be eliminated from further consideration." Given that alternatives involving facilities that do not exist may be eliminated from consideration in final remedial decision-making, eliminating evaluation of a CDF at the Arkema site for this removal action is reasonable. Proceeding without a CDF is especially pertinent considering the very difficult, time consuming process likely to be part of the siting, design and construction of a CDF at the Arkema site and the treatability studies required to determine whether and what level of treatment would be required to dispose of the Arkema dredged material in it. In summary, for this removal action, a CDF is not "implementable" within a time frame that is reasonable.

EPA Proposals for the Arkema Removal Action are consistent with EPA's "Contaminated Sediment Remediation Guidance for Hazardous Waste Sites" (2005) and OSWER Directive 9285.6-08, "Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites" (February 12, 2002)

Both EPA guidance documents describe 11 principles for making risk management decisions at contaminated sediment sites. Although these documents focus on large remedial actions, EPA's desire to complete the EE/CA and act promptly on the Arkema sediment removal action is consistent with the guidance document principles to the extent that they are applicable to the DDx hot spot under consideration in this removal action. For example, Principle #1, "Control Sources Early" and Principle #2, "Involve the Community Early and Often" are key considerations in this removal action. The Arkema dispute letter of February 19, 2008 is incorrect in referring to EPA's decision to remove a CDF from consideration at this site as contrary to these guidance documents. The EE/CA approach includes the need to evaluate alternative types of dredging methodologies, conduct appropriate site-specific river studies, and target areas to be remediated based on the risks posed by Arkema area contamination, and all of these considerations are in harmony with the Agency guidance. By excluding the CDF from further consideration, EPA is following the guidance within these documents, especially when they are viewed in concert with other EPA guidance documents and the NCP, which indicate that initiating the removal response as promptly as possible is the correct approach for this site. This leads to the conclusion that a CDF is not implementable in a reasonable time frame.

The Portland Harbor Community Advisory Group (CAG) Opposes the Use of a CDF for the Arkema Site

The CAG chairperson, Jim Robinson, said at the February 13, 2008 meeting that the CAG opposes evaluation of a CDF at the Arkema site as part of this early action. The CAG has also written to EPA in the past expressing its opposition to the CDF proposed for the Portland Harbor T-4 site. There was significant public concern about a CDF at Terminal 4 (see information provided in Attachment A to this Statement). It is expected that there would be as much if not more public opposition to a CDF at the Arkema site for Arkema waste.

Conclusion

Based upon these and other factors, it was reasonable and not arbitrary or capricious to screen from further consideration the siting, design and construction of a CDF for the Arkema site removal action.

EPA'S POSITION REGARDING THE USE OF RISK-BASED SCREENING LEVEL VALUES (SLVs) FOR THE ARKEMA REMOVAL ACTION

Overview of SLV Issue

EPA listed and used several risk-based criteria, defined as SLVs, in the Arkema Work Plan. The focus of much of the discussion of SLVs in the Work Plan was 1000x the lowest SLVs based on bioaccumulation in fish tissue with subsequent consumption by anglers and Probable Effect Concentrations (PECs) based on direct contact with contaminated sediments by ecological receptors as the basis for defining the Removal Action Area (RAA). The text of the work plan describes specific SLVs as appropriate.

Arkema disagrees with the use of any SLVs, as “clean-up standards” for the Arkema sediments EE/CA for three reasons. First, LSS suggests that the agreed upon language for how SLVs would be used, e.g., “for purposes of evaluating dredging and judging the effectiveness of the removal” does not mean they are cleanup values. LSS, however, does not articulate specifically what it meant by those words. Second, LSS opines that use of SLVs as clean-up standards is counter to the Joint Source Control Strategy (JSCS), which indicates that SLVs are only appropriate for screening. Third, LSS believes that the removal action should be based on mass removal and other factors unrelated to sediment contaminant concentrations that will be determined during the EE/CA. EPA’s response to these complaints first includes clarification of EPA’s intended use of SLVs followed by direct responses to LSS arguments.

EPA’s General Concept for the Arkema Sediment Removal

For any removal action, EPA must make two decisions. First, EPA must decide what and where action is to occur given the objectives of the action (i.e., the RAA boundary). Second, EPA must determine when removal is adequate to meet the objectives. Since signing the Administrative Order on Consent for Removal Action in July 2005, EPA and Arkema have debated and extensively discussed how the work plan should articulate the basis for deciding the boundaries for the EE/CA analysis and final RAA, e.g., where action is to occur and why. The Administrative Order on Consent (AOC) provides that at minimum the removal action would address principal threat material. Additionally, the SOW provided the removal action objectives. See pages 16 and 1 of the AOC and SOW, respectively (provided in Attachment A to this Statement). EPA’s May 2007 Work Plan provided a basis for what was PTM in Chapter 6. PTM was defined as material with concentrations of DDX or other chemicals of interest that exceeded one of two benchmarks, 1000x SLVs based on bioaccumulation of chemicals in fish tissue and subsequent consumption of these fish by people and PECs that represent threshold concentrations for direct contact effects for ecological receptors. Those SLVs/PECs lower than the PTM concentrations were benchmarks for achieving the Removal Action Objectives (RAOs), and thus, for judging the adequacy of the removal action.

Arkema disputed the use of the PEC and 1,000 x bioaccumulation fish consumption values for defining PTM. Much discussion and negotiation ensued. EPA thought agreement was reached, as reflected in our November 7, 2007 letter, on a path forward for defining the RAA boundary in which the EE/CA analysis would be conducted (see Attachment A to this Statement). The agreement reached was to eliminate the use of the phrase PTM in relation to the PEC and 1,000 X bioaccumulation values (SLVs), but that those values as well as the risk-based bioaccumulation SLVs would remain in the Work Plan for purposes of evaluating dredging and judging the adequacy of the removal action in the EE/CA. Additionally, it was agreed that the EE/CA analysis could be contained within the boundary originally drawn as the Preliminary RAA boundary in Attachment A to the AOC. The areal extent of the EE/CA analysis was thus established and, after November 7th, was no longer an issue until Arkema raised the issue of disposal and wanted the option to evaluate a CDF. To attempt to resolve that issue, EPA offered another compromise that involved limiting the areal extent of the removal action even more in hopes that the smaller area, and thus decreased amount of dredged sediment, would offset cost or other concerns that Arkema has relative to landfill disposal. (See Attachment A to this Statement, Lori Cora’s email to Claudia Powers dated

January 30, 2008). However, nothing in EPA's January 30 compromise offer changed the purpose or use of the SLVs as judging the adequacy of the removal action.

Removal Action Area - In a previous analysis, Arkema estimated the amount of DDx mass that would be removed using different concentrations of DDx for the lateral and vertical boundaries of the RAA. Using 5 ppm, Arkema estimated that a little over 90% of the DDx mass in sediment offshore of the Arkema property would be removed. As it stands currently, for the Arkema sediments removal, EPA has suggested that the areal extent of the RAA can be defined as the areal (horizontal extent) of sediment contamination defined both at the surface and at the depth of the lateral edges of the RAA where DDx concentrations exceed 5 ppm. This approach defines the edges of the RAA and answers the question of what and where action is to occur. For this decision, 5 ppm DDx is used to provide justification for taking action. For example, 5 ppm is a little over 100,000 times the bioaccumulation SLVs for DDx based on fish consumption by humans and the PEC for DDE or direct contact to sediment by ecological receptors.

Adequacy of Removal Action - As discussed above, Arkema and EPA agreed, as of November 7, 2007, that the SLVs would remain in the Work Plan for purposes of evaluating dredging and evaluating the effectiveness of the removal action in the EE/CA. The AOC and SOW, agreed to by both EPA and Arkema, provide a list of Remedial Action Objectives (RAOs) to be met by any removal action. RAOs are listed below.

1. Reduce human health risks to acceptable levels from direct contact with and incidental ingestion of chemicals of concern (COCs) in sediments and riverbank within the RAA.
2. Reduce COC concentrations in sediments and riverbank within the RAA to levels that will result in acceptable risks to humans that eat fish and shellfish from the Willamette River.
3. Reduce human health risks to acceptable levels from direct contact with and incidental ingestion of water with COCs within the RAA.
4. Reduce ecological risks from contact with and ingestion of COCs in sediments or riverbank material or prey within the RAA to acceptable levels.
5. Reduce ecological risks to acceptable levels from contact with and ingestion of water with COCs within the RAA.
6. Eliminate the potential for migration of contaminants at unacceptable levels from the RAA to the Willamette River.
7. Reduce contaminant flux from uplands, riverbank, and sediments so that recontamination of any sediment or riverbank caps put in place does not occur.

All of these RAOs focus heavily on risk reduction as opposed to mass removal or source control. Risk reduction can be defined in several ways, but is typically a function of

environmental contaminant concentrations rather than contaminant mass. SLVs or multiples of SLVs and PECs are appropriate targets for assessing environmental concentrations, and allow for evaluation of potential hazards based on residual contaminant concentrations, an issue which is not addressed by a removal based solely on contaminant mass. EPA continues to focus on the use of sediment bioaccumulation SLVs and on PECs for evaluating compliance with these RAOs within the RAA, although other criteria may be applied in specific instances. For example, additional criteria could be used to evaluate what constitutes “clean” fill for the RAA after dredging, and compliance with water SLVs/PECs may need to be evaluated to ensure protectiveness of EE/CA actions.

What “Cleanup Standard” means and Use of SLVs in the Arkema Removal Action

Risk-based concentrations, such as SLVs, have been used in several ways and terminology can be confusing. Such criteria can be used as screening values to help define data quality objectives and to evaluate potential hazards. They can also be used as target levels to help determine the need for and extent of clean-up, as points of departure for defining when remediation is complete and as “bright line” standards that are not to be exceeded. For the Arkema EE/CA, EPA intends to use SLVs (particularly 1000x sediment bioaccumulative SLVs and PECs) as points of departure in defining the adequacy of dredging, potential hazards, if any, associated with residual DDx at the bottom of the dredge prism, and what constitutes clean fill. EPA does not intend to use SLVs as “bright line” standards that must be met by the removal. Use of SLVs/PECs as clean-up standards may be what LSS is concerned with in their dispute. In fact, EPA expects that other criteria (e.g. mechanical limitations, contamination in bedrock, evaluation of recontamination potential, sediment stability, etc.), not just SLVs, will play an important role in determining when dredging is complete and what other actions may be necessary to meet RAOs.

For example, EPA would want to continue dredging within the RAA to ensure that the RAOs would be achieved within the RAA. Thus, dredging might include removal of an adequate volume of sediment in the upper portion of the RAA to ensure that human and ecological risks from direct contact with sediment/water and from consumption of biota contaminated through bioaccumulation are reduced to acceptable levels (i.e., compliance with RAOs 1-5). Evaluation of contaminant flux and recontamination potential (e.g., potential for groundwater moving through the removal area to transport contaminants into the bioturbation zone and the potential for disturbance of sediments), would also need to be evaluated in sediments at depth within the RAA to ensure compliance with RAOs and 6 and 7. Limitations to dredging at depth (e.g. stability of sediments at the edge of the RAA, mechanical limitations), and other considerations may indicate that other actions (e.g. capping) be employed to address RAOs after reaching practical limits of dredging. Another way to state EPA’s use of SLVs/PECs is to help ensure, as much as possible, that the removal is the only and final action necessary within the RAA.

Responses to Arkema’s Arguments

Key arguments presented by Arkema and responses to the arguments are provided below.

The language “[SLVs/PECs will be used only] for the purpose of evaluating dredging and judging the effectiveness of the removal action”, was agreed to by both parties during final revision of the EE/CA Work Plan. However, Arkema argues that this language limits use of

SLVs to post-dredging characterization. Such use, in Arkema's view, may help inform the need for capping.

EPA agrees that comparison of residual concentrations with SLVs could afford information to assess the need for and type of capping. However, EPA contends that the above language is entirely consistent with the use of SLVs/PECs as described in the preceding section. Evaluating dredging and assessing the effectiveness of the removal can reasonably include using SLVs to help define, along with other criteria, when removal is complete. Arkema believes that its correspondence indicates that its intent was not to use SLVs to define clean-up in any fashion. Though this could have been Arkema's intent, the agreed to language did not state this, and EPA needs some concentration benchmarks to assess any removal action in relation to RAOs. SLVs/PECs are one of several important components of this evaluation.

Arkema also argues that the "use of SLVs as *de facto* cleanup levels directly contradicts EPA's Joint Source Control Strategy ...". The JSCS is a convenient listing of appropriate literature values. However, the JSCS for the identification and evaluation of upland sources to the Portland Harbor Superfund Site is not relevant in determining how to judge the adequacy of a hotspot removal action in the river at the Arkema site. In addition, removal actions are frequently evaluated and implemented before the development of site-specific cleanup levels. Risk assessment, if performed as part of the EE/CA, is addressed only at a screening level and cleanup criteria often default to conservative values. This approach helps ensure that removal actions do not have to be reconsidered based on results from RI/FS assessments. EPA is using a typical approach to develop and evaluate the Arkema removal action.

Finally, Arkema contends that language such as "EPA will agree that the EE/CA may be limited to the area with a maximum areal/horizontal extent of 5 ppm DDx ..." and "... based on the current analysis of data available to date, the logical breakpoint in the mass to volume relationship falls in the ~90% range of total DDX" indicates that any dredging will be based solely on an attempt to remove approximately 90% of the mass of DDx currently in the sediments offshore of the Arkema site. Arkema may be confusing the separate decisions for removal actions discussed in the first section. EPA agrees to use 5 ppm as a means to define the areal (horizontal) extent of the removal. EPA agrees that this is a reasonable way to focus on a high priority component of the DDx source to the river, and to limit the scope of the removal to something that can be accomplished in one or two work seasons. However, once the RAA has been defined, numerous criteria can reasonably be used to help determine the extent of dredging, the need for additional actions to prevent further releases, recontamination potential, and evaluation of the fill material. Risk-based concentration SLVs/PECs will be one of these criteria. EPA may want to require more dredging, if such removal will address uncertainties identified in evaluating recontamination potential and/or sediment stability.

Summary of SLV Position

The uses for SLVs/PECs discussed above and summarized below are consistent with removal actions in general, with the AOC and SOW and with the agreed upon language of November 7. EPA's last compromise offer agreed that using a DDx concentration in sediments of 5 ppm (using current data) is reasonable in defining the areal (horizontal extent) of RAA and removal action boundaries. EPA's last compromise offer does not use SLVs or any other risk-

based concentration to define this boundary. EPA proposes that risk-based SLVs will be used in the following ways:

1. Decisions regarding extent of dredging within the RAA need to address RAOs defined for the action. These RAOs are primarily risk-based. Since risks are typically more a function of concentration than of mass, use of SLV's is one appropriate means to address residual concentrations.
2. Removal actions typically occur prior to development of a site-specific baseline risk assessment and generic risk-based targets are commonly used as at least a partial basis for defining scope and extent for removals. EPA proposes using the SLVs and PECs for defining scope and extent within the RAA. These criteria will be used in concert with exposure potential (e.g. sediment stability and potential for recontamination) to evaluate clean-up within the RAA.
3. EPA agrees that several criteria, including SLVs and multiples of SLVs might be used to help define an appropriate extent for sediment removal within the RAA. However, concentration values are appropriate benchmarks for evaluating if the RAOs have been achieved.
4. SLVs/PECs will not be used as "bright-line" clean-up standards. Instead, EPA's intended use of risk-based criteria is as points of departure in evaluating an appropriate vertical extent for dredging within the RAA, assessing the need for additional actions (e.g. capping) and assessing fill materials.

EPA believes that risk-based criteria are necessary to appropriately evaluate RAOs for the removal action. EPA recognizes that use of these criteria will be subject to modification/interpretation based on a number of other factors, including limitations to dredging technology, potential for recontamination, sediment stability, etc. The degree to which SLVs/PECs might influence the extent of excavation will need to be determined based on analyses to be presented in the final EE/CA.

A AND B COMMENT SET

EPA has the following comments on the A and B Comments presented in Tab 1 of the LSS February 19, 2008 dispute statement.

General comment: The preface text accompanying both comment sets should be changed as noted in Attachment B to this Statement.

Specific comment: For "A" Comment No. 32, EPA does not agree to delete Lindane as a COI. Table 5-3a in the May 2007 EE/CA Work Plan shows that 47% of the detected concentrations of Lindane (gamma-HCH) in sediment exceeded the PEC (33% of the ND exceeded the SLV) and about 7% of the detected concentrations exceeded 10X the PEC.

Attachment A
Background Documents

(Live link provided to each document below title)

LSS Position Statement and Associated Documents (PDF), February 19, 2008

[http://yosemite.epa.gov/r10/CLEANUP.NSF/PH/Arkema+Technical+Documents/\\$FILE/LSS+Position+Statement.pdf](http://yosemite.epa.gov/r10/CLEANUP.NSF/PH/Arkema+Technical+Documents/$FILE/LSS+Position+Statement.pdf)

Arkema June 26 Presentation, June 26, 2007

<http://yosemite.epa.gov/r10/CLEANUP.NSF/ph/June+26+Arkema+Presentation>

Arkema EECA Workplan 2007 (PDF), May 11, 2007

[http://yosemite.epa.gov/r10/CLEANUP.NSF/PH/Arkema+EECA+Workplan+2007/\\$FILE/Arkema+EECA+Work+Plan-Front.pdf](http://yosemite.epa.gov/r10/CLEANUP.NSF/PH/Arkema+EECA+Workplan+2007/$FILE/Arkema+EECA+Work+Plan-Front.pdf)

Administrative Order on Consent CERCLA-10-2005-0191, June 27, 2005

[http://yosemite.epa.gov/R10/CLEANUP.NSF/6d62f9a16e249d7888256db4005fa293/25e3e8edb66bd9a688257142006a3860/\\$FILE/finalaocremoval.pdf](http://yosemite.epa.gov/R10/CLEANUP.NSF/6d62f9a16e249d7888256db4005fa293/25e3e8edb66bd9a688257142006a3860/$FILE/finalaocremoval.pdf)

Statement of Work, June 27, 2005

[http://yosemite.epa.gov/R10/CLEANUP.NSF/6d62f9a16e249d7888256db4005fa293/25e3e8edb66bd9a688257142006a3860/\\$FILE/finalSOW%201%202005.pdf](http://yosemite.epa.gov/R10/CLEANUP.NSF/6d62f9a16e249d7888256db4005fa293/25e3e8edb66bd9a688257142006a3860/$FILE/finalSOW%201%202005.pdf)

EPA T4 Comment Summary, See page 1

(Document included at end of this attachment)

EPA T4 Comments and Responses, See page 38 comment ID #74 (Portland Harbor CAG), comment number 8. See also comments 1, 2, 3, 4, 5, and 7.

(Document included at end of this attachment)

Claudia Powers

From: Cora.Lori@epamail.epa.gov
Sent: Wednesday, January 30, 2008 1:47 PM
To: Claudia Powers; Yamamoto.Deb@epamail.epa.gov; Doug LOUTZENHISER; Sheldrake.Sean@epamail.epa.gov; Todd SLATER
Subject: EPA proposal

Claudia and others:

As we discussed yesterday, EPA makes the following offer in order to avoid formal dispute on the last outstanding Arkema issue, which is whether DDT contaminated sediment addressed by this removal action can be assessed for disposal in an in-water confined disposal facility. If Arkema disputes any issue related to the third EPA-drafted workplan, or later in the EE/CA process insists on CDF evaluation in the EE/CA for contaminated materials addressed by this removal action, this offer will be rescinded.

"EPA will agree that the EE/CA assessment for removal of contaminated sediment may be limited to the area with a maximum areal/horizontal extent of 5 ppm DDX, as measured at surface and detected at depth. Once further characterization of the area comprising 5 ppm DDX or higher is bounded, the EE/CA evaluation may further refine the removal action area (RAA) due to other constraints discussed in the workplan to yield the final RAA. As previously agreed during the informal dispute process, within the final RAA selected in the Action Memo, dredging would then take place to risk-based SLVs as defined in EPA's 3rd ee/ca workplan, as amended or modified by the EE/CA analysis."

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January 15, 2008

Delivered by Electronic Mail

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Re: January 18, 2008, 8:00 a.m. Teleconference to Resolve Disputed Issues
U.S. EPA Region 10 Docket No. CERCLA 10-2005-0191

Dear Lori:

This letter responds to your request for written confirmation of the issue(s) in dispute between the U.S. Environmental Protection Agency (EPA) and Legacy Site Services LLC (LSS) concerning the above-captioned matter and to Sean Sheldrake's letter of November 29th, 2007. As you know, the LSS and EPA project teams have worked diligently through 2007 to sort and resolve hundreds of comments on the draft EE/CA Work Plan. By the fall of 2007, the teams were narrowing the list to the last major issues and beginning to reach agreement on them. On December 17, 2007, you and I discussed the last issue that, if resolved, would allow LSS to accept significant compromises on remaining issues and agree to disagree on others in order to move the EE/CA Work Plan into final production.¹ The last technical issue is whether EPA will allow LSS the opportunity to evaluate the feasibility of a near shore confined disposal facility (CDF) in the EE/CA in accordance with the AOC and EPA guidance. If EPA will allow LSS this opportunity, the remaining issues arising from the myriad comments will be resolved as well. If not, LSS will have to revisit the disputed issues lists in their entirety.

In a December 10, 2007 e-mail, Mr. Slater wrote to Mr. Sheldrake that Comment 38 pertaining to the CDF and confined aquatic disposal (CAD) technology screening in the A list of comments was still at issue. Mr. Slater explained that, in his opinion, an on-site upland disposal facility is very similar to a near shore CDF. He went on to offer the following compromise:

¹ LSS agrees with EPA that resolution of the contested oversight costs is distinct from the EE/CA Work Plan dispute and will be addressed on a separate track. See Sheldrake letter dated November 29, 2007.

Lori Houck Cora
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So, if you can agree that the EECA can evaluate a near shore CDF, then I can also agree that a Confined Aquatic Disposal (CAD) would remain excluded from the EECA. I think if we agree on this . . . this will be the last point and we can memorialize the end of the dispute on the EECA Work Plan and get on with the work.

Mr. Sheldrake responded that same day, in pertinent part, "EPA in no way considers a nearshore [sic] CDF to be similar to an upland disposal facility." In his e-mail, Mr Sheldrake elaborated the reasons why, in his opinion, a CDF is different from an upland disposal facility, concluding that EPA would not deem a CDF option protective, and therefore, "[T]he appropriate action to take in this case is to screen the alternative out." However, as has been demonstrated at a number of USEPA and SMWG conferences, CDF's can and have been designed to handle Superfund, RCRA, and TSCA materials and are fully protective.

In the original EPA comments on the draft EE/CA Work Plan, EPA did not have the concerns that Mr. Sheldrake now expresses. In EPA's original set of comments on the September 2005 draft EE/CA Work Plan, Comment 53 addressed the CDF issue specifically. At that time, EPA's specific requirement or concern was that a CDF at the Port of Portland's T-4 could only be used with the pre-treatment of sediments. LSS agreed to evaluate pre-treatment if required. In EPA's response to LSS's July 2006 draft EE/CA Work Plan, Comment 53 was not listed as one of the "non-responsive" comments. Therefore, LSS concluded that there was no dispute regarding the CDF issue. The issue arose by EPA's omission in its May 2007 draft EE/CA Work Plan. LSS submitted Comment 38 in response to EPA's Work Plan noting, among other things, that the near shore CDF and the CAD disposal options had been deleted, an unexpected reversal of EPA's previous decisions concerning options that should be considered as part of the in-water EE/CA. EPA and LSS remain in disagreement concerning the inclusion of an evaluation of a near shore CDF in the technology screening and analysis section of the EE/CA Work Plan.

One of the most significant problems with EPA not agreeing to LSS's evaluation of various technologies for the Arkema site, particularly in view of other recent EPA decisions to limit the EE/CA technologies to be evaluated,² is that it reduces what otherwise would be an EE/CA to a presumptive remedy. To the contrary, EPA's *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites* (EPA 2005), specifically emphasizes that the feasibility analysis should be site-specific.

...due to the limited number of approaches available for contaminated sediment, generally, project managers should evaluate each of the three major approaches monitored natural recovery (MNR), in-situ capping, and removal through dredging or excavation at every sediment site. Depending on site-specific

² EPA has determined in its responses to comments that "capping may be considered to address *limited conditions* (emphasis added) . . ." and "mechanical dredging without hydraulic containment does not meet EPA's protectiveness criteria. . . ."

Lori Houck Cora
January 13, 2008
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conditions, contaminant characteristics, and/or health or environmental risks at issue, certain methods or combinations of methods may prove more promising than others. Each site and the various sediment areas within it present a unique combination of circumstances that should be considered carefully in selecting a comprehensive site-wide cleanup strategy. At large or complex sediment sites, the remedy decision frequently involves choices between areas of the site and how they are best suited to particular cleanup methods rather than a simple one-size-fits-all choice between approaches for the entire site.

(Page 7-3, EPA 2005)

Also, EPA's seventh risk management principle (from EPA's 11 risk management principles for sediment sites, EPA 2002) directs EPA to: "Select site-specific, project-specific, and sediment-specific risk management approaches that will achieve risk-based goals." In addition, the Statement of Work (SOW) in the Administrative Order on Consent (AOC) between Arkema and EPA states that the EE/CA Work Plan is to include a description of the analysis to be conducted to determine disposal facility or containment options for contaminated sediment. The SOW further states that investigation activities will result in data to evaluate technologies for sediment remediation including capping, dredging, treatment, including any necessary treatability testing, and disposal (on-site and off-site). The SOW also requires that the EE/CA Report contain identification and analysis of removal action technologies, identification and analysis of removal action alternatives (including the identification and analysis of disposal facility or containment options), and comparative analysis of removal action alternatives.

By screening out even the near shore CDF before a fully fledged option has been evaluated and presented, EPA is attempting to modify the AOC and jump over the site-specific considerations and specific risk management approaches that are imbedded in both law and guidance.

You mentioned during our December 31, 2007 conference call, EPA is not willing to commit the government team's review time to a CDF option since the harbor-wide RI/FS will be taking up the majority of the government's review time for the next several years. LSS recognizes and appreciates EPA's opinions regarding its resource priorities and the potential difficulties and expense that LSS may incur in developing an analysis of a near shore CDF. LSS understands and appreciates the implications of the delay in the development of the Port's T-4 CDF. However, given the history of the Port project and our project, it is clear that uncertainties regarding disposal options are important and may change in the future. Therefore, without allowing LSS to consider evaluating a disposal options even before the draft EE/CA Work Plan is completed does not seem advisable and is not consistent with the AOC, agency guidance or policy.

For the reasons set forth above, and those that may be presented during the teleconference, LSS respectfully asks that it be allowed to evaluate a near shore CDF disposal

ATERWYNNE^{LLP}

Lori Houck Cora
January 13, 2008
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options in the draft EE/CA Work Plan. If this remaining issue is resolved, LSS can then proceed to draft the Work Plan Addendum. Thank you for consideration of our request.

Very truly yours,

Claudia K. Powers

cc: Doug Loutzenhiser, LSS *via email only*
Todd Slater, LSS
Audie Huber, Umatilla Tribe
Brian Cunninghame, WarmSprings Tribe
Erin Madden, Nez Perce Tribe
Sheila Fleming, Ridolfi
Jeff Baker, GrandeRonde Tribe
Tom Downey, Siletz Tribe
Rob Neely, NOAA
Jeremy Buck, USFW
Greg Smith, USFW
Jim Anderson, DEQ
Matt McClincy, DEQ
Mike Poulsen, DEQ
Jennifer Peterson, DEQ
Rick Kepler, ODFW
Cyril Young, DSL
Deb Yamamoto, EP A
Lori Cora, EP A
Chip Humphrey, EPA
Eric Blischke, EP A
Kristine Koch, EP A
Rene Fuentes, EP A
Dana Davoli, EP A
Deb Yamamoto, EP A
Nancy Munn, NOAA-NMFS
Preston Sleeper, USDOJ



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

November 29, 2007

Reply to
Attn of: ECL-110

Mr. Todd Slater
Legacy Site Services, LLC
468 Thomas Jones Way
Exton, PA 19341

Subject: Proposed Teleconference or Meeting to Resolve any remaining Disputed Issues; Status of Category A, Category B Comments

Dear Mr. Slater:

I am writing to send EPA's latest revisions to the July 13, 2007 Category A and B comment spreadsheets being used to document resolutions reached. The attached spreadsheets reflect the current status and/or specific resolutions as understood by EPA since the November 13, 2007 meeting and our review of Arkema's last proposed language. We believe significant progress has been made to come to resolution on the Category A issues. As was understood by EPA from the beginning, if agreement could be reached on the Category A issues, Arkema's dispute on the EE/CA Work Plan would be resolved and Arkema and EPA could move forward to begin implementing the EE/CA Work Plan. Toward that goal, EPA has offered significant compromises to try to reach agreement.

We are in receipt of your November 16, 2007 letter; however, we are not clear what your letter proposed, and it seems we may have gone backward. It is clear there still are a few remaining disputed issues. Drafting the addendum to the Work Plan would be premature until there is agreement on every issue.

We propose that a meeting or telephone conference including managers, Deb Yamamoto and Doug Loutzenhiser, and legal counsel be held soon as the last attempt to reach resolution through the informal dispute process. We would like the meeting or conference call to occur the second or third of week of December. Please coordinate with Doug and Claudia Powers and let us know your availability for such a discussion and whether you can come to Seattle or will participate by conference call. Prior to that meeting, Arkema needs to articulate clearly and specifically which Category A comments are still in dispute and what about EPA's language as reflected in the attached spreadsheets is unacceptable. Additionally, we understand Arkema is disputing a significant share of EPA's latest oversight bill. Although further discussions need to occur about the oversight bill and Arkema's dispute, EPA believes we can resolve the Work Plan dispute, and that the oversight bill dispute is separate and distinct. If Arkema does not hold that same view,

please inform us immediately.

Thank you for the time and effort you have put into this matter. The Work Plan dispute has been going on far too long, but we are encouraged that there may be agreement soon. Time is running out for continual informal dispute discussions and, if at the next meeting agreement is not reached, we must move the dispute to the Director's level so that the work plan can be finalized and cleanup work can begin. Please contact me at (206) 553-1220 or via e-mail at sheldrake.sean@epa.gov with any questions or concerns.

Sincerely,

Sean Sheldrake, RPM

Enclosures

Cc:

Audie Huber, Umatilla Tribe
Brian Cunninghame, Warm Springs Tribe
Erin Madden, Nez Perce Tribe
Sheila Fleming, Ridolfi
Jeff Baker, GrandeRonde Tribe
Tom Downey, Siletz Tribe
Rob Neely, NOAA
Jeremy Buck, USFW
Greg Smith, USFW
Jim Anderson, DEQ
Matt McClincy, DEQ
Mike Poulsen, DEQ
Jennifer Peterson, DEQ
Rick Kepler, ODFW
Cyril Young, DSL
Deb Yamamoto, EPA
Lori Cora, EPA
Chip Humphrey, EPA
Eric Blischke, EPA
Kristine Koch, EPA
Rene Fuentes, EPA
Dana Davoli, EPA
Deb Yamamoto, EPA
Nancy Munn, NOAA-NMFS
Preston Sleeper, USDOJ

via email only



November 16, 2007

Mr. Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue
Suite 900, M/S ECL-110
Seattle, Washington 98101

Subject: Response to November 7, 2007 Letter; Proposed PTM Language Revision
Administrative Order on Consent (AOC) for Removal Action
U.S. EPA Region 10 Docket No. CERCLA 10-2005-0191

Dear Mr. Sheldrake:

This letter responds to your November 7, 2007 letter, which included EPA's responses to the Category A and Category B comments, the proposed principal threat material (PTM) language, and EPA's rationale for not removing its "non-responsiveness" determination on 46 EPA comments on the July 14, 2006 LSS Draft EE/CA Work Plan (LSS Draft Work Plan). We first note that much progress has been made in finalizing the draft EE/CA Work Plan for the above-captioned matter. As stated in your letter, we have reached agreement on the PTM language that will be added into the Addendum for the Final Work Plan. We have also reached agreement on most Category A and B comments, with only a few remaining to be resolved. However, we have yet to resolve two critical issues: (1) how to deal with a number of government team comments which are not addressed in EPA's May 11, 2007 Draft EE/CA Work Plan (EPA Draft Work Plan); and (2) EPA's position to use only an Addendum and not to modify the portions of the text within the EPA Draft Work Plan to reflect the agreed changes.

As we have discussed, the EPA Draft Work Plan was non-responsive to 46 government team comments that were listed in EPA's disapproval of the LSS Draft Work Plan by letter dated September 21, 2006. Furthermore, non-responsiveness is what EPA asserts as a primary reason for taking over revisions to the LSS Draft Work Plan. LSS has asked that EPA retract the "non-responsiveness" determinations for these comments. In your November 7th letter, EPA proffers three explanations of why these non-responsive issues are no longer deemed relevant. Provided below are those three explanations followed by the LSS responses.

EPA Statement 1

"It was only after EPA took over the work plan revisions did LSS announce that it was not pursuing the innovative treatment technologies and would begin to design a hydraulic control barrier wall, making further information on such studies irrelevant."

November 13, 2007

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LSS Response

LSS submitted the LSS Draft Work Plan to EPA on schedule in July 2006. LSS notified DEQ during the week of August 21, 2006 that there was a change in the groundwater source control approach and that LSS would be evaluating a barrier wall with groundwater extraction and treatment at the site. EPA, at a minimum, was notified in writing of this change as documented in an August 31, 2006 email from Matt McClincy addressed to Todd Slater and copied to Sean Sheldrake (attached). In a letter dated September 21, 2006, EPA notified LSS that it would take over revisions to the LSS Draft Work Plan. In that same letter, EPA provided its comments on the LSS Draft Work Plan, including the “non-responsive” determinations related to an upland groundwater source control strategy that it had been advised was no longer relevant. EPA had knowledge of the change concerning groundwater source control at the Portland site about a month prior to its submittal of comments on the LSS Draft Work Plan. Therefore, it is inaccurate for EPA to state that it was only after EPA took over the work plan revisions that LSS announced it was not pursuing its original source control strategy, nor is it accurate to use the “non-responsive” determinations concerning the outdated source control strategy as part of a rationale for a finding of insufficiency of the LSS Draft Work Plan.

EPA Statement 2

“Additionally, other comments in Category B were comments seeking information in Arkema's possession and not easily obtained by EPA.”

LSS Response

There were three comments in the Category B list (comments 67, 85, 92) pertaining to 1) dredge project data, 2) fill history, and 3) the Lot 1 DDT trench that EPA claims Arkema (LSS) had information in its possession that EPA did not have. However, as clarified in our responses to Category B comments provided and discussed with you on November 13, 2007, all of the information that LSS has in its possession related to these issues was provided in the LSS Draft Work Plan. No information was withheld from EPA.

EPA Statement 3

“Other issues not addressed in EPA's work plan may reflect other changes in circumstances since Arkema's draft work plan was reviewed by EPA, or reflects a decision to conserve agency resources in producing its work plan.”

LSS Response

The “other issues” that caused a “change in circumstances since Arkema's draft work plan was reviewed...” are not provided in your November 7, 2007 letter, and therefore, LSS cannot respond directly to these “other issues.” LSS is unaware of “changed circumstances” that would warrant sustaining the “non-responsive” determinations. In addition, EPA also proposes in part to deal with their non-responsive issues reflected in these comments by addressing them, if at all, in documents other than the work plan or in ongoing upland source control efforts. Given EPA's

November 13, 2007

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proposed handling of their non-responsive comments, LSS reiterates its position that these issues and comments should not have been addressed in the work plan in the first instance and were not a valid basis for EPA's disapproval of the LSS Draft Work Plan. Therefore, EPA should retract the non-responsive determinations.

Further, we continue to disagree with EPA's insistence on using an Addendum only instead of incorporating agreed changes into the Final Work Plan. Revising the EPA Draft Work Plan to reflect our agreements creates one document with the clear path forward and prevents confusion by the public and all other involved parties. We point to the direction given by Mr. Daniel Opalski in his letter opinion dated November 29, 2006, which was to "*develop and incorporate final Work Plan Language.*" EPA's position and insistence to "not modify any of the Work Plan Language" is contrary to that direction. However, in the interests of moving this project along, we propose that LSS prepare the Addendum after all agreements have been reached. Because the Addendum is a critical part of the Final EE/CA Work Plan, and because the proposed changes to the plan need to be set out in clear, straightforward terms at the beginning of the document so that the reader can follow the logic and the text of the final plan, LSS will prepare an Addendum that can be attached to the front of the Final EE/CA Work Plan. We request assurances by EPA that the final complete document will be posted on the EPA website or otherwise placed in the administrative record in this format.

LSS is eager to move forward on this project. We ask that you help us clarify and resolve the last remaining issues concerning the Final EE/CA Work Plan. We are prepared to begin writing the Addendum immediately upon your written clarification that the government team's comments have been fully addressed, and that the "non-responsive" determinations on the 46 government team comments that are not addressed in the EPA Draft Work Plan are withdrawn or are not requirements of the Final EE/CA Work Plan.

Thank you for your consideration of our proposals.

Sincerely,

Legacy Site Services LLC



J. Todd Slater
Manager, Environmental Technologies
And Remedial Procurement



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

November 7, 2007

Reply to
Attn of: ECL-110

Mr. Todd Slater
Legacy Site Services, LLC
468 Thomas Jones Way
Exton, PA 19341

Subject: Status of Category A, Category B Comments; Proposed PTM Language
Revision

Dear Mr. Slater:

This letter conveys to Legacy Site Services (LSS) the current status of comments pertaining to the revised EE/CA Workplan conveyed to LSS on May 11, 2007, for your evaluation and discussion on our planned November 13 teleconference. Please see the enclosed LSS Category A and Category B comments with proposed solutions for incorporation in the work plan addendum and other future documents, as recently discussed.

With respect to Category B LSS comment number one, LSS has requested that EPA remove its "non-responsive" determination on approximately 46 EPA comments on Arkema's draft work plan because LSS claims EPA did not address those comments in its draft Work Plan. LSS designated the comments in question as Category B comments. EPA and LSS discussed a majority of the Category B comments in a telephone conference on October 26, 2007. The attached list is a summary of the current status of each comment. As discussed, the Category B comments related to numerous issues and the status of such issues has changed over time. For example, a majority of Category B comments related to additional information or details needed about the upland pilot studies and treatment technologies LSS was pursuing. Arkema did not respond to those comments in its revised work plan, which led to the non-responsive determination. It was only after EPA took over the work plan revisions did LSS announce that it was not pursuing the innovative treatment technologies and would begin to design a hydraulic control barrier wall, making further information on such studies irrelevant. Additionally, other comments in Category B were comments seeking information in Arkema's possession and not easily obtained by EPA. Other issues not addressed in EPA's work plan may reflect other changes in circumstances since Arkema's draft work plan was reviewed by EPA, or reflects a decision to conserve agency resources in producing its work plan.

Lastly, EPA agrees with the October 23, 2007 proposed revisions to the language supporting dredging at the Arkema Site, enclosed. Please contact me at (206) 553-1220 or via e-mail at sheldrake.sean@epa.gov with any questions or concerns.

Sincerely,

Sean Sheldrake, RPM

Enclosures

Cc:

Audie Huber, Umatilla Tribe
Brian Cunninghame, Warm Springs Tribe
Erin Madden, Nez Perce Tribe
Sheila Fleming, Ridolfi
Jeff Baker, GrandeRonde Tribe
Tom Downey, Siletz Tribe
Rob Neely, NOAA
Jeremy Buck, USFW
Greg Smith, USFW
Jim Anderson, DEQ
Matt McClincy, DEQ
Mike Poulsen, DEQ
Jennifer Peterson, DEQ
Rick Kepler, ODFW
Cyril Young, DSL
Deb Yamamoto, EPA
Lori Cora, EPA
Chip Humphrey, EPA
Eric Blischke, EPA
Kristine Koch, EPA
Rene Fuentes, EPA
Dana Davoli, EPA
Deb Yamamoto, EPA
Nancy Munn, NOAA-NMFS
Preston Sleeper, USDOJ

via email only

The following paragraph for inclusion in the Arkema Early Action EE/CA Work Plan is Legacy Site Services's (LSS's) redline version of EPA's suggested language sent to Mr. Todd Slater on October 17, 2007. LSS proposes changing the last sentence of the paragraph because (1) the language proposed by EPA is premature in that the feasibility analysis conducted as part of the EE/CA evaluation determines the scope of the dredging and capping work necessary to achieve the remedial action objectives in the Scope of Work, (2) there are more than two SLVs within the Work Plan as it is currently written, and (3) additional SLVs may factor into the evaluation of the work depending on progress and results of the RI conducted by the LWG.

EPA and Arkema agree that the term "Principal Threat Material" or "PTM" should be removed from the May 2007 Work Plan as unnecessary for articulating the basis for taking a removal action at the Arkema site. EPA and Arkema were not able to come to agreement as to what concentrations and chemicals at the site constitute Principal Threat Material, but EPA and Arkema have agreed on the RAA boundary in which the EE/CA analysis will be conducted, and agree that a non-time critical removal action in that RAA boundary will address a significant amount of high concentration sediment and will significantly reduce risk to human health and the environment. Principal Threat Material and/or PTM is no longer deemed relevant to the discussion of the screening level values in Chapters 6 and 7 of the May 2007 Work Plan. EPA and Arkema agree to remove the term "principal threat material" in relation to the screening level values, e.g., 1 x PEC and 1,000 x bioaccumulation SLV. The screening level values will remain in the Work Plan, including both the 1 x PEC and 1000 x bioaccumulation SLV, for the purpose of evaluating dredging and judging the effectiveness of the removal action in the EE/CA.

Deleted: as risk screening levels for defining the basis for a dredging evaluation



September 28, 2007

Mr. Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue, ECL-111
Seattle, Washington 98101

Re: Arkema Portland Site
U.S. EPA Region 10 Docket No. CERCLA 10-2005-0191

Dear Mr. Sheldrake:

This letter is in response to the United States Environmental Protection Agency ("EPA") letter dated August 28, 2007, which responds to the Legacy Site Services LLC ("LSS") July 13, 2007 submittal. On July 13, 2007, LSS provided to EPA both a letter and list of the key issues that require further technical resolution and discussion prior to finalization of the EE/CA Work Plan being developed pursuant to the above-captioned proceeding. With our common goal of ending the dispute on the draft EE/CA Work Plan in mind, we provide a suggested path forward based on our understanding of the proposal included in your August 28 letter. If our proposed path forward meets with your approval, we believe that all outstanding issues (category "A" comments) can be resolved and the formal dispute ended. Following our proposal you will find attached our technical memorandum responding to each section of your August 28, 2007 letter that we believe required further clarification.

LSS' PROPOSED PATH FORWARD

In your letter, LSS agrees with EPA's proposal to remove the term "principal threat material" in relation to the SLVs, 1 x PEC and 1,000 x. bioaccumulation SLV, but instead retain the 1 x PEC and bioaccumulation SLV as risk screening levels for defining the basis for a dredging evaluation (i.e., evaluating the effectiveness and protectiveness for any dredging remedies) in the EE/CA. In addition, LSS appreciates EPA agreeing that the preliminary RAA boundary as drawn on the map attached as Appendix A to the Administrative Order on Consent can constitute the outer boundary within which further EE/CA analysis and dredging evaluations will be conducted, including additional site characterization for data gaps. LSS agrees with EPA that pre-and post-project biota and/or sediment data outside the RAA will be needed for recontamination/off-site migration analyses. LSS also agrees with EPA that any material that remains outside of the RAA would still be subject to future characterization, risk assessment, and cleanup in accordance with the Portland Harbor RI/FS and Record of Decision.

LSS understands that EPA also accepts that the mass-to-volume relationship is a valuable tool for considering the implementability of technologies for a removal action. At our June 26, 2007 meeting, we understood that EPA agreed to include the mass removal analysis approach as an addendum with necessary modifications to Sections 6 and 7 of the May 11, 2007 Work Plan. We also understood that it would be utilized as a tool in the EE/CA process to further define both PTM and the RAA. Even though EPA does not agree that it will be the primary criteria for identifying PTM, LSS respectfully requests that LSS be permitted to draft an addendum to the May 11, 2007 Work Plan, which will essentially define Arkema's PTM for this EE/CA as being the DDx hotspot. In addition, the logical breakpoint of the DDx mass-to-volume relationship will be utilized as a valuable tool in determining the practicable effectiveness of remedial action options for addressing PTM inside the RAA boundary.

Recall that the mass removal approach uses different DDx mass-to-volume relationships to define the breakpoint in the data that correlates with the practicable effectiveness of the removal action that will be evaluated in the EE/CA in accordance with the criteria in the NCP. Based on LSS' initial analysis of approximately 230 sediment sample data points at the Arkema site, the breakpoint in the DDx mass that can be practicably addressed in the EE/CA is approximately 90 percent of the DDx mass. LSS believes that preparation of an addendum can be done with some minimal modifications to Sections 6 and 7 of the May 11, 2007 Work Plan and that all of the extensive screening and analysis performed in Section 6 can be retained. Based on the analysis thus far, the logical breakpoint in the mass-to-volume occurs at approximately ± 90 percent DDx mass. This percentage may fluctuate somewhat up or down based upon the evaluation of the data collected as part of the data gaps analysis/EE/CA site investigation. Accordingly, the RAA boundary would be further refined in the EE/CA site investigation through the collection and analysis of these additional sediment data in those areas that would help refine/better define the breakpoint in the mass-to-volume relationship. EPA and LSS agree that any material that remains outside of the RAA would still be subject to future characterization, risk assessment, and cleanup in accordance with the Portland Harbor RI/FS and Record of Decision. The benefits from the removal action on the breakpoint in mass-to-volume (approximately ± 90 percent total DDx mass) at the Arkema site would be measurable, and subsequent monitoring data would be used to further evaluate any residual risk concerns at the site.

LSS proposes to draft an addendum to the May 11, 2007 EE/CA Work Plan, prepare necessary modifications to Sections 6 and 7, and prepare the Field Sampling Plan, the QAPP, and all related deliverables for submission to EPA. LSS commits to delivering these documents to EPA within 90 days from receipt of EPA's written agreement to the approach set forth herein and to the resolution and agreement of the remaining issues as set forth in the attachment to the LSS July 13, 2007 letter.

If EPA can agree to the above LSS proposed path forward, the parties can meet to resolve the remaining issues set forth in the attachment to the LSS July 13, 2007 letter, so that this project can move forward expeditiously. LSS is hopeful that EPA will find this a constructive resolution.

September 28, 2007

Page 3

Finally, please be advised that LSS is in receipt of EPA's oversight invoice for the period July 1, 2006 – June 30, 2007. As you know, LSS has requested all backup documentation for the charges by Parametrix. LSS reserves all its rights to contest these charges and would welcome the opportunity to discuss this issue with EPA.

Please contact me at (610) 594-4430 if you have any questions or comments.

Sincerely,

Legacy Site Services LLC



J. Todd Slater

Manager, Environmental Technologies
And Remedial Procurement

Enclosure

cc: (electronic) James M. Anderson, Oregon DEQ
Rick Kepler, Oregon Department of Fish and Wildlife
Rob Neely, NOAA Coastal Resources Coordination
Dr. Nancy Munn, NOAA Fisheries
Jeremy Buck, US Fish and Wildlife
Preston Sleeper, US Department of Interior
Brian Cunninghame, Confederated Tribes of the Warm Springs Reservation of Oregon
Rose Longoria, Confederated Tribes and Bands of the Yakama Nation
Pete Wakeland, Confederated Tribes of the Grand Ronde Community of Oregon
Tom Downey, Confederated Tribe of the Siletz Indians
Audie Huber, Confederated Tribes of the Umatilla Indian Reservation
Erin Madden, Nez Perce Tribe
Jean Lee, Environment International Ltd.
Jennifer Peterson, DEQ
Matt McClincy, DEQ
Mike Poulsen, DEQ
Alex Cyril, DEQ
Cy Young, DSL
John Howland, Parametrix
Peter Battuello, Parametrix
Lori Cora, EPA
Chip Humphrey, EPA



TECHNICAL MEMORANDUM

TO: Sean Sheldrake, U.S. Environmental Protection Agency (EPA)
FROM: Todd Slater, Legacy Site Services LLC (LSS)
DATE: September 28, 2007
SUBJECT: Clarifications and Proposed Resolution of Disputed Directed Changes

LSS believes it is necessary for the record to provide its response to specific aspects of EPA's August 28, 2007 letter. LSS' comments and clarifications, including LSS' understanding of EPA and LSS' respective positions on these points follow the organizational structure of EPA's letter dated August 28, 2007.

Chemical Driver for Removal Action

LSS appreciates EPA's concurrence that DDX is the primary driver for delineating the Removal Action Area ("RAA"). However, it is not clear to LSS what "cleanup levels...shall be developed for the final QAPP COI list in order to assess residual risk for final remedial action evaluation...." means. LSS does not believe it is appropriate to develop cleanup levels in a QAPP. In accordance with the SOW in the May 11 Work Plan, LSS suggests that QAPP DQOs be developed based on the screening values that are accepted by LSS and EPA for the Work Plan and that proposed removal goals be developed later in the EE/CA process. LSS proposes that these goals be included in the EE/CA report.

Technical Comments Requiring Resolution

LSS notes EPA's assurance that the May 11, 2007 Work Plan is a sufficient Work Plan to continue the EE/CA process for the Arkema early action. However, LSS continues to maintain that if (a) EPA considers the comments presented in EPA's disapproval letter dated September 21, 2006 to still be relevant and (b) that EPA considers its May 11, 2007 EE/CA Work Plan to "substantially" address EPA's comments (but does not address all technical issues), then LSS must have a written rationale from EPA which provides the explanation for not addressing specific technical issues that remain in the record, or alternatively, how those issues were addressed in the May 11, 2007 Work Plan.

CSM/COI Attributed to Arkema

LSS appreciates EPA's agreement to replace the recreational user exposure scenario with the trespasser scenario. LSS agrees that institutional controls will consider recreational users and will be improved, if necessary.

LSS is evaluating the differences between the EPA CSM and the current CSM prepared by the Lower Willamette Group in the Portland Harbor RI/FS Comprehensive Round 2 Site Characterization Summary and Data Gaps Analysis Report (Round 2 Report) as it specifically relates to the Arkema site in the Portland Harbor. LSS will prepare a revised site-specific CSM for the Arkema site for submittal to EPA. LSS will accept the submittal of LSS' more site-specific CSM along with EPA's Portland Harbor CSM as a compromise.

LSS included all biota data available at the time its July 14, 2006 draft EE/CA Work Plan was submitted to EPA. In its August 28 letter, EPA states that biota TCDD data from the Arkema RI/FS will be added to the EE/CA Work Plan. LSS is unaware of any such biota TCDD data. If there are additional biota TCDD data that are not already presented, LSS would like to review the biota TCDD data before conclusions are drawn about TCDD/F.

Source Evaluation/Recontamination Potential

LSS appreciates EPA's concurrence that certain COIs have identified sources within Portland Harbor other than the Arkema property. LSS does not accept a conclusion that it is a source of PCBs, lindane, and dioxin based on EPA's statement that "contaminant concentration patterns in surface sediments and in sediments at depth along the length of the Arkema site suggest that Arkema site sediment currently is a potential source for PCBs, lindane, and dioxin/furan to Portland Harbor." LSS understands that these harbor-wide contaminants are present in sediment in front of Arkema property and many other Portland Harbor properties, but the extensive data set for the upland source control work together with the sediment trend analysis in the LWG Round 2 Report indicates the Arkema property is not a source for these COIs. Therefore, LSS suggests the following language:

Many harbor-wide contaminants are present in sediment in front of Arkema property, however, the extensive data set for the upland remedial investigation and source control work together with the sediment trend analysis in the LWG Round 2 Report indicates the Arkema property is not a source for these COIs (e.g., PCBs, lindane, and dioxin).

Kriging/Site Characterization/Data Gaps Analysis

Going forward, LSS will be using the 3D analysis for further Site characterization and decision making. Although LSS is willing to agree to leave the 2D analysis in the Work Plan, we reiterate our concern that the 2D analysis is inadequate, does not meet current technical standards, and is not particularly useful for the purposes of the EE/CA.

Technology Screening and Analysis

EPA's apparent decision to limit the EE/CA technologies to be evaluated for the Arkema site is based on presupposed removal actions for the site (i.e., "capping may be considered to address limited conditions..." and "mechanical dredging without hydraulic containment does not meet EPA's protectiveness criteria..."). This approach is inconsistent and in fact is counter to EPA's Contaminated Sediment Remediation Guidance for Hazardous Waste Sites (EPA 2005). EPA's guidance specifically emphasizes that the feasibility analysis should be site-specific, as established by the following excerpts:

When evaluating alternatives with respect to effectiveness and permanence, it is important to remember that each of the three potential remedy approaches may be capable of reaching acceptable levels of effectiveness and permanence, and that site-specific characteristics should be reviewed during the alternatives evaluation to ensure that the alternative selected will be effective in that environment. (page iii, EPA 2005)

Where a remedy is necessary, the best route to overall risk reduction depends on a large number of site-specific considerations, some of which may be subject to significant uncertainty. Any decision regarding the specific choice of a remedy for contaminated sediment should be based on a careful consideration of the advantages and limitations of each available approach and a balancing of trade-offs among alternatives. (page v, EPA 2005)

Furthermore, EPA's seventh risk management principle (from EPA's 11 risk management principles for sediment sites, EPA 2002) states "Select site-specific, project-specific, and sediment-specific risk management approaches that will achieve risk-based goals."

These excerpts from EPA guidance show that a preconceived site remedy based on broad generalities (that in some cases are inaccurate) is inappropriate and counter to EPA's extensive experience and guidance with similar sites and EPA's stated preference for incorporating site-specific data into an adaptive management approach for sediment sites. Therefore, LSS believes it should evaluate a full range of technologies for the Arkema EE/CA site removal action based on site specific data.

PTM/RAA Boundary Definition

LSS understands and agrees with EPA's proposal to remove the term "PTM" in relation to the SLVs (1 x PEC and 1,000 x bioaccumulation SLV), and to leave the preliminary RAA boundary as drawn on the map attached as Appendix A to the AOC.

However, EPA has raised new issues that need to be addressed in its disagreement with LSS's July 13, 2007 critique of EPA's PTM analysis. Consequently, LSS believes it is necessary for the record to clarify our position and provide our response to specific aspects of EPA's August 28, 2007 analysis of SLVs.

The 0.035 ug/kg dw SLV is not site-specific.

LSS acknowledges EPA's agreement that the 0.035 ug/kg dw SLV (now 0.04 ug/kg) is a generic, non-site specific screening value.

The 0.035 µg/kg dw SLV is technically inaccurate.

With one exception, EPA's response acknowledges the accuracy of LSS statements concerning degradation of DDX compounds. The exception is the complete omission of DDD and the fact that it does not degrade to DDT. In essence, EPA's response is that the 0.035 ppb value is "health protective, for screening purposes" and "reasonably accurate and conservative." LSS agrees that this value is protective based on inherent conservative assumptions built into its calculation. However, LSS believes that the degree of conservatism may be extreme and, therefore continues to reserve judgment concerning its accuracy.

The BSAF used to convert the ATL to a concentration in sediment is not chemical specific, is out of date, and is biased.

EPA acknowledges that the BSAF values originally generated by DOH (1995) and used by DEQ (2007) are not chemical specific. Nevertheless, EPA reiterates its use and support of the DOH (1995) BSAFs through comparisons of DEQ (2006a) and DEQ (2007) versions of the bioaccumulation guidance, arguing that they are "health protective" and therefore are not considered to be "biased." BSAFs and their sources from the DEQ (2006a) and DEQ (2007) documents are shown in Table 1. It is obvious from Table 1 that DEQ elected to use an older source of information (DOH 1995 vs. USACE 2006) in revising the preliminary guidance. It is also apparent that the BSAFs for DDD and DDT derived from DOH (1995) are 5 to 12 times higher than those from USACE (2006). As noted by EPA, the BSAF for DDE derived from DOH (1995) is marginally lower than that from USACE (2006). The net effect of these revisions is a one-size-fits-all BSAF that may be a reasonable upper bound estimate for DDE, but seems to vastly overpredict bioaccumulation of DDD and DDT.

Table 1. Comparison of BSAFs recommended by DEQ (2006) and DEQ (2007).

Chemical	DEQ (2006)		DEQ (2007)	
	BSAF	Source	BSAF	Source
DDD	4.5	USACE (2006) ^a	24	DOH (1995) ^b
DDE	32	USACE (2006)	28	DOH (1995)
DDT	2	USACE (2006)	24	DOH (1995)

^aAs cited by DEQ (2006)

^bAs cited by DEQ (2007)

LSS agrees that such values are indeed health protective for screening purposes. However, LSS does not agree that these values are representative or appropriate for a site-specific evaluation of human health or ecological risk.

As stated in its specific comments in Attachment 1 to the July 13 comment letter to EPA, LSS believes that the DEQ (2006a) guidance document was obviously a preliminary version of the draft guidance document that was released in September 2006 by DEQ (2006b)(Public Review Draft Guidelines for Assessing Bioaccumulative Chemicals of Concern in Sediment), which was subsequently revised pursuant to peer review and comment and released in final form January 31, 2007 and updated in April 3, 2007. Consequently, at this point LSS has no desire to revisit DEQ (2006a,b) values and requests that the final January 31, 2007 DEQ (2007, as amended) guidance document be the foundation for any future bioaccumulation values as stated in the rules for site-specificity that are provided in Section 4.2 of that document.

EPA also states that “for DDX compounds, the calculation of BSAF values is complicated by the metabolism of DDT to DDE and DDD, which may make it difficult to relate sediment concentrations to fish tissue concentrations.” LSS is aware of metabolic pathways and metabolic half-lives associated with such conversions; however, LSS is not aware that metabolic properties, particularly for chlorinated pesticides with relatively long metabolic half lives, have complicated or somehow precluded such calculations. If the intent of this statement is to express uncertainty in the linear relationship between DDX in sediment and fish tissue, then LSS questions the basis for EPA’s confidence in the SLVs currently being promulgated as cleanup levels for early action, which is based on the same linear relationship.

The 0.035 µg/kg dw SLV is inconsistent with the Portland Harbor RI/FS human health risk assessment.

EPA states that “Arkema chose some of the least health protective iPRGs in the Round 2 Report to use for this comparison – those based upon non-cancer effects for tribal child consumption of multiple fish species, including non-resident fish.” This statement is inaccurate for the following reasons:

1. The non-cancer values were lower than the cancer values, and were intended as starting benchmarks to estimate principal threat levels.
2. All species of fish are resident (carp, crappie, bullhead, bass) (See p. 10-18, Table 10.3-5 in the Round 2 Report.).

With respect to non-tribal consumption of bass, LSS does not dispute that there are other iPRGs available in the Round 2 Report that could be used as screening level benchmarks for the Arkema site. However, EPA’s response misses the point, which is that LSS provided an analysis of tribal subsistence using site-specific data that was directly comparable to DEQ’s 0.04 ug/kg screening value as indicated by the words “subsistence” and “tribal” in Tables A-1 and A-3 of DEQ’s (2006, as amended) guidance document. In other words, the analysis was conducted such that an “apples to apples” comparison could be made between the two SLVs.

PEC Values Used in the May 11, 2007 Work Plan for DDX Compounds

LSS acknowledges the differences in the PEC values for total DDT, DDD, and DDE. However, EPA's judgments based on the relative agreement among the isomers and supporting sample sizes seems selective and without well reasoned criteria for selecting or rejecting individual values.

EPA indicates that PECs for individual DDX compounds are in agreement with the $1,000 \times$ bioaccumulative SLV. This criterion seems to equate benthic community exposure with human exposure via consumption of fish. LSS does not believe that the toxic mechanisms and modes of action among such disparate taxonomic groups have been sufficiently evaluated to make such a determination. Consequently, LSS does not believe that there is a strong technical or scientific foundation for using an arbitrary multipliers to gain concordance between disparate SLVs that are based on different exposure organisms and endpoints.

EPA argues that the total-DDT PEC based on a geometric mean of three benchmarks is substantially out of line with those for individual DDx compounds. At best PECs are based on a geometric mean of five published benchmarks, but many (mercury and all of the organochlorine pesticides) are based on only three or four such benchmarks. Three published benchmarks were used to establish the PEC for DDT and four published benchmarks were used to establish the PEC for DDD and DDE. The methods for establishing these benchmarks are entirely empirical and encompass a high degree of variability. The fact that the total-DDT PEC does not agree with individual DDx PECs is an expression of the inherent variability of such heuristic methods and is no reason to disqualify it as another sediment benchmark.

EPA states that the relatively small amount of toxicity data to derive the total-DDT PEC is considered to have resulted in an elevated, less reliable value. The data requirements expressed in this statement are not entirely clear to LSS. The freshwater BEDs database that was used to develop the PELs contains 42 values for total-DDT, 275 for DDD, 277 for DDE, and none for DDT. However, the PEL is only one of the benchmarks used to develop PECs and does not account for all of the data. To assess predictive ability of PECs, MacDonald et al. (2000) evaluated 110 samples for total-DDT, 96 for DDT, 168 for DDD, and 180 for DDE. MacDonald et al. (2000) required 75% accuracy for predicting toxicity in 20 or more samples. Fewer than 20 samples were predicted to be toxic for DDD, DDT, and total-DDT. Consequently, MacDonald et al. (2000) concluded that there were insufficient data to evaluate the PECs for these substances. In summary, based on these scales of data quantity, DDE appears to be the only chemical with an acceptable PEC.

LSS agrees that supporting information should be evaluated critically, and that such evaluations should apply to all chemicals of interest. More importantly, LSS questions why harbor-specific sediment quality values developed by LWG are not included as benchmarks for benthic community toxicity. Because EPA's letter is silent on this issue, LSS assumes that EPA has no objection to incorporation of the harbor-specific sediment benchmarks in judging potential risk to benthic organisms.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

August 28, 2007

Reply To
Attn Of: ECL-110

Mr. Todd Slater
Legacy Site Services, LLC
468 Thomas Jones Way
Exton, PA 19341

Subject: Response to LSS letter dated July 13, 2007

Dear Mr. Slater:

This letter responds to issues and suggested resolutions in a Legacy Site Services (LSS) letter dated July 13, 2007. The LSS July 13 letter was prepared in response to an agreement during the June 26 meeting between EPA and LSS staff. (The July 13 letter included an attachment summarizing LSS' detailed comments on the May 11, 2007, EE/CA Work Plan). If resolution of the key issues identified in LSS' July 13 letter is reached, further discussion and response to LSS' attachment will be conducted. The enclosed response to the July 13 cover letter is presented in the same format as that letter. It is hoped that this response will move the project towards resolution of the formal dispute.

Please contact me at (206) 553-1220 or via e-mail at sheldrake.sean@epa.gov to discuss possible dates for a teleconference or meeting to resolve these primary issues at your earliest convenience.

Sincerely,

Sean Sheldrake, RPM

Enclosure

Cc:

Audie Huber, Umatilla Tribe
Brian Cunninghame, Warm Springs Tribe
Erin Madden, Nez Perce Tribe
Sheila Fleming, Ridolfi
Jeff Baker, GrandeRonde Tribe
Tom Downey, Siletz Tribe
Rob Neely, NOAA
Jeremy Buck, USFW
Greg Smith, USFW
Jim Anderson, DEQ
Matt McClincy, DEQ
Mike Poulsen, DEQ
Jennifer Peterson, DEQ
Rick Kepler, ODFW
Cyril Young, DSL
Lori Cora, EPA
Chip Humphrey, EPA
Eric Blischke, EPA
Kristine Koch, EPA
Rene Fuentes, EPA
Joe Goulet, EPA
Dana Davoli, EPA
Deb Yamamoto, EPA
Nancy Munn, NOAA-NMFS
Preston Sleeper, USDOJ

via email only

Enclosure

Resolution of Disputed Directed Changes

EPA accepts the May 11, 2007, EE/CA Work Plan to represent EPA's position on progressing with the early action removal project. However, EPA is willing to consider minor revisions to respond to LSS comments.

Chemical Driver for Removal Action

EPA concurs that DDX is the primary driver for delineating the Removal Action Area (RAA). However, EPA maintains that the COIs presented in the EE/CA Work Plan need to be analyzed in the sampling undertaken to fill data gaps for adequate characterization of the site. The final COI analyte list can be refined in consultation with EPA during the development of the QAPP. Analytes currently considered for removal from the COI analyte list are chloride and perchlorate. Furthermore, EPA maintains that cleanup levels (to be determined in the EE/CA) shall be developed for the final QAPP COI list in order to assess residual risk for final remedial action evaluation after the Portland Harbor ROD is issued.

Technical Comments Requiring Resolution

The May 11, 2007, EE/CA Work Plan substantially addresses EPA's comments presented in the September 21, 2006, work plan disapproval letter to LSS. EPA's September 21 comments were relevant to LSS's July 14, 2006 revised Work Plan and will remain as comments on that document. EPA did not set different standards for LSS. EPA's May 2007 Work Plan addresses in substance and scope the primary deficiencies that EPA identified with LSS's July 2006 Work Plan. LSS can be assured that EPA's May 11, 2007 Work Plan is deemed a sufficient Work Plan to continue the EE/CA process for the Arkema early action.

CSM/COI Attributes to Arkema

EPA agrees to replace the recreational user exposure scenario with the trespasser scenario. This revision will provide consistency with previous exposure scenarios developed during Remedial Investigation studies. However, institutional controls will need to consider recreational users and will need to be improved, as necessary.

It is EPA's intent to maintain consistency with the Harbor-wide CSM. Therefore, EPA does not accept the proposal to replace the CSM that is currently in the EE/CA WP. During the July 20 conference call, LSS proposed submitting a Portland Harbor CSM highlighted to depict specific Arkema site conditions. EPA will review this revised CSM and consider it for inclusion into the EE/CA Work Plan.

EPA accepts the LSS proposal to remove the AMEC reference. However, as discussed, the exclusion of the AMEC data reference could result in additional EE/CA data gaps. In addition, biota TCDD data from the Arkema RI/FS will be added to the EE/CA WP to document the presences of dioxin/furans at the Arkema site.

Source Evaluation/Recontamination Potential

EPA concurs with LSS' assertion that certain COIs have additional sources within Portland Harbor. However, contaminant concentration patterns in surface sediments and in sediments at depth along the length of the Arkema site suggest that Arkema site sediment currently is a potential source for PCBs, lindane, and dioxin/furan to Portland Harbor. EPA also concurs with LSS' assertion that ongoing sediment transport may be a source of recontamination potential for certain COIs. The preceding language is what EPA would be willing to place in the Work Plan.

Kriging/Site Characterization/Data Gaps Analysis

EPA considers the 2-D kriging to be adequate for identifying data gaps and would not agree to remove it from the Work Plan. However, EPA also considers the LSS-proposed data gaps analysis (based on a 3-D kriging model) appropriate as a supplement to the work plan, subject to review and acceptance by EPA. The 3-D kriging model is recognized as a beneficial tool for evaluations later in the EE/CA process as a more complete data set is developed.

Technology Screening and Analysis

EPA accepts that remedies other than those listed in the EE/CA Work Plan may be considered but for limited applications and with certain restrictions which were mentioned in the May 2007 Work Plan. Capping may be considered to address limited conditions, such as post-dredging capping, localized isolation capping, and fringe area capping.

Mechanical dredging without hydraulic containment does not meet EPA's protectiveness criteria given the types of contaminants and concentrations found in Arkema sediment. EPA maintains that mechanical dredging would be considered, but only when combined with rigid hydraulic containment of the dredge area. EPA concurs that an environmental dredge bucket has the potential to limit water quality impacts when compared to a conventional clamshell bucket. However, based on existing information about the amount of debris in Arkema sediment, it is expected that the environmental dredge would perform no better than the conventional clamshell bucket. EPA maintains that an environmental dredge bucket can be analyzed but it would have to be analyzed in the context of site conditions and assessed with the same hydraulic control requirements as for a conventional clamshell bucket.

EPA maintains that on-site upland disposal (assuming it is Arkema's property) may be technically feasible, but would likely have very high costs to provide adequate protection from releases. State, local, or community acceptance may also be difficult as such a concept has the potential to limit water dependent uses for which the property is currently zoned. EPA accepts that on-site upland disposal be retained for screening of alternatives.

PTM Definition/RAA Boundary

1. The 0.035 µg/kg dw SLV is not site-specific.

This is correct; the DEQ bioaccumulative screening level value (SLV) for DDX was developed as a generic screening value, and is not site-specific. EPA maintains that the 0.035 µg/kg SLV is appropriate to serve as a screening value for use in the EE/CA WP. Use of generic SLVs is considered appropriate for this point in the EE/CA process and is consistent with EPA's NTCRA guidance. Note that in an April 3, 2007, update to the guidance, DEQ revised and rounded the value to 0.04 µg/kg. See also, response to No. 4 below.

2. The 0.035 µg/kg dw SLV is technically inaccurate.

The SLV for "DDT (Total)" in DEQ's SLV bioaccumulation guidance is based upon DDE but applied to all DDX (i.e. all isomers of DDT, DDE, and DDD). Arkema asserts that use of this SLV for all DDX is technically inaccurate "in terms of fate and transport pathways and also in terms of toxicity response values" for DDT, DDE and DDD. EPA disagrees and maintains that the 0.035 µg/kg DEQ SLV for DDX is technically accurate for use as a screening value in the EE/CA WP. DEQ considers the assumptions used to develop the DDX SLV to be appropriately health protective for screening purposes. DDT can be degraded in the environment or metabolized in fish (and humans) to DDE. So even if DDT is present in sediment, humans may be exposed to DDE by consuming fish. The data from near the Arkema site show that although DDT is the most prevalent DDX chemical found in sediment, DDE is the most prevalent chemical detected in fish tissue. This may be the result of metabolism of DDT to DDE in fish tissue, although other mechanisms such as preferential uptake may also be at work. Given the similarity of BSAF values (24 kg oc/kg lipid for DDD and DDT, and 28 kg oc/kg lipid for DDE) and cancer slope factors (0.34 [mg/kg/day]⁻¹ for DDE and DDT, and 0.24 [mg/kg/day]⁻¹ for DDD), DEQ considered it reasonably accurate and conservative to assume that the DDX compounds could be evaluated as a total.

3. The BSAF used to convert the ATL to a concentration in sediment is not chemical specific, is out of date, and is biased.

EPA maintains that the 0.035 µg/kg SLV is appropriate to serve as a screening value for use in the EE/CA WP. Use of generic SLVs from Table A-1 of DEQ (2007) is considered appropriate for this point in the EE/CA process. For consistency, DEQ decided to use a regional database of BSAF values in developing SLVs. DEQ acknowledges that the Washington Department of Health (DOH) values are not chemical-specific. DEQ reviewed the U.S. Army Corps of Engineers database, and proposed to Arkema a chemical-specific BSAF value of 32 kg oc/kg

lipid for DDE in a memorandum dated 22 March 2006. This value is the 90th percentile of the species data. In preparing state-wide guidance, DEQ considered it appropriate to use the similar but slightly less conservative BSAF value of 28 kg oc/kg lipid for DDE based on the 75th percentile using chemical class and Kow. There may be sufficient chemical-specific data, but DEQ agreed with the conclusion that "DOH feels that surrogate BSAF values based on Kow or chemical class and Kow will provide adequate protection and will be scientifically defensible." Also, for DDX compounds, the calculation of BSAF values is complicated by the metabolism of DDT to DDE and DDD, which may make it difficult to relate sediment concentrations to fish tissue concentrations. The use of an upper percentile is health protective (conservative), but in this context, is not considered to be "biased."

4. The 0.035 µg/kg dw SLV is inconsistent with the Portland Harbor RI/FS human health risk assessment.

The Lower Willamette Group ("LWG") has recently completed its revised Round 2 Comprehensive Site Characterization Summary and Data Gaps Analysis Report. This report (referenced by Arkema) presents an evaluation of the data collected and compiled by the LWG through Round 2 of the RI/FS for Portland Harbor. The Report is currently being reviewed by EPA and its partners. The Round 2 Report includes risk based (cancer and non-cancer) initial preliminary remediation goals (iPRGs) that were calculated for sediment based upon the bioaccumulation of contaminants in sediment into biota that are likely to be consumed by humans. These sediment iPRGs range in value depending upon the population that is expected to be exposed (tribal, or non-tribal; child or adult), type of fish eaten, assessment of cancer risk or non-cancer health impacts, cancer risk level assumed, and exposure assumptions (e.g., fish consumption rate). In its letter to EPA, Arkema selected the iPRGs for tribal child fish consumption based upon non-cancer effects (230 ug/k/g for DDD, 40 ug/kg for DDE and 210 ug/kg for DDT) to compare to the DDX SLV (0.035 ug/kg) in ODEQ's guidance.

This comparison is inappropriate for many reasons. First, EPA maintains that it is premature to use Portland Harbor iPRGs at this time because they have not been reviewed and approved by EPA. Second, Arkema chose some of the least health protective iPRGs in the Round 2 Report to use for this comparison – those based upon non-cancer effects for tribal child consumption of multiple fish species, including non-resident fish. A more appropriate health protective iPRG for DDX from the LWG's Round 2 Report for comparison to the ODEQ SLV is that developed for the potential lifetime cancer risks from DDE for non-tribal fish consumers of bass, a fish that has a home range of about a mile. The iPRG value for bass is 0.055 ug/kg for a lifetime cancer risk of 10⁻⁶ at 142 grams/day fish consumption (see Round 2 Report, Table 10.3-3, non-tribal adult fish ingestion of small mouth bass, converted from 10⁻⁴ risk level assuming a linear relationship) as compared to the ODEQ SLV value of 0.04 µg/kg for a lifetime cancer risk of 10⁻⁶ at 142 grams/day fish consumption (subsistence fisher exposure scenario). Therefore, the ODEQ SLV is not inconsistent with the "Portland Harbor RI/FS human health risk assessment."

Solution: PTM Definition and RAA Boundary

EPA's Work Plan provides that the PTM be defined based on appropriate screening level values (SLVs) in compliance with regulatory guidance documents cited in Section 6.1.1 of the EE/CA Work Plan. The EE/CA WP calls for defining PTM as 1,000 x any bioaccumulative SLV or 1 x any PEC. Arkema's key issues were only directed to the bioaccumulative SLV, but specific comments addressed the PEC as well.

The PEC values used in EPA's revised Work Plan for individual DDX compounds (DDT @ 62.9 ppb, DDD @ 28 ppb, DDE @ 31.3 ppb) essentially results in the same SLVs as 1,000 x bioaccum SLV (1,000 x SLV = 40 ppb) which adds additional support for these SLVs as reasonable values by which to evaluate the boundary of the RAA for further EE/CA analysis. EPA does not accept the LSS proposed inclusion of the MacDonald et al. PEC of 572 µg/kg for total DDT (Attachment 1, Comment No. 13) for the following reasons:

- The total DDT PEC is based on the geometric mean of three published total DDX values that include a PEL of 4,450 µg/kg published by Smith et al. (1996). This total DDT PEL is substantially out of line with the PELs of 8.5 µg/kg for DDD and 6.8 µg/kg for DDE.
- The relatively small amount of toxicity data to derive the total DDT PEC is considered to have resulted in an elevated, less reliable value.
- It is not clear that the MacDonald et al. PEC of 572 µg/kg for total DDT is directly applicable to total DDX.

Arkema proposes that EPA remove the 1,000 x 0.035 ug/kg PTM definition (e.g., 40 ppb DDX) from the EPA Work Plan and in its place utilize the logical breakpoint of the mass-to-volume relationship as the default PTM definition for the site. Arkema indicated that all of the extensive screening and analysis performed in Section 6 can be retained.

For purposes of ending the long-standing dispute on the EE/CA Work Plan EPA has a counter proposal which we believe should address Arkema's concerns with the PTM definition. This counter proposal is being proffered to bring to completion all disputed issues on the Work Plan. If Arkema does not accept the offer, including dropping all disputed issues on the Work Plan, the counter proposal will be void.

EPA will agree to remove the term "principal threat material" in relation to the SLVs, 1 x PEC and 1,000 x. bioaccumulation SLV. We will not remove the SLVs from the Work Plan. Both the 1 x PEC and bioaccumulation SLV will be retained as risk screening levels for defining the basis for a dredging evaluation in the EE/CA. Additionally, EPA will agree that the preliminary RAA boundary as drawn on the map attached as Appendix A to the Administrative Order on Consent can constitute the outer boundary within which further EE/CA analysis and dredging evaluations will be conducted, including additional site characterization for data gaps. However, pre- and post-project biota and/or sediment data outside the RAA will be needed for recontamination/offsite migration analyses. [Please also note the preliminary RAA boundary includes outfall #4 which EPA considers a significant area that needs to be further characterized

and addressed by this removal action.] EPA acknowledges that sediment outside of this boundary, particularly in front of Lots 1 and 2, may exceed the SLVs; however, as Arkema stated in its July 13 letter, “we all agree, any material that remains outside of the RAA would still be subject to future characterization, risk assessment, and cleanup in accordance with the Portland Harbor RI/FS” and, we add, Record of Decision.

EPA accepts that the mass-to-volume relationship is a valuable tool for considering the implementability of technologies for the removal action. EPA encourages LSS to provide the mass-to-volume relationship as part of the EE/CA analysis and subsequent report. However, we cannot agree it will be the primary criteria for PTM.

EPA considers this counter proposal to provide Arkema with more certainty as to the scope of this removal action and will address the majority of the highest concentration contamination in front of the facility. We trust you will seriously consider this counter proposal so that the dispute on the EE/CA Work Plan will be ended and real work on cleanup can begin.



July 13, 2007

Mr. Sean Sheldrake
U.S. Environmental Protection Agency
1200 Sixth Avenue, ECL-111
Seattle, Washington 98101

**Subject: Response to June 26 Meeting and Proposed Resolution of Key Technical Issues
Arkema Portland Facility
U.S. EPA Region 10 Docket No. CERCLA 10-2005-0191**

Dear Mr. Sheldrake:

Legacy Site Services LLC ("LSS") would like to express its appreciation for EPA and the government team's attention, time and resources dedicated to our meeting in Seattle, Washington on June 26, 2007. This letter presents LSS' submittal that was agreed to at that meeting. We understand that LSS agreed to provide to EPA by July 13, 2007 a list of the key issues that require further technical resolution and discussion prior to finalization of the EE/CA work plan being developed pursuant to the above-captioned proceeding. At the June 26 meeting, EPA stated that one of its primary goals is ending the dispute on the draft EE/CA work plan. LSS agrees. With this common goal at the forefront, we have tried to state our concerns and also provide suggested paths forward in this letter in order to resolve all outstanding issues, wrap up all remaining disagreements, essentially tie up all loose ends, and end the formal dispute.

LSS and EPA also agreed at the June 26 meeting to a teleconference call, tentatively scheduled for July 20, 2007 to discuss the content of this letter and LSS' proposal for resolution of these comments. It is LSS' understanding that the intended outcome of the July 20th call will be an agreement on which, if any, technical issues still remain to be resolved and a schedule of teleconference calls or meetings to resolve them. We think this arrangement, as agreed to by both LSS and EPA and the government team at the June 26 meeting is an excellent, constructive path that will move the project forward and hopefully rapidly resolve the issues that remain in dispute.

Resolution of Disputed Directed Changes

As you know, LSS has disputed a number of EPA's directed changes ("Directed Changes") to the Arkema draft EE/CA work plan.¹ We believe these unresolved Directed Changes, including

¹ January 5, 2006 Letter to Lori Cora from Doug Loutzenhiser Re: Disputed Directed Changes to Arkema Draft EE/CA Work Plan; February 2, 2006 Letter to Lori Cora from Doug Loutzenhiser Re: Disputed Directed Changes to Arkema Draft EE/CA Work Plan; October 4, 2006 letter to Lori Cora from Doug Loutzenhiser Re: Dispute of EPA Decision to Invoke Section XIII,

July 13, 2007

Page 2

all related EPA suggested changes and comments, can be resolved without further formal process if EPA and LSS can come to accord on what we believe to be the key issues related to EPA's version of the Arkema draft EE/CA work plan prepared by Parametrix on behalf of EPA, dated May 11, 2007, titled *Arkema Early Action EE/CA Work Plan* (the "EPA Work Plan"). As expressed by both EPA and LSS representatives at the June 26 meeting, ending the dispute and moving on with the work is the best outcome we can achieve. LSS is committed to that outcome.

Whether we can resolve all of our disputed Directed Changes ultimately will depend upon our agreement on how to describe the principal threat material ("PTM") and removal action area ("RAA") for the site. What follows is first a discussion of a key issue we believe LSS and EPA agree upon; second, a general discussion and proposed solutions concerning the remaining key areas listed below; and finally, a discussion of the PTM definition and the RAA boundary. Attached to this summary are detailed comments, most if not all of which have their roots tied to these five remaining areas.

Chemical Driver for Removal Action

This is a summary of a key area that we believe LSS and the government team now agree upon for the Arkema early action site and how we arrived at that agreement.

In its original *Draft Engineering Evaluation/Cost Analysis Arkema In-Water Removal Action Work Plan* dated September 26, 2005, Arkema conducted a review and evaluation of chemicals at the Arkema site. This review focused on the chemicals of interest that were the subject of Arkema's Administrative Order on Consent (AOC) and included DDT, DDD, DDE, chlorobenzene, perchlorate, and chromium, but also included a summary of all chemicals that had been analyzed and detected at the site. The data set for the site included extensive investigations of the former DDT manufacturing facility that operated on the property from about 1947-1954. As a result of this initial data analysis and evaluation of the conceptual site model, the September 26, 2005 draft EE/CA work plan focused on the initial removal action area which was primarily defined by the distribution and mass of DDx at the site. EPA rejected Arkema's analysis and indicated that additional data analysis, including figure presentations, would be required for a much larger list of chemicals at the site.

In response to EPA and the government team's comments on the September 26, 2005 draft EE/CA work plan, LSS' *Revised Draft Engineering Evaluation/Cost Analysis Arkema Removal Action Work Plan* dated July 14, 2006 (the "LSS Revised Work Plan") included a greatly expanded data analysis and conceptual site model development, including the presentation of 49 chemicals detected at the site in more than 350 maps and figures in the work plan. Although the additional in-depth analysis of numerous other chemicals was extensive, the preliminary RAA was still primarily driven by the footprint of the primary DDx² mass at the site (see for example, Figure 6-1 from the LSS Revised Work Plan). EPA rejected this analysis and preliminary RAA boundary.

Paragraph 22 of AOC and Continue Dispute of Directed Changes; October 30, 2006 Letter to Daniel D. Opalski from Doug Loutzenhiser Re: Revised Draft EE/CA Work Plan and Unresolved Directed Changes.

² DDx is the sum of the various isomers of DDT, DDD, and DDE.

The EPA Work Plan presents content and a format that is acceptable to EPA. As part of the data analysis and in an effort to define an RAA boundary, Parametrix generated a grid of the analysis area and generated figures based on screening level value ("SLV") exceedances for various chemicals within the analysis area. At the conclusion of this analysis, Parametrix determined that the area delineated by DDx incorporated the areas for all other chemicals analyzed. This result is highlighted in the following paragraph from Section 6.2 of the EPA Work Plan, which states:

Comparison of the maximum exceedances of any sediment SLV by any COI (Figure 6-1a) with the pattern of exceedances of bioaccumulative SLVs (Figure 6-3a and 6-3b) and PEC SLVs (Figure 6-4) by DDx compounds *indicates that the areal extent of PTM is driven by DDx.* (Emphasis added)

and later reinforced by another paragraph in Section 6.2 of the EPA Work Plan, which states:

Exceedances of the PEC SLVs by DDD, DDE, DDT (Figure 6-4) are similarly accounted for by the distribution of SLV exceedances in Figure 6-2a, with the distribution of PEC SLVs in Figure 6-2a being more generally uniform across the site than is seen in the other distribution figures. Examination of exceedances of bioaccumulative SLVs and PEC for all COIs other than DDD, DDE, or DDT (Figures 6-5 and 6-6) show that *basing PTM primarily on the distribution of DDx compounds exceedances adequately accounts for the distribution of PTM as defined in Section 6.1.2.* (Emphasis added).

Based upon this language from the EPA Work Plan and discussions at our June 26th meeting, LSS and EPA are in agreement that DDx is the driver for determining the extent of PTM, delineating the RAA Boundary, and focusing the EE/CA process.

Technical Comments Requiring Resolution

Attached to this letter is a comprehensive list of LSS' review comments on the EPA Work Plan. Of this comprehensive list, LSS has identified only five key areas that require further technical discussion, and those areas (including the "Chemical Driver for Removal Action" described above) encompass the remaining Directed Changes currently in dispute. The five key areas include:

- CSM/COIs Attributed to Arkema
- Source Evaluation/Recontamination Potential
- Kriging/Site Characterization/Data Gaps Analysis
- Technology Screening and Analysis
- Removal Action Area Boundary/Principal Threat Material Definition

The technical issues and proposed solutions related to each of these key areas are summarized below. Please note that these summaries include only examples of the problems and proposed solutions that fall within the five key areas; they are not the exclusive set of problems and

solutions. LSS intends that each "A" priority comment in the attached Table be addressed individually. Also, LSS notes that a significant number of the "non-responsive" comments included in EPA's September 21, 2006 letter³ disapproving the LSS Revised Work Plan are not addressed in the EPA Work Plan. Many of these comments included requirements that have not been met in the EPA Work Plan although these requirements were the basis for EPA's decision to disapprove and reserve to itself modification of the LSS Revised Work Plan. It appears that EPA has set different standards for Parametrix and LSS, and because LSS seeks assurance that the EPA Work Plan is sufficient to meet all EPA standards and will not be modified after these current negotiations are completed, LSS requests that EPA withdraw all of the "non-responsive" comments that are not addressed in the EPA Work Plan. LSS has identified all of these comments in the attached Table.

CSM/COIs Attributed to Arkema

Problem.

The EPA Work Plan attributes site uses, pathways, and chemicals to the Arkema site that are not supported by the data. For example, recreational use of the site has not been documented even though EPA has apparently observed a trespasser on the beach on the neighboring property. The Arkema site is posted. "No trespassing" signs are installed in clear view along the limited beach area of the property. "Visitors" to the site, if any, would be considered trespassers in accordance with standard risk assessment exposure factors.

Solution.

LSS proposes that the site trespasser scenario be retained for the beach on the Arkema site and the site recreational user exposure pathway be removed from consideration. The existing institutional controls prohibit any kind of trespass. In addition, any hypothetical future recreational users that might visit the site would be considered trespassers and the exposure factors for trespassers would cover the potential exposure of future trespassers using the beach area.

Problem.

Certain pathways of exposure, for example seeps, are listed in the EPA Work Plan as both a "complete and significant pathway" and as "not present on the Arkema site and are therefore not considered in EE/CA."

Solution.

LSS proposes removal of the Portland Harbor Conceptual Site Model figures from the EPA Work Plan and replacing them with the figures from the LSS Revised Work Plan which, in response to earlier EPA comments, were modeled on the Portland Harbor figure, but were also

³ September 26, 2006 Letter to Todd Slater from Sean Sheldrake Re: Comments on Arkema revised draft EE/CA work plan dated July 14, 2006.

constructed to be specific to the Arkema site. The figures from the LSS Revised Work Plan are current and do not contain inaccurate information that could be confusing and misconstrued by the reader as applicable to the Arkema site.

Problem.

The EPA Work Plan cites a letter from an environmental consultant, AMEC, who is employed by StarLink Logistics Inc. ("SLLI"), a property owner near the Arkema property whose groundwater has contaminated Arkema's property and whose interests are adverse to Arkema. AMEC has drawn conclusions that do not appear to have come from a report that has undergone any type of peer review. LSS strongly disagrees with AMEC's means, methods, and conclusions. LSS' investigation into this issue is on-going; however, conclusions from any source that LSS has not examined to judge its validity and has not been appropriately vetted by qualified peers should not be included in the EPA Work Plan.

Solution.

Delete the reference to the AMEC letter in the EPA Work Plan.

Source Evaluation/Recontamination Potential

Problem.

The EPA Work Plan attributes chemicals (e.g., PCBs, PAHs, dioxin, lindane) to the Arkema site that are not specifically Arkema COIs and are widespread throughout Portland Harbor. Because of the nature of sediment deposition and transport within the Portland Harbor, the presence of a chemical in sediments in front of the Arkema site does not necessarily mean that the chemical was derived from a source on the Arkema site.

Solution.

LSS proposes that the wording for these chemicals in the EPA Work Plan be changed to indicate that all of these chemicals are found in sediments upriver of the Arkema site and throughout the Portland Harbor. In addition, recontamination from ongoing sediment particulate transport is the most likely source of recontamination potential of these COI's to the RAA.

Kriging/Site Characterization/Data Gaps Analysis

Problem.

The EPA Work Plan presents a two-dimensional kriging analysis that results in broad, sweeping conclusions about data that are inaccurate. LSS has found that the two-dimensional kriging isopleths maps do not meet the definition of "isopleths maps" because, in many cases, the "isopleths" include data that are outside of the appropriate data range. In addition, the search radius based upon two points that was used in the two-dimensional data kriging analysis is not adequate given the data density, and the poor agreement between the data input and the figure

output distorts the accurate representation of site conditions. LSS also is concerned about the statement that the “grid cells are still accurately portraying the estimated concentration...”⁴ (We note that Parametrix recanted this statement at the June 26 meeting.) When the input sample data grossly differ from the resulting prediction, as they do in the EPA Work Plan figures, a high degree of uncertainty and a low degree of confidence is indicated. In addition, LSS is concerned that the artificial separation of sample points into four unequal horizontal planes in the two-dimensional kriging further skews the results such that the power of the weighted averaging of neighboring sample pairs in the kriging analysis is limited and the value of the spatial distribution of the sample points is lost or marginalized. Based on these technical concerns, LSS considers the power of the two-dimensional kriging to be lost in the data gaps analysis and evaluation of additional site characterization.

Solution.

LSS proposes that the two-dimensional kriging analysis and figures be removed from the EPA Work Plan. LSS has completed three-dimensional kriging of total DDx that accurately represents the data, has appropriate spatial weighting, and that honors every data point in the analysis area. LSS proposes using figures for total DDx that are derived from its three-dimensional kriging analysis. LSS also proposes to use the drill guide tool in the EVS software to aid in the analysis of data gaps and site characterization needs for the purposes of completing the sediment investigation work.

Technology Screening and Analysis

Problem.

The EPA Work Plan has eliminated or marginalized several viable sediment remediation and disposal technologies including thin-layer placement, isolation capping, mechanical dredging, and onsite disposal. Each of these are viable technologies which, when combined into an appropriate sediment remediation alternative, could be effective and appropriate for use in some portions of the RAA. It is also unclear why at the draft work plan stage of the EE/CA, any of these viable technologies would be eliminated from consideration given that they are known to be effective and applicable at other sites.

Solution.

LSS proposes that these technologies be retained for consideration in the technology evaluation and the development of remedial action alternatives. The National Contingency Plan (“NCP”) screening alternatives (effectiveness, implementability, and cost) and the nine detailed evaluation criteria will be used to compare and analyze the preferred remedial alternative in the EE/CA.

⁴ February 13, 2007 Technical Memorandum to File from Craig Haney Re: Development and Construction of Chemicals of Interest Isopleth Maps (Attachment B to EPA Work Plan).

PTM Definition/RAA Boundary

Review of Mass Removal Analysis.

LSS would like to again thank the government team for allowing LSS to present the mass removal approach that LSS developed for the Arkema site. In summary, the approach uses different DDx mass-to-volume relationships to define the breakpoint in the data that correlates with the practicable effectiveness of the removal action that will be evaluated in the EE/CA in accordance with the criteria in the NCP. Based on LSS' initial analysis of approximately 230 sediment sample data points at the Arkema site, the breakpoint in the DDx mass that can be practicably addressed in the EE/CA is approximately ± 90 percent of the DDx mass. At the June 26 meeting, we understood that EPA agreed to include the mass removal analysis approach as a modification to Section 7 of the EPA Work Plan that will be utilized as a tool to define the RAA.

Problem: PTM Definition.

At the June 26 meeting, EPA proposed that EPA's PTM definition of 0.035 mg/kg total DDx be left in the work plan even though LSS disagrees with the technical basis for the development of this screening value. At the meeting, EPA and LSS tentatively "agreed to disagree" about this value's presentation in the EPA Work Plan. In internal discussions since the meeting, we have taken to heart EPA's advice and desire to resolve all outstanding issues, wrap up all remaining disagreements, essentially tie up all loose ends, and end the formal dispute. However, after protracted internal discussions, and careful analysis, LSS has reluctantly concluded that it cannot leave the PTM disagreement in an "agree to disagree" mode, because it is an issue that could unravel the forward progress of the removal action at any time. LSS cannot agree to the establishment of EPA's PTM value for the site because of the flawed technical basis for this SLV/RAO, the potential inconsistency with the Portland Harbor RI/FS work, and the inability to distinguish areas of "principal threats" from the Arkema site versus other sites and background conditions both up and downriver in the Willamette River. At EPA's request, we did not discuss the PTM definition at the June 26 meeting. Because we have come to the conclusion that, in good faith, we cannot "agree to disagree" concerning the PTM definition in the EPA Work Plan, we present here a detailed analysis of our concerns.

EPA identifies an SLV of the 0.035 ug/kg dry weight (dw) sediment as the most conservative SLV for the protection of human health via subsistence consumption of food. EPA also indicates that although this screening level is based on DDE, it is broadly applicable to the sum of all DDx isomers because all isomers will eventually convert to DDE. There are a number of technical problems with the SLV value and the assumption that it is applicable to the sum of all DDx isomers. This value is neither site- nor chemical-specific, is technically inaccurate, is out of date, and is inconsistent with the results of the human health risk assessment developed at EPA's direction for the Portland Harbor RI/FS.

1. The 0.035 ug/kg dw SLV is not site-specific.

The 0.035 ug/kg dw value is taken directly from Table A-1 of DEQ's (2007) *Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediments* (the "DEQ Guidance"). As

discussed in Section 4.1 of the DEQ Guidance, this Table summarizes generic screening level values that are based on conservative assumptions intended to screen chemicals of interest at any site. These assumptions fall into two general categories:

- (1) determination of generic acceptable tissue levels (ATLs) in fish, which are calculated using standard equations that relate health risk to chemical concentrations in fish and rates for subsistence consumption of fish; and
- (2) determination of a screening level value in sediment, which is calculated by dividing the ATL by Biota-Sediment Accumulation Factors (BSAFs) and making further adjustments based on the presumed lipid content of fish and the organic carbon content of sediments.

The DEQ Guidance provides for determination of site-specific screening levels “by modifying one or more of the parameters in the exposure equations used to develop the generic ATLs and SLVs based on site-specific conditions or collection of site-specific data such as fish tissue concentrations or laboratory or in-situ bioaccumulation tests.” However, none of these adjustments were conducted by EPA, and therefore, the SLV is not site-specific in accordance with the DEQ Guidance.

2. *The 0.035 ug/kg dw SLV is technically inaccurate.*

EPA also indicates that although this screening level is based on DDE, it is broadly applicable to the sum of all DDX isomers, because all isomers will eventually convert to DDE. This is technically inaccurate in terms of fate and transport pathways and also in terms of toxicity dose-response values.

DDT can degrade to either DDD or DDE depending on environmental conditions (e.g., presence of oxygen) and the microbial community structure. DDE is the dominant transformation product in shallow oxic sediments and DDD is usually more abundant in deeper anoxic sediments. Both DDD and DDE can be further dechlorinated and degraded to a variety of metabolites including DDMU, DDMS, DDNU, DDOH, DDA, DDM, DBH, and DBP. Hence, all degradation pathways do not include DDE, nor is DDE a common intermediate in all degradation pathways.

The DEQ Guidance ATL for subsistence consumption is based on cancer risk. The cancer slope factor that is used to judge cancer risk is 0.34 for the 4,4'-isomers of DDE and DDT, and 0.24 for 4,4'-DDD. Consequently, applying the cancer slope factor for DDE to all of the constituents in DDx is inaccurate.

3. *The BSAF used to convert the ATL to a concentration in sediment is not chemical-specific, is out of date, and is biased.*

The BSAF that is used to convert DEQ's (2007) ATL to a sediment concentration is taken from a WDOH (1995) report. None of the values in that report are chemical specific. The report is based on three methodologies. Methods 1 and 2 are based on categorizing chemicals according to broad order-of-magnitude ranges of Kow values and selecting the 75th percentile values for

each class to calculate a BSAF.⁵ Neither Method 1 nor Method 2 is chemical specific and both are flawed because they assume that individual BSAFs do not vary substantially within these order-of-magnitude ranges. Method 3 uses empirical BSAF values for individual chemicals, which are chemical-specific and site-specific, and was WDOH's (1995) recommended approach.

The DEQ Guidance includes the highest BSAF values from among those available by Methods 1 and 2 with BSAFs of 24 for DDD and 28 for DDT and DDE. These values are highly biased. Contemporary compilations of BSAF values (e.g., COE Environmental Residue Effects Database) indicate that fish BSAF values are generally less than 5 for DDT and DDD, but average about 16 for DDE. Based on linear regression relationships, site-specific BSAF values for sculpin are less than 0.5 for DDT and DDD, and 1.4 for DDE. The DEQ Guidance states that parties have the option of either using the generic literature values or using site-specific BSAF values if data are available.

4. The 0.035 ug/kg dw SLV is inconsistent with the Portland Harbor RI/FS human health risk assessment.

The Lower Willamette Group ("LWG") has recently completed its revised Round 2 Comprehensive Site Characterization Summary and Data Gaps Analysis Report. This report presents an evaluation of the data collected and compiled by the LWG through Round 2 of the RI/FS for Portland Harbor. Much of the material in the Round 2 Report is relevant to perceived in-water risks associated with the Arkema site. In particular, the Round 2 Report develops very conservative risk-based initial preliminary remediation goals ("iPRGs") using data and receptors for Portland Harbor, including the Arkema site. The sediment iPRGs for tribal subsistence consumption of fish are 230 ug/kg dw for DDD, 40 ug/kg dw for DDE, and 210 ug/kg dw for DDT based on non-cancer hazard quotient of 1.⁶ Importantly, the human health risk assessment in the Round 2 Report, which is based on site-specific yet conservative assumptions, indicates that the Arkema site is not an Area of Potential Concern for Native American subsistence consumption of fish (Round 2 Report Section 8, Section 10, and Appendix F). Because these iPRG values are specific to the Portland Harbor site they would serve as better starting benchmarks for judging PTM than the proposed 0.035 ug/kg dw SLV.

Solution: PTM Definition and RAA Boundary.

LSS respectfully requests that EPA remove the 0.035 ug/kg PTM definition from the EPA Work Plan and in its place utilize the logical breakpoint of the mass-to-volume relationship as the default PTM definition for the site. LSS believes this can be done with some minimal modifications to Section 6 of the EPA Work Plan and that all of the extensive screening and analysis performed in Section 6 can also be retained. Based on the analysis thus far, the logical breakpoint in the mass-to-volume occurs at approximately ± 90 percent DDx mass. This percentage may fluctuate somewhat up or down based upon the collection and evaluation of the

⁵ Kow refers to the octanol-water partition coefficient, which is a chemical specific property correlated with a substance's potential to accumulate in tissues from water, including sediment pore water. Based on these correlative relationships, various equations have been developed in which Kow is used (along with a number of other factors) to estimate BSAFs.

⁶ These iPRG values were selected based on the lower of a cancer risk of 10^{-4} or an HQ of 1 for native American adult or child ingestion of fish (Table 10.3-5 in the Round 2 Report). Based on the lowest values for either adult or child, the iPRGs for cancer risk of 10^{-4} were higher than those for non-cancer HQ = 1.

data collected as part of the data gaps analysis/EE/CA site investigation. Accordingly, the RAA boundary would be further refined in the EE/CA site investigation through the collection and analysis of these additional sediment data in those areas that would help refine or better define the breakpoint in the mass-to-volume relationship. As we all agree, any material that remains outside of the RAA would still be subject to future characterization, risk assessment, and cleanup in accordance with the Portland Harbor RI/FS. Furthermore, the benefits from the removal action on the breakpoint in mass-to-volume (approximately ± 90 percent total DDX mass) at the Arkema site would be measurable, and subsequent monitoring data would be used to further evaluate any residual risk concerns at the site.

If EPA and the government team can agree to the LSS proposed solutions for the PTM definition and the RAA boundary, all of the current Directed Changes in dispute can be resolved and this project can move forward expeditiously. LSS is hopeful that EPA will find this a constructive path to resolution of the remaining disputed issues on the draft work plan. Please contact me at (610) 594-4430 if you have any questions or comments about the information in this letter.

Sincerely,

Legacy Site Services LLC



J. Todd Slater
Manager, Environmental Technologies
And Remedial Procurement

References Attached

cc: (electronic) James M. Anderson, Oregon DEQ
Rick Kepler, Oregon Department of Fish and Wildlife
Rob Neely, NOAA Coastal Resources Coordination
Dr. Nancy Munn, NOAA Fisheries
Jeremy Buck, US Fish and Wildlife
Preston Sleeper, US Department of Interior
Brian Cunninghame, Confederated Tribes of the Warm Springs Reservation of Oregon
Rose Longoria, Confederated Tribes and Bands of the Yakama Nation
Pete Wakeland, Confederated Tribes of the Grand Ronde Community of Oregon
Tom Downey, Confederated Tribe of the Siletz Indians
Audie Huber, Confederated Tribes of the Umatilla Indian Reservation
Erin Madden, Nez Perce Tribe
Jean Lee, Environment International Ltd.
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Matt McClincy, DEQ
Mike Poulsen, DEQ
Alex Cyril, DEQ
Cy Young, DSL
John Howland, Parametrix
Peter Battuello, Parametrix
Lori Cora, EPA
Chip Humphrey, EPA

References

DEQ. 2007. Guidance for Assessing Bioaccumulative Chemicals of Concern in Sediment. Oregon Department of Environmental Quality, Environmental Cleanup Program, Portland, OR. 18 pp. + appendices.

WDOH. 2005. Development of Sediment Quality Criteria for the Protection of Human Health. Tier I Report. Washington State Department of Health, Office of Toxic Substances, Olympia, WA. 27 pp. + appendices.

EPA Responsiveness Summary
Terminal 4 Removal Action
Portland, Oregon

Introduction -

This document summarizes and responds to the public comments submitted on the Engineering Evaluation and Cost Analysis (EE/CA) for the proposed Removal Action at the Port of Portland Marine Terminal 4 in Portland, Oregon.

The EE/CA was available for public review and comment from June 6 until September 7, 2005. Notice of this comment period was published in the Oregonian at the start of the initial 30-day public comment period. Notices announcing two subsequent extensions of the comment period were also published in the Oregonian. Additionally, notice of the comment period and a summary of the proposed EE/CA alternatives were described in a Portland Harbor Fact Sheet (June 2005) that was mailed to approximately 900 addresses.

Overview and general responses to all comments received

A total of eighty-nine responses were received during the public comment period. Seventy-four individuals, groups and businesses provided comments by letter and e-mail during the comment period. In addition, fifteen individuals provided spoken comment during the public meeting. Each submission was reviewed by the EPA project manager and other members of the Portland Harbor project team. Responses to all comments are provided below.

Many of the eighty-nine commenters provided feedback on more than one subject, resulting in over 450 specific comments.

CDF - One hundred forty-four comments referred to the proposed construction of a confined disposal facility (CDF) in Terminal 4 Slip 1. The largest group of these comments provided unqualified statements of opposition or concern about placing a CDF at Terminal 4. Many other respondents cited various reasons for having concern about the CDF. The most common concern stated was the ability of the CDF to withstand a catastrophic event such as earthquake or flood. Many respondents from the surrounding communities of St. Johns, Linnton and Cathedral Park, were opposed to the CDF because of the proximity to their homes. Other reasons cited by more than one respondent included leaching, erosion or leaking, the effect on fish and wildlife habitat, unknown or unspecified risk, and costs and economics. One comment stated support for the CDF.

EECA - Forty nine comments were about various aspects of the Engineering Evaluation and Cost Analysis. Several comments questioned how the alternatives were ranked, the adequacy of the analysis or the cost of the EECA or cleanup. Several comments identified missing information or requested additions they would like to see in the EE/CA. Approximately half of the comments related to the EE/CA asked for clarification or explanation from a specific page or section of the EE/CA.

Cleanup - Forty-four comments made generic statements about cleaning up the Willamette River, Portland Harbor or Terminal 4. About half of these comments expressed general support of EPA efforts to clean up the river. Several comments asked about the relationship of the Terminal 4 early action to the harbor-wide cleanup. Several comments identified cleanup concerns or priorities such as timing, cost, toxic materials, early actions, future use industrial use, contaminant migration, and objectives. (One comment asked EPA to continue this effort to clean up the Columbia and one comment support the OCEH plan to clean up the river.)

Landfill – Thirty six comments recommended that contaminated sediment dredged from the river should be disposed of in a hazardous waste landfill.

Alternatives – Thirty four comments related to alternatives presented in the EE/CA. Twenty-three comments were specific to the preferred alternative (Alternative C) identified in the EE/CA. Eight comments stated opposition to the preferred alternative, four comments expressed concern about the preferred alternative and the remaining comments related to the effect of the preferred alternative on fish, risk, cost or neighborhood concerns. Six comments urged EPA to select Alternative D and five comments asked to have additional alternatives developed.

Cost – Twenty four comments expressed concern over various aspects of the cost of the proposed action to the port or to the taxpayer.

Trust – Eighteen comments identified trust as an issue. Eleven comments talked about trusting the Port of Portland to do the right thing, three comments were specific about trust issues for EPA and four comments did not specify a party.

Disposal – Seventeen comments were regarding disposal of contaminated sediment and related issues such as capping, neighborhood concerns, and risk.

Monitoring – Fourteen comments questioned how the cleanup remedy would be monitored. One or more comments identified an aspect of monitoring such as fish and wildlife, strategy, or timing.

Public involvement – Twelve comments addressed the timing or adequacy of public involvement.

Risk – Nine comments identified risk as an issue or concern.

Dredging – Seven comments discussed dredging as part of the Terminal 4 Action. Three comments supported hydraulic dredging, and one comment was opposed to dredging.

Capping/Monitored Natural Recovery – Seven comments discussed capping and/or monitored natural recovery. Five comments supported these sediment cleanup tools and two comments opposed their use.

Economics - Four comments questioned the economics of the proposed action or analysis.

Other topics raised by one or two comments included: economics, mitigation, future use, treatment technology, air, human health, human use, neighborhood concerns restoration, sediment, and water quality.

May 11, 2006

ID	C#	Comment	Response
Golder	1	<p>NOTE: The entire Golder Report is not reproduced herein. The comments included below and responded to by EPA were taken from the conclusions of the report (Technical Issues 1 – 6).</p> <p>Issue 1: Seismic Design Regulations</p> <p>The technical memorandum states that “if the proposed CDF was regarded as a landfill, then Federal and Oregon state regulations will require” significantly higher level of seismic analysis and design than what was used in the EE/CA.</p>	<p>EPA agrees that if the CDF was regarded as a solid waste landfill, there are specific federal regulations on seismic analysis and design for those types of facilities. However, the CDF is not a landfill under Federal regulations. Also, the preliminary seismic analysis and design completed for the EE/CA (and which will be refined during the design of the CDF), was completed to standards set forth for other similar in-water facilities, which were determined by the Oregon Department of Environmental Quality (“DEQ”) to be comparable to requirements under potentially relevant state regulations.</p> <p>State and federal regulations governing solid waste landfills including, but not limited to, the Resource Conservation and Recovery Act (“RCRA”), 42 U.S.C. Section 6901, et seq., and 40 CFR Part 258 are not applicable or relevant and appropriate requirements (ARARs) for the siting, design and construction of the Terminal 4 CDF. Additionally, the contaminated sediment to be disposed of in the CDF at Terminal 4 are not hazardous wastes, thus, federal and state requirements related to hazardous waste disposal are not ARARs.</p> <p>Under the federal solid and hazardous waste program, sediment is an environmental media, and environmental media are not solid wastes, and thus are not hazardous wastes. However, if an environmental media contains a listed hazardous waste or exhibits a characteristic of a hazardous waste (40 CFR 261 Subpart C), it may need to be managed as hazardous waste depending on how it is handled and disposed. Nonetheless, dredged material, including environmental media such as sediments containing hazardous substances, that are managed and disposed under the requirements and protocols of the Clean Water Act, 33 U.S.C. Section 1251, et seq. are exempt from the definition of hazardous waste under the federal RCRA program, 40 CFR 261.4(g).</p> <p>Furthermore, the RCRA regulations related to the siting, design and construction of solid waste landfills are not well suited to CDFs for the following main differences:</p> <p>Subtitle D Landfills (solid waste landfills) are</p> <ul style="list-style-type: none"> • constructed in a land environment to receive a broad range of waste streams from the general public (e.g., municipal waste), and commercial and industrial operations. Although solid wastes do not exhibit the characteristics of hazardous waste (e.g., certain toxicity concentrations), these various wastes are typically contaminated with an unknown number of hazardous substances, many of them readily leachable. • Because the landfill is intended to be a land environment, when the waste in the landfill is exposed to moisture and air, it creates an environment in which they interact, decompose, oxidate and leach. Production of leachate and gas are natural consequences of these processes, and of landfills. • Due to the broad range of material accepted and the exposure of these wastes to moisture and air, landfills require liners and leachate collection and removal systems; run-on and run-off controls; and landfill gas collection systems. <p>In contrast, the proposed Terminal 4 CDF would be designed and constructed</p> <ul style="list-style-type: none"> • To contain stable, well-characterized contaminated sediment which exhibit inherently low leaching potential. Sediments (and soil/fill) are the only material that would be placed in the CDF. The type of sediment accepted is limited; acceptance criteria are developed specific to the site conditions and CDF design. • To accept sediments only. Since the sediments will not be mixed with various solid wastes, there will be no inter-reaction, oxidation, generation of leachate, or generation of gas that would warrant Subtitle D-like containment and monitoring systems. • To place the impacted sediments within a specific hydrogeologic setting (i.e., the saturated zone), which is not favorable for leaching to develop.

ID	C#	Comment	Response
			<p>• To withstand design-specific flood and seismic events. In general, the contaminants of concern only pose a chronic risk to aquatic receptors and any breach of the CDF leading to a release, although not likely, would not represent an immediate and significant danger to ecological receptors.</p> <p>In summary under federal law, the operational method, the type of material a CDF contains, the aquatic environment in which a CDF is sited, and the low-level risk that the sediment allowed to be placed in the CDF will represent is vastly different from those of landfills, therefore federal design or operational requirements for a solid waste landfill are not deemed relevant and appropriate for this response action.</p> <p>Oregon solid and hazardous waste disposal requirements also are not ARARs for this removal action, but for different reasons. Under Oregon law, dredged sediment requiring disposal is regulated as a solid waste, OAR 340-093-0030(82). Oregon adopted the federal hazardous waste identification rule, OAR 340-100-0002. Thus, if dredged material containing hazardous substances is managed and disposed under the requirements and protocols of the Clean Water Act, 33 U.S.C. Section 1251, et seq., such dredged materials are exempt from the definition of hazardous waste under Oregon's hazardous waste regulations.</p> <p>The Oregon Department of Environmental Quality (DEQ) evaluated the question of state solid waste regulations as applicable or relevant and appropriate requirements for the CDF. DEQ concluded that certain portions of the state solid waste regulations are relevant and the proposed removal action already incorporates many of them. In addition, DEQ concluded that certain portions of other relevant state solid waste regulations will be imposed on the Terminal 4 Removal Action during design and implementation, such as:</p> <ul style="list-style-type: none"> • Construction Certification • Operation Plan • Monitoring Discharge to the River • Closure Plan • Site Monitoring • Develop Financial Assurance <p>Therefore, since the potentially relevant and appropriate state solid waste regulations are not more stringent than federal law requirements, state solid waste regulations are not considered ARARs for the Terminal 4 CDF.</p>
Golder	2	<p>Issue 2: Seismic Design Earthquake</p> <p>The technical memorandum states that "This two level seismic design approach proposed by BBL is reasonable for seismic design of the CDF". Further the technical memorandum recommends "that the ground motions for the OLE event have a return period of 475 years and the ground motions for the CLE event have a return period of 2,475 years".</p>	<p>The EE/CA applied the 475 years CLE and 75 years OLE to the CDF design analysis. The U.S. Army Corps of Engineers (USACE) provides guidance for the design of confinement facilities for dredged material (USACE, 1987). USACE defines an Operating Basis Earthquake (OBE) as having "a 50-percent probability of exceedance during the service life." For non-critical structures, such as a CDF, the MDE (Maximum Design Earthquake) shall be selected as a lesser earthquake than the MCE (Maximum Credible Earthquake) which provides economical designs meeting appropriate safety standards. A critical feature is one "whose failure during or immediately following an earthquake could result in loss of life" (USACE, 1995). Failure of the CDF would not result in loss of life, and therefore would not be considered a critical feature. The selection of 75- and 475-year return periods for the OLE and CLE, respectively, are appropriate.</p> <p>The CDF would be designed so that seismic-induced deformations would be limited to about 0.5m due to the OLE. For the CLE, the CDF would be designed to allow for larger deformations, but complete berm failure and release of contaminated sediments would not occur.</p> <p>References:</p>

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			<p>USACE. 1987. Confined Disposal of Dredged Material. EM 1110-2-5027. 30 September.</p> <p>USACE. 1995. Earthquake Design and Evaluation for Civil Works Projects. ER 1110-2-1806. 31 July.</p> <p>USACE. 2003. Slope Stability. EM 1110-2-1902. 31 October</p>
Golder	3	<p>Issue 3: Selection of Acceleration Time Histories</p> <p>The technical memorandum states that “BBL selected acceleration histories from both shallow earthquakes (2,475-year hazard) and subduction zone earthquake events (475-year hazard). We believe that the acceleration time histories chosen by BBL are inappropriate for comprehensive evaluation of the earthquake response at the site.”</p>	<p>According to the Golder report, the acceleration time histories are appropriate for the 475-year return period event. As stated above, USACE guidelines support the use of this return period. Thus, the acceleration time histories are conservative and suitable for a feasibility-level evaluation. During final design of the CDF, a more rigorous search for appropriate earthquake time histories will be completed, considering distances to source(s), recorder site conditions, magnitude, duration, and frequency content.</p>
Golder	4	<p>Issue 4: Site Response Analyses</p> <p>The technical memorandum states that “the use of 1D site response analyses for the dynamic stability of the two-dimensional CDF berm may not be appropriate.”</p>	<p>In general, a 1-D analysis can provide valuable insight as to whether or not liquefaction and/or seismic deformations could result in unacceptable performance of the CDF. The 1-D analysis completed for this project indicates that seismic stability is an issue that must be addressed. Consequently, 2-D seismic stability analyses will be completed as a part of final design of the CDF.</p> <p>Recent project example (Kettle River Tailings Dam Expansion) indicates that Washington Department of Ecology Dam Safety Office agrees with the use of ProShake for dams; tailings dam design is quite similar in its nature to the design of a CDF berm.</p>
Golder	5	<p>Issue 5: Liquefaction under and inside the CDF berm</p> <p>The technical memorandum states that “considerable uncertainties exist when back analyzing case histories. Most researchers agree that the residual strength of liquefied soils should be presented as a function of the overburden pressure (Ishihara, 1996). This approach will result in lower shear strengths at the surface of the liquefied solid and potentially higher strengths at depth. BBL calculated one average value for the entire liquefied zone. This approach may not be appropriate for the CDF berm stability evaluation”</p> <p>The technical memorandum further states that the “berm will be constructed hydraulically”, implying that these fills are particularly prone to liquefy.</p>	<p>The EECA used a feasibility evaluation level analysis to evaluate conservative soil strength parameters on select, expectedly critical cross-sections. During final design of the CDF more cross-sections of various construction scenarios with different fill configurations will be analyzed.</p> <p>The analyses performed by Golder include some very conservative assumptions. If these recommendations were implemented here, the resulting design would far exceed appropriate safety standards. Some of the conservative assumptions include:</p> <ul style="list-style-type: none"> • The Technical Memorandum presents the results of a seismic stability analyses performed considering 0.42g PGA (2,475 year return period seismic event) see Figure 2-4, which far exceeds USACE design guidance for CDFs. . • Golder suggests that residual strength of the soil should be considered a function of soil overburden, and assume $S_u/s'v = 0.08$. Other published data (Olson and Stark, 2003) suggest that this value could be 50% higher (i.e., $S_u/s'v = 0.12$). • The concept for the construction of the berm set forth in the EE/CA report is considerably more robust than assumed in the comment. Specifically, rock training terraces and a sand and gravel core would be used to create a stable structure. See appendix K of the EE/CA report for more specific information on proposed construction materials and methods. <p>Hydraulic placement i.e., slurring material into its final place is not intended. The design will establish specifications for the selection and placement of the berm material, it can be assumed at even this early stage of the project, that a relatively well-graded, sandy gravel material will be placed, using clamshell placement. CDFs in the Pacific Northwest are normally built by the use of select granular material placed within the confining training berms constructed from quarry spalls. See appendix K of the EE/CA Report.</p> <p>Reference: Olson and Stark. 2003. Yield Strength Ratio and Liquefaction Analysis of Slopes and Embankments.</p>

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			<p><i>Journal of Geotechnical and Geoenvironmental Engineering</i>. 129(8):727-737</p>
Golder	6	<p>Issue 6: Seismic Settlement of Soils</p> <p>The technical memorandum states “the liquefaction of the alluvial soils could result in significant settlement of the berm Liquefaction of the CDF berm ... will likely lead to the catastrophic failure of the berm”.</p>	<p>The technical memorandum does not define the term catastrophic failure and are interpreted based on results of analyses considering a 2,475-year return period earthquake – significantly above standard practice for design of CDFs.</p> <p>The analyses completed by BBL for the EE/CA and Golder’s comments all indicate that CDF berm is susceptible to seismic deformations. These deformations will be evaluated in accordance with the responses noted above and designs modified as appropriate in order to meet appropriate design guidelines. Preventative measures, such as increasing the height of the berm or in situ densification of foundation soils may be considered during design if they are warranted.</p> <p>The CDF Operation and Maintenance Plan, discussed in Section 9 of the EE/CA, will be developed to include measures to respond to large deformations of the berm.</p>
1	1	<p>I object to the burial of the contaminated soil in the Terminal 4 trench.</p>	<p>The confined disposal facility will be a highly-engineered disposal facility. The primary engineering objectives will be permanence and effective containment of the contaminants placed inside. EPA’s Action Memorandum has set out initial criteria regarding the nature of the sediments that may be disposed of in the CDF. Additional criteria will be developed. The primary purpose of all of the criteria is to ensure that the contaminants disposed of will stay confined. Because of the high level of community concern over the types of material that would be placed in a CDF, EPA will include a public input process when developing the final screening criteria for determining the type of sediment suitable for disposal within the CDF.</p> <p>The proposed removal action has undergone a rigorous evaluation against risk-based criteria, relative effectiveness (e.g., long-term effectiveness and permanence), implementability, RAOs, community considerations, and costs. A number of design issues have been evaluated in the EE/CA or will be required by EPA to be evaluated and implemented during the design to ensure the long-term integrity of the CDF. This includes: 1) earthquake issues, 2) flood events, 3) groundwater passing through the CDF, 4) short-term impacts such as placement of sediment and settling, and monitoring, closure plan, and post construction certification. Specific considerations can be found in the EE/CA or will be available once the design documents are complete.</p> <p>EPA has identified a number of benefits for the CDF:</p> <ul style="list-style-type: none"> ▪ The CDF provides an opportunity to isolate and consolidate contaminated dredged materials on-site. ▪ Dredged material placed in the CDF is contaminated with various substances that are known to be toxic to people and aquatic organisms that use the Willamette River, but none of it failed the tests applied to solid waste to determine if it is hazardous waste (i.e. are chemicals in the waste leachable) even though such tests are not applicable to such material if disposed in an aquatic environment. ▪ Placing dredged materials in a CDF will effectively and safely isolate the contaminants from exposure to people and aquatic organisms. ▪ Construction of the CDF with excess capacity may facilitate long-term remedial action by creating

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			<p>another disposal option for future consideration in Portland Harbor cleanup decisions. Establishing an in-water disposal site will reduce the overall impact and potential environmental and public safety implications associated with transport of materials to offsite disposal facilities.</p> <ul style="list-style-type: none"> ▪ Having one or more disposal options for the Portland Harbor Superfund site also helps control the cost of disposal because it creates a more competitive market for disposal. ▪ Constructing a CDF at Terminal 4 encourages the consolidation of the contaminated sediments into a limited number of locations and may reduce the area within the Willamette River where contaminated sediments would be contained in place.
1	2	<p>I would like to suggest a better alternative. The alternative is to sanitize the contamination. The proposal is as follows:</p> <p>1) Removal of heavy metals. The method is similar in use at the Kennecott Copper mine in Utah:</p> <ul style="list-style-type: none"> a) Soil is ground to face powder consistency b) Soil is placed in water vats that is aerated by micronized air bubbles c) Air bubbles remove the metals and float to the top. This froth can be scraped and further processed. <p>2) Contaminated water can be de-contaminated using appropriate bacteria.</p>	<p>The treatment process you describe is for heavy metal contamination and is not appropriate for the type of contaminants encountered in Terminal 4 sediments. EPA favors the use of appropriate treatment technology, but we did not find any that were suitable for Terminal 4. Several treatment technologies were evaluated, but ultimately screened from further consideration, including:</p> <ul style="list-style-type: none"> • Thermal treatment, • Extraction, • Chemical treatment (e.g., sanitization, recovery), • Biological/bioremediation, and • Immobilization. <p>These treatment technologies were screened out because of: the requirement for multiple treatment technologies to address different contamination types, the relatively long time required for treatment, and lack of interest in vendors based on the project's limited size (i.e., small volume), duration, and high costs. There is also the potential to create additional waste streams through treatment, which have to be mitigated. For more information, please refer to Section 5.3.3 in the EE/CA.</p>
2	1	<p>As I write this letter there is a major fire occurring at the Schnitzer Steel Products Company which is located on the east bank of the Willamette River in North Portland. Several hook and ladder trucks are pumping water onto a mass of wrecked automobiles. A rather large smoke plume, which is probably toxic, is rising and drifting over North Portland. I mention this because the Schnitzer plant is directly north of the proposed Terminal 4 – Slip 1.Toxic Dump site. As you might imagine, I am surprised that the EPA would seriously consider placing a toxic sediment dump in such an unsafe area.</p>	<p>Contaminated sediments disposed within the CDF are below the surface in an oxygen deficient environment where there is no potential for fires to affect the contents. Please see response to Golder comment 1 for why under federal and state solid and hazardous waste regulations, the CDF is not a hazardous waste disposal site. For other stability or safety concerns, such as earthquake and flooding, please see EPA responses to Golder Comments 1-6.</p>
2	2	<p>I reside almost directly across the Willamette River from Terminal 4 – Slip 1. I am very concerned that the use of the slip as a toxic sediment dump site will have serious ramifications for the several hundred people who permanently reside in my neighborhood.</p>	<p>Because many people in north Portland live in close proximity to the proposed CDF, EPA wants to make sure that your concerns about the long-term safety and integrity of this facility are adequately addressed. EPA intends to solicit additional public input during the design phase regarding the level of contaminated sediment that may be disposed of in the CDF. Furthermore, through EPA's community outreach efforts, we will communicate the type of construction mitigation measures that will be taken to reduce noise and other short-term impacts construction of the CDF may have on the local community.</p>
2	3	<p>[My concerns include:] Health risks from materials moved to the site</p>	<p>Under the proposed alternative, uncontrolled pollution that currently poses a risk to humans and other ecological receptors will be removed and placed into a well designed disposal facility which eliminates potential exposure to contaminants that are isolated. Please see response to Comment 1-1 for additional information on a CDF.</p>
2	4	<p>[My concerns include:] The lack of notification about this proposal to people residing across the river from the site</p>	<p>We are sorry that you did not feel adequately informed about this proposal. EPA used newspaper notices, meetings, and mailings to make sure the community was informed. Community outreach activities are described in more detail in the Action Memo and we are open to suggestions for improving the Community Involvement Plan for Portland Harbor. In addition to the EPA activities, the Port of Portland also conducted a large number of public outreach events. In July 2004, the Port initiated a public outreach program regarding the development of Removal Action alternatives in the attempt to strengthen stakeholder involvement and communication, and to integrate stakeholder input into planning and decision making</p>

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			activities. The Port met with community groups and hosted open houses to maximize the community's opportunity to obtain information about the project and provide the Port with feedback. In conjunction with participating in community meetings and events, Port staff met with Local and Regional elected officials and their staff to provide them with information and listen to their feedback. During the Terminal 4 Removal Action, EPA will continue with the public involvement process.
2	5	[My concerns include:] The increase in noise and light pollution which may occur during the construction and on-going management of the site	EPA believes it is very important to minimize potential impacts for the neighbors living closest to the site. During the construction and cleanup, short term impacts such as noise, vibrations, traffic will be identified in the Removal Action Work Plan, along with actions needed to be taken to minimize them. The short-term impact to the community from Alternative C is lower than the other alternatives evaluated because construction-related traffic and cleanup activities will be conducted on site at Terminal 4 where access is controlled. Potential community risks associated with exposure to operational hazards such as light, noise and air emissions will be mitigated as specified within the Removal Action Area-specific Health and Safety Plan (HASP). Short-term impacts to the environment will be minimized by adopting appropriate control mechanisms such as dust control. Long-term community impacts from ongoing management of the site are expected to be minimal since the site is located within the Port of Portland's Terminal 4 and is secured. Through EPA's community outreach efforts, EPA will communicate the construction mitigation measures that will be taken to reduce noise and other short-term impacts construction of the CDF may have on the local community.
2	6	[My concerns include:] The fact that the area is on or near an earthquake zone	EPA conducted a rigorous examination of flooding, earthquakes and other catastrophic events during the evaluation of removal action alternatives. The Pacific Northwest is in a seismically active region. As a result, for the CDF to be feasible, the stability assessment of the containment berm (i.e., a main component of the CDF) needed to demonstrate that no contaminated sediments would be released under the design-level loading (i.e., static and seismic) conditions and included: <ul style="list-style-type: none"> • Operating Level Event (OLE) – representing an earthquake with a 50 percent probability of exceedance in 50 years, and • Contingency Level Event (CLE) – representing an earthquake with a 10 percent probability of exceedance in 50 years. Based on these analyses, limited deformations may be possible during and after the OLE, but the berm would remain intact to prevent release of contaminated sediments. Minor repairs along the face of the berm may be required after an earthquake. Under a CLE, large deformations of the berm may occur due to liquefaction of underlying materials, however the release of contaminated sediments is unlikely because of the materials in the berm, the cap and the CDF fill, being largely similar in nature will deform in a relatively compatible manner, without developing a rupture through which contaminated sediments could escape. For additional detail, please see the responses to the Golder Comments .
2	7	[My concerns include:] The possibility of airborne pollutants blowing across the River into the residential area during and after construction. Currently our neighborhood routinely receives a dusting of pot-ash from the ships loading at the dock adjacent to Terminal 4.	The removal action design will include a provision that contaminated sediments must be wet when they are being transported and placed. This will significantly minimize the potential for airborne contaminants at any time. The CDF will be designed with a layer of clean fill to prevent potential escape of dust. Dust from the clean layer will also be minimized. Once completed, the CDF will be paved over for use by Port operations. Pot-ash dust is not involved in this removal action.
2	8	[My concerns include:] The strong possibility of flooding and subsequent erosion that could easily occur.	EPA considered flooding, earthquakes and other catastrophic events in the evaluation of Alternatives. Since Slip 1 of Terminal 4 is located within the mapped 100-year floodplain, this evaluation complied with the Executive Order for Floodplain Management and EPA and Federal Emergency Management Agency (FEMA) regulations. EPA found that during a 100-year flood event the proposed action would have no effect on the surface water elevation of the Willamette River. The rise in flood stage would be negligible and would meet Federal criteria; there are no increases to peak discharge downstream and no noticeable impacts on Willamette River flooding. The design of the proposed action will consider erosional and scouring events of the river both during flood events and under "typical" conditions.
2	9	[My concerns include:] The on-going potential for fire danger in this	See response to Comment 2-1 .

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		area.	
2	10	[My concerns include:] Will an evacuation plan for the residents of North Portland and the Linnton neighborhood situated across the river be in place as part of the creation of the dump site?	No actions have been proposed that would require an evacuation plan for the residents of Linnton, St. Johns or Cathedral Park. The proposed action will reduce the risks posed to neighbors from the uncontrolled contamination presently in the river.
2	11	[My concerns include:] I wonder what potential Toyota customers might think if they learned that their new automobile had been parked next to a toxic dump site on its way to the dealership? It certainly would make me think twice about purchasing a Toyota!	The proposed Alternative reduces or eliminates exposure to contaminated sediments and will not affect vehicle offloading at Terminal 4.
2	12	The proposal, as described in the June 8, 2005 Oregonian article, does little to ameliorate any of my concerns. I cannot understand the logic of using the river as a toxic waste dump. If the Willamette River is appropriate as a toxic waste site, why is the city of Portland spending millions of dollars to curtail the flow of sewage into the river? I am in opposition to this foolhardy plan. It seems to me that the only factors under review are cost and expediency.	Multiple environmental problems face the Willamette River. The city effort to prevent raw sewage from being discharged into the river is a separate but important effort to address overall water quality and eliminate ongoing discharges of pollutants into the river. The Superfund cleanup efforts will address unpermitted sources of hazardous substances into the river as well as cleanup contamination in the river from past releases.
2	13	It doesn't really appear that safety and common sense are entering into the planning. Putting a permanent toxic dump site in the heart of a Superfund Clean-Up area would be comical if it wasn't such a dangerous thing to do.	Please see the response to Comment 1-1 . EPA would not consider a cleanup proposal valid if it posed new or additional danger to people or the environment.
3	1	In my estimation the idea of dumping 700,000 cubic yards of material contaminated with pesticides, chemicals and heavy metals (which could include mercury) alongside a fast flowing river which has flooded the area several times in the past and holding it there with an earthen berm is just another example of this administration's idiotic notion of saving money at the expense of very possible environment hazards and a possible contamination of the ecological system all the way from Portland's Terminal 4 to the sea and then some.	Please see the response to Comments 1-1 and 2-8 . EPA will include a public input process when developing the final screening criteria to ensure your concerns are addressed. The cost of cleanup at Terminal 4 is the responsibility of the Port of Portland, not the taxpayer funded Superfund. While the Port is primarily funded privately, it does receive about 5% or less of its' operating budget from a local tax base.
3	2	[Commenter describes site that cannot be used by the public for fishing, boating or swimming due to it's concentration of these heavy metals] Why do you want to present our area with the prospect of such a problem now in or in the future? This seems like another of the Bush Administration's boondoggles. Thanks but no thanks. I think you should give this considerably more thought.	Please see the response to Comment 1-1 . The proposed action will reduce the concentrations of contaminants currently located in the river.
3	3	It will cost the area millions if not billions if this turns out to be a mistake and will ruin not only the downstream Willamette but also the lower reaches of the Columbia river. I think this is an obvious farce.	EPA evaluated the cleanup alternative and determined that the CDF can be designed to be safe and effective in containing the contaminated sediments from Terminal 4.
3	4	[This proposal will] give us tainted Salmon, Sturgeon and Smelt for just a few.	Please see the response to Comment 1-1 . The proposed alternative will reduce the concentrations of contaminants currently located in the river, thus reducing potential exposure and toxicity to fish.
4	1	We are residents of the Linnton Neighborhood across the river from Terminal 4. Our family is opposed to redesigning T4 to store toxic waste.	Please see the response to Comment 1-1 .
4	2	This is a dangerous proposition in our opinion and is being pursued by the City of Portland because it is the cheapest option.	This action has been proposed to EPA by the Port of Portland. Please see the response to Comment 1-1 . The cost information presented by the Port does not indicate the CDF is significantly less expensive if no other waste is placed in the CDF or if a large portion of any additional waste comes from other Port cleanup projects.
4	3	Heavy rain, natural catastrophes, and poor management of the site could result in contamination escaping into our river.	Please see the responses to Comments 2-6 and 2-8 . A long-term management plan will be required from the Port as a part of this cleanup. EPA plans to oversee the long-term monitoring and management of the CDF after it is constructed.
4	4	We ask you to require this material to be hauled inland to a safe	Your preference for off-site disposal has been noted. Please see the responses to Comment 1-1 .

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		location.	
5	1	We live on the River. WE KNOW the problem.	Thank you for your input.
5	2	We are currently appalled that pollution is not only not being addressed but is being added to. Nobody knows for sure that contaminants will not escape landfills or other holding storage. Slip 1 could well be the next disaster area.	<p>It should be noted that the proposed alternative will REDUCE the concentrations of contaminants currently located in the river. In evaluating the long-term effectiveness of the Removal Action, the Port and USEPA have identified a number of post-removal site controls that will be implemented. These include periodic monitoring, sampling and analyses to evaluate the progress of the monitored natural recovery (MNR) and to verify the long-term adequacy of the performance of the sediments caps. In addition, post removal action confirmation sampling and analysis will be conducted after construction to provide direct measurement of residual concentrations. Corrective actions will be taken if caps or dredged areas fail to meet performance requirements. All of these are being required by EPA to ensure that releases from the CDF do not occur.</p> <p>Capping contaminated sediments and on-site confined disposal facilities are proven methods that have been successfully used in the Northwest to eliminate exposure to contamination. In the Commencement Bay Superfund site, three CDFs have been sited, designed and constructed under the regulatory oversight of EPA.</p>
5	3	Please examine the motives of those who promote burying contaminants in the River. Is it possible that they look forward to ongoing cleaning-up enterprise? I have become extremely suspicious. This is a sad and alarming state of affairs.	<p>The contaminants are not being buried in the river; rather they will be placed in an engineered confined disposal facility to isolate the material from exposure to aquatic organisms or humans. Please see the response to Comment 1-1.</p> <p>The cost of the proposed removal action is not significantly different from the other alternatives. EPA believes that construction of a CDF with extra capacity can provide an overall net benefit to the Portland Harbor Superfund site by providing on-site disposal that may isolate and consolidate contaminated dredged materials. Creating disposal options for the Portland Harbor Superfund site helps control the cost of disposal because it creates a more competitive market for disposal. This in turn, makes dredging and removal of contaminated sediment a more cost effective remedy and encourages the consolidation of the contaminated sediments into a limited number of locations and may reduce the area within the Willamette River where contaminated sediments would be contained in place.</p>
6	1	Our club is very concerned with the location of the proposed hazardous waste site at Slip 1, Terminal 4	Please see response to Comment 1-1 and 2-3 .
6	2	[Our club is very concerned with the] lack of information as far as mitigation for loss of warm water spawning habitat, water area and how the area will be handled in regard to warm water fish presence.	<p>The Biological Assessment (BA) in Appendix P of the EE/CA focused on Federally listed and proposed threatened and endangered species in accordance with requirements of the Endangered Species Act (ESA). However, other aquatic species were evaluated in terms of the sustained presence of natural habitat-forming processes in the watershed that are necessary for long-term survival of the species.</p> <p>It should be noted that the Preferred Alternative will benefit fish and wildlife in the Lower Willamette River by isolating contaminated sediments that presently pose a risk to aquatic organisms. Although the Removal Action area is highly developed for maritime commercial uses, some wildlife, including threatened and endangered fish species, other native and non-native fish species, amphibians, and other wildlife use the site to varying degrees.</p> <p>Using the <i>Matrix of Pathways and Indicators</i> (MPI), as developed by the NOAA Fisheries, six conceptual groups (e.g., water quality, habitat access, habitat elements etc.) and 18 habitat indicators (e.g., temperature, sediment, chemical contamination etc) were employed to assess the Preferred Alternative environmental effects on these other species, including warm water spawning habitats. Effects of the proposed action are classified as to whether the action will restore, maintain or degrade a particular indicator. Based on the analysis, it was identified that environmental baseline conditions are not functioning properly within the Removal Action area and that the proposed Removal Action will not degrade long-term conditions. However, it was concluded that habitat (including that of warm water species) will be destroyed through creation of the CDF for which mitigation will need to take place.</p>

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			EPA plans to mitigate habitat lost through creation of the CDF. The Preferred Alternative would result in loss of 15.3 acres of aquatic habitat in Slip 1. Temporal loss would occur when approximately 8.7 acres of cap are placed and 9.2 acres are dredged. Details of the Compensatory Mitigation Measures process can be found in Appendix Q, Section 7.2 of the EE/CA. Additionally, the Action Memorandum provided initial performance standards for required mitigation. A final mitigation plan will be developed as a requirement of the design process.
6	3	We are currently requesting information from both the Port of Portland and ODFW. We would appreciate a 30 day extension on public comment and perhaps changing the public meeting now scheduled for the 23 rd of June to the 30 th . Our club represents over 300 warm water anglers, most in the Portland-Metro area and our scheduled meeting is the 23 rd . This would allow us additional time to get answers from both the Port (who seems to be in a big hurry) and ODFW. Your assistance would be greatly appreciated and the people of Portland should have every opportunity to comment on this proposal.	Due to several requests for extension, EPA extended the comment period from 30 days to 90 days.
6	4	It has also been brought to our attention that Waste Management-NW is going to establish a site for waste management on the River adjacent to Cathedral Park and will move waste by train to Arlington. This might well be an unexplored option which would eliminate the need to place toxic waste at the Slip 1 site.	Upland disposal of dredged material was explored as an alternative in the EE/CA as Alternative D and is considered a viable alternative. However, based on a number of evaluation criteria, including factors such as less handling and transport of contaminated material and less community impacts from truck transport (which would be used regardless of disposal location), the CDF option was selected as the preferred alternative. EPA has identified a number of benefits for the CDF for the Terminal 4 cleanup and potential benefits for the harbor-wide cleanup. Please see the response to Comment 1-1 .
7	1	The proposal to move the mess and re-burry the material close by seems to be a non solution. Please make it a permanent solution not a cost savings measure.	Please see the response to Comment 1-1 .
7	2	If you run out of money contact the people who benefited from creating the mess and make them pay.	Thank you for your input. The Port of Portland has taken responsibility for all cleanup costs for the Terminal 4 project. Under the Superfund laws, viable Potentially Responsible Parties pay the cost of cleanup, including EPA oversight costs.
8	1	Any cleanup of the toxic wastes along the 6 miles of Portland's superfund site needs to include removing the toxic materials from the river and from its shores.	EPA has noted your preference for removal of sediments. Under the proposed alternative, a significant amount of uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Lower level contamination will be capped in place. Due to the wide-spread area and depth of contaminants in the river, it is not possible to remove all of the contamination. Therefore, one of the objectives of cleanup is to minimize or eliminate any potential exposure to contaminants by aquatic organisms or humans. Also see response to Comment 1-1 .
8	2	So long as these wastes are left in this watery environment, we cannot feel safe from their migration to other locations. Please make this cleanup a true cleanup. The waste needs to be moved to a far safer location, or processed into a safe form.	Please see response to Comment 1-1 .
9	1	As a father of 3 and a local pediatrician I am very interested in a clean river! The coast is generally too cold or Hwy 26 too crowded to get to the coast on pretty days. Many local families especially with small children rely on the river beaches for sand play and beach fun. Check out sauvie island on a 75 degree or warmer day and look at the numbers of families going.	EPA agrees that actions are required to protect human health and the environment. As such, Alternative C was selected as it was identified as the most aggressive and acceptable in eliminating risk pathways.
9	2	Small children and pregnant moms are eating fish caught in the river. Please do everything possible to clean the river.	EPA agrees that protecting the health of pregnant women and young children is a very high priority and our actions must be sufficient to protect them as well as general human health and the environment. The cleanup of Terminal 4 is one early action being taken in Portland Harbor to reduce risks to people and fish and wildlife that use the river. The proposed Removal Action will reduce the concentrations of contaminants

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			currently in the river which pose potential toxicity and bioaccumulation concerns to fish and the people who consume them.
10	1	I support a clean-up of the toxic waste currently in and being dumped in the Willamette River in Portland, OR, [I support] and properly storing it in a landfill and not in the river.	Please see response to Comment 1-1 and Comment 12-1 .
11	1	We TRUST THIS FINDS YOU OPEN TO APPLY ALL THE AUTHORITY INVESTED IN YOUR PERSON TO MAKE EVERY WISE EFFORT TO SEE THAT THE PORTLAND HARBOR IS CLEANED UP AND MADE SAFE FOR THE CITIZENS IN THIS AREA. WE THANK YOU FOR TAKING FULL ACTION IN THIS IMPORTANT ENVIRONMENTAL ACTTIME IS OF THE ESSENCE. WE ARE PREPARED TO COME ALONG SIDE AND HELP WHERE NEEDED.	The cleanup of Terminal 4 is not being delayed and the response will be protective of human health and the environment.
12	1	It is beyond time for real action cleaning up the Willamette River. Get the waste out now.	Thank you for your comment. EPA agrees that action must be taken to clean up contaminated Willamette River sediments. The Terminal 4 cleanup is an early action being undertaken prior to deciding the harbor-wide cleanup plan so that risks can be reduced sooner. However, time must be spent developing cleanup plans so they are technically and scientifically sound, comply with laws and regulations and the public is provided the opportunity to participate in the process. Another important objective for early cleanups like Terminal 4 is that they facilitate the larger Portland Harbor cleanup. EPA believes the selected Terminal 4 cleanup meets this objective.
13	1	I agree with Oregon Center for Environmental Health that the Portland Harbor cleanup should be as complete as possible. The toxic wastes should be removed to a toxic waste disposal site, not left in the river.	EPA has noted your preference for off-site disposal of sediments. Please also see response to Comment 1-1 .
14	1	The six mile stretch of the Portland Harbor has a history of over 100 years of industrial waste disposal practices. Now is the time to solve this problem!	EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done.
14	2	PLEASE GET THE TOXICS OUT OF THE HARBOR AND INTO A PROPERLY PERMITTED LANDFILL WHERE THEY BELONG!	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .
15	1	Protection Agency my ass.	Comment noted.
15	2	When you leave hazardous sediments in the water you are not protecting anyone. Don't just move it around. Remove it!	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .
16	1	I am in support of the harbor cleanup.	Please see the response to Comment 12-1 .
16	2	While this may be the least expensive alternative for the Port, it certainly is not the best choice for the community now or for future generations.	The cost information presented in the EECA does not indicate that the CDF is significantly less expensive if no other waste is placed in the CDF or if a large portion of any additional waste comes from other Port cleanup projects.
16	3	There are simply too many possible catastrophic scenarios to make this under water storage acceptable.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see responses to Golder comments and Comments 2-6 and 2-8 .
16	4	The toxic wastes shouldn't be allowed into the river to begin with, but, to agree to this inadequate attempt of resolution would be a dereliction of duty.	Thank you for your input. Please see the response to Comment 1-1 .
16	5	[I am in] in total disagreement regarding the Port's plan to "store" these contaminates under water. Please continue to press for these cleanups and the proper disposal of any toxic material from our rivers! Storing toxic material in the river is NOT an acceptable plan.	EPA has noted your preference for off-site disposal. Please see the response to Comment 1-1 .
17	1	We are writing to express my concern for the plan to store toxic waste in the terminal slip at Port of Portland in the Willamette River. Further delaying REAL cleanup of the Willamette River is not a solution.	Please see the response to Comment 12-1 .

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17	3	As concerned citizens we ask that the EPA to totally remove toxic substances from our waters and dispose of them in a permanent manner. Do this for the betterment of our existing community and generations to come.	EPA has noted your preference for off-site disposal. Please see the response to Comment 1-1 .
18	1	I am writing to add my voice to the many concerned Portland citizens who are calling on the EPA to permanently dispose of the toxins the Portland Harbor Superfund site. A temporary storage in another part of the river is not acceptable. Please clean up our river for good!	Please see the response to Comment 1-1 .
19	1	I strongly oppose any temporary, Band-Aid measure to address the Superfund site at the Portland Harbor and Willamette River. This issue has been carrying on for far too long. This letter requests a safe cleanup strategy that permanently removes the toxins from the harbor and river.	Please see the response to Comment 12-1 . Each of the alternatives analyzed in the EE/CA offer a viable permanent cleanup option for contaminated sediments. However, when the studies on the entire Portland Harbor site is completed, the Port may need to do more work if it is determined to be needed.
19	2	[t]he liable parties need to be held accountable to addressing this toxic situation.	Thank you for your input. The Port of Portland has taken responsibility for all cleanup costs for the Terminal 4 project. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs.
20	1	In today's Oregonian, I was pleased to read that the EPA was going to require NW Natural to finally clean up the tar body. I would hope that your record of expediting Superfund sites would prevail here. Please take the momentum created by the cleanup of the tar body, and get our Willamette River back to the asset that drew the first people to come to Oregon.	Thank you for your comment. The cleanup at GASCO is not part of this current proposal, and has already been completed.
20	2	Then there was a full page ad about a Thursday hearing on the overall treatment of Superfund wastes in the harbor. The recommendation to disturb and remove the variety of hazardous materials, then place them in another water containment area still in the harbor was unbelievable. In this proposal there are multiple risks: probable leakage during removal; need for multiple ways to store the variety of toxins and placing them in basically the river again to eventually leach and leak. If they are to be removed, then just remove them to a permanent, nonriver waste center.	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .
21	1	I have had difficulty getting information about the Portland Harbor Superfund site from the EPA website. However, what I understand is that the cleanup of the Portland Harbor is currently being considered by the EPA.	EPA checked our website in response to your comment to make sure that documents were easily accessible.
21	2	I am concerned that toxins will not be fully removed from the water, but will simply be covered up or stored in an abandoned terminal slip. This is unacceptable. We need to fully remove toxins now and contain them in a manner that future generations will not have to deal with. My neighbors and I will be watching this issue closely.	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .
21	3	Please develop a plan that gets rid of hazardous and cancer causing agents in our waterways.	EPA agrees that actions are required to protect human health and the environment. Please see the response to Comment 2-3 .
22	1	GET THE WASTE OUT OF THE RIVER	Please see the response to Comment 12-1 .
23	1	I am a Portland resident. Please pursue the safest cleanup strategy possible for the Portland Harbor.	EPA agrees that actions are required to protect human health and the environment. Please see the response to Comment 2-3 .
23	2	Seriously consider removing toxic substances from the harbor bottom and dispose of them permanently where they will not threaten people and wildlife.	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .

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23	3	Long run benefits make this short term sacrifice worthwhile. If this is not within your budget, please make it known more tax money is needed for this important objective.	The Port of Portland, who is the potentially responsible party for the Terminal 4 cleanup is bearing the cost of the cleanup. It does not involve an expenditure of the taxpayer funded Superfund. While the Port is primarily funded privately, it does receive about 5% or less of its' operating budget from a local tax base. Please see response to Comment 4-2 .
24	1	It is extremely important that the toxic substances are removed from the river bottom and stored in a permanent properly permitted landfill. Please do it right.	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .
25	1	To the Oregon Center for Environmental Health Dear Sirs, After reading your ad in the Oregonian, I wish to state my support for removing the hazardous material from what should be a beautiful river and a Safer river too. Permanently—for a Clean river. Hope you get a Big response like mine.	The proposed cleanup will be done by the Port under EPA oversight. Each of the alternatives analyzed in the EE/CA offer a viable permanent cleanup option for contaminated sediments. Please see the responses to Comment 12-1 and Comment 19-1 .
26	1	Please don't keep the waste IN the Columbia!! Please dispose of it in a safe permanent containment area, away from the river!!	The Terminal 4 Cleanup does not address contaminated sediment in the Columbia River, but it will contribute to cleaning up the Willamette River. EPA has noted your preference for offsite disposal. Please see response to Comment 12-1 .
27	1	I want to acknowledge the EPA for the commendable work you have done and are doing for the environment.	Thank you for your input.
27	2	I understand the intent but urge you to use the precautionary principle for the Terminal 4 cleanup and support the landfill option over filling in slip #1.	Please see response to Comments 1-1 and 12-1 .
27	3	As a resident of Linnton and the Environmental Chair of the Linnton Neighborhood Association, I was initially hopeful when I heard that there would be early action to clean up the Willamette River. This was followed by shock to find out that the preferred "action" by the Port of Portland and the EPA is to build a toxic dump in the river and only 400 yards from our Historic Town of Linnton.	Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comment 2-2 .
27	4	Far from being an "isolated area", we are a town with a proud history predating that of Portland. Indeed, we were a thriving town before the highway was widened in the 50's, obliterating half our businesses. Now we are a neighborhood of several hundred homes and more than a dozen businesses that look directly at the slip you plan to transform into a 15 acre toxic dump. My own doorstep is approximately 550 yards from the site in question. The Linnton Neighborhood Association has several serious concerns with this plan.	Please see response to Comment 2-2 and 12-1 .
27	5	It destroys any hopes we have for a vibrant waterfront in Linnton. The Portland Bureau of Planning, as a result of a recommendation by River Renaissance, convened a planning group a year ago, consisting of neighbors, businesses, industry, and other stakeholders (including the Port of Portland) in order to consider the design of a mixed-use village in Linnton. Having a toxic dump 400 yards away will essentially dash any hopes of any investor wanting to participate in the development of our town. In addition, no parents would want their children to play in the proposed park or on the beach just hundreds of yards from this toxic dump. This is personal. Would you want this toxic waste dump 400 yards from your home?	Action is being taken at Terminal 4 because there are uncontrolled hazardous substances posing risks to people and the environment. It is incorrect to equate a CDF to a toxic waste dump. Please see the response to Comment 1-1 and Comment 2-3 .
27	6	A 15 acre toxic dump adjacent to the river makes no sense environmentally. It is well known that even landfills on dry land will leach eventually, even if state of the art lining materials are used.	Suitability criteria will be developed with public participation for the contaminated sediment selected for placement in the CDF. Please see the response to Comments 1-1 and 12-1 .

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		Why in the world would we want one in the river?	
27	7	This site is a flood zone and there are three earthquake faults in this area. What precedent are we setting in a city known for its environmental leadership?	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of alternatives. Please see response to Comments 2-6 and 2-8 .
27	8	It makes no sense economically. Any savings of burying the waste in the river will be more than offset by the economic disaster to the values of our homes and businesses of having a toxic waste dump 400 yards from our riverfront.	All alternatives analyzed in the EE/CA benefit the community by reducing the risk of exposure to contaminated sediment. The Removal Action will include burying the wastes in the river, but rather will be placing contaminated sediment within a carefully designed CDF. Also see responses to Comment 1-1 and Comment 2-3 .
27	9	During our [Linnton] planning process, we were told repeatedly that this whole stretch of the river is "industrial sanctuary". This was used as an argument against developing our village. Why does it now make sense to take a 15 acre slip out of commission when our opponents have seen our 40 acre site as precious industrial land and have therefore opposed our dream of a village by the river?	Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations.
27	10	The EPA and the Port of Portland have been champions in the field of Sustainability. EPA grants have funded amazing projects. The Port of Portland has done wonderful work, i.e., eliminating toxic chemicals and composting food waste at the airport.	Thank you for your input.
27	11	Creating a toxic dump in the Willamette River and calling it "cleaning up the river" will be seen by both friend and foe as a cynical move driven by money.	Cost was not a significant factor between the alternatives. Also see response to Comment 5-3 . All of the alternatives carried forward for evaluation (Alternatives A, B, C, and D) are protective of human health and the environment. Please see response to Comment 1-1 .
27	12	Please do not destroy our hope of a truly clean Willamette River – for all generations to come, by claiming that a toxic dump built in a slip is the best solution for our beautiful river, for our town, and for our kids. Many Linnton residents once played on our Linnton beach, swam in the Willamette River, and played in the Linnton Park when they were children. None of this has been possible for many years. We in Linnton dream that once again there will be children swimming in a pristine Willamette River, and playing on Linnton's unique and beautiful sandy beach and picnicking in a park that is safe, clean and accessible.	The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. Please see response to Comments 1-1 and 2-3 .
27	13	Please lead the way by cleaning up the river the right way, by disposing of this waste inland. Our grandchildren and great-grandchildren and all future generations of all species deserve nothing less.	Please see response to Comments 1-1 and 12-1 .
28	1	Willamette Riverkeeper has reviewed the major portions of the EECA for T4 and offers the following comments. We have multiple questions about the cleanup of Slip 3, and the creation of a Confined Disposal Facility (CDF) at Slip 1. While we have questions and concerns, we do believe that there is the potential for this action to lead to a better overall cleanup of contaminated sediments from throughout the Portland Harbor area of the Willamette River.	Thank you for your input. The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River.
28	2	Some have expressed concerns about the long-term impact of a CDF in regard to ecological and human health. While some questions need to be answered, it seems to us there will be multiple opportunities for community members to have input on the design and implementation of any such facility, if approved. It seems that there is an opportunity to address issues related to a CDF's long-term relationship to the Willamette River's ecology, and human health.	EPA agrees that actions are required to protect human health and the environment and encouraged public comment and input for this project. As a result of public comments, some additional design considerations will be required by EPA. These are outlined in the Action Memo and include geotechnical considerations, monitored natural recovery contingencies, sediment disposal criteria (which will have a separate public input process), and compensatory mitigation.

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28	3	As with any large and complicated project, we believe that community involvement is critical. We believe that this kind of participation should be continued into the design of any future CDF, and into the Waste Acceptance Criteria that must be developed that will determine the level of contaminated sediment that will be allowed into the facility.	EPA agrees that community involvement is essential to making good decisions and we will continue to seek and encourage public involvement. In response to community concerns, EPA will solicit public input when developing the screening criteria to ensure your concerns are addressed.
28	4	In researching active CDF sites, we have learned that they can indeed work. We've learned from the folks at Citizen's for a Healthy Bay, in Tacoma, a group that works on Commencement Bay, that these sites have worked for them with contaminated sediment that is very similar to what we know resides in Portland Harbor. Further, Citizen's for a Healthy Bay have monitored their sites for years. For example, at their Milwaukee Waterway site, after 13 years of monitoring, there has been absolutely no change at the site whatsoever. They have three such sites in Commencement Bay.	Commencement Bay is an example of where a CDF has proven successful in the Pacific Northwest. A CDF must be engineered for the specifics of the site, such as for fresh water as opposed to salt water, and long term monitoring must be a part of the plan.
28	5	For Portland Harbor we must ask the question, "what will lead to the best, cleanest, and most comprehensive cleanup of the Willamette River in this area?" It would seem if we provide a nearby, scientifically sound, ecologically sound option for "some" types of contaminated sediment, that we will enable more PRPs to do the right thing – and get their dirty sediment out of the Willamette River.	The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. EPA agrees that actions are required to protect human health and the environment. As noted within Comment 2-3 , the proposed action, Alternative C, will reduce exposure of humans and ecological receptors to site contaminants. In addition, the CDF has excess capacity for disposal of an additional 560,000 cubic yards of contaminated sediment from other cleanups in the harbor if it is decided that the material is suitable. Also see response to Comment 12-1 .
28	6	If we fail to do this, we may well have a harbor that has dozens of Capped sites. Instead of monitoring one main facility, in the case of a CDF, we may be relegated to monitoring dozens of sites in a dynamic river environment. With dozens of sites, there would be an equal number of PRPs responsible for monitoring their individual sites. This does little to quell worries about long-term risk.	Consolidating sediments in a CDF could reduce the number of capped sites requiring monitoring. An on-site CDF should encourage the Port of Portland to take more early actions to remove more contaminated sediments from the river. The proposed Removal Action for this Early Action will provide a reduction in risks from contaminated sediment at Terminal 4 and may provide options for disposal of dredged materials from the larger cleanup of the Portland Harbor. Please see response to Comment 1-1 .
28	7	If we limit the cleanup of sites to dredging and landfill disposal, such as Arlington, we may well end up with companies fighting the cost of such cleanup, with the river remaining in a polluted state for decades after, and a slough of litigation occurring.	EPA agrees that actions are required to protect human health and the environment and are committed to pursue the path set forth in the Non-Time Critical Removal Action (NTCRA).
28	8	Willamette Riverkeeper has worked on this project for years, and have been the leading vocal advocate for getting the river cleanup up in a timely and comprehensive manner. We need to ensure that human and ecological health is addressed in this cleanup. If our concerns about the CDFs engineering and waste disposal criteria are addressed, we may well have another viable option that will lead us to cleaning up the Willamette River for the betterment of river wildlife, and people.	As a result of public comments, some additional design considerations will be required by EPA. These are outlined in the Action Memorandum and include geotechnical considerations, monitored natural recovery contingencies, sediment disposal criteria (which will have a separate public input process), and compensatory mitigation. Please see the response to Comment 1-1 .
28	9	While the document is clearly laid out, and follows the general guidance for an EECA, there are some claims that are made that don't seem to be clearly substantiated or sufficiently discussed.	Thank you for your input. The analysis conducted was similar or exceeded that of similar EE/CAs, and was consistent with the Non-Time Critical Removal Action (NTCRA) guidance document. For specific responses to comments, please see responses below.
28	10	The first Removal Action Objective listed on page 2 of the Executive Summary is to "reduce ecological and human health risks associated with sediment contamination with the Removal Action area to acceptable levels." Analytical data were compared only to PECs and TECs which are screening values used for ecological risk.	The TECs/PECs were the only concentration-based benchmarks that were available that matched the scale of potential exposure at the site. These values are typically used to evaluate the potential toxicity of sediments where no data on biological effects are available (e.g., toxicity test results or community characterization).
28	11	<i>Note: this comment merged with 28-10 above.</i>	
28	12	Sediment samples were divided into surface sediments (0 – 1 foot) and subsurface sediments (> 1 ft). The biologically active zone for	The 0-1 foot depth interval was identified in the EE/CA Work Plan (Section 7.8.2), which was approved by EPA. This depth interval is consistent with the depth interval used to represent surface sediments in the

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		benthic organisms is generally considered to be 0 – 0.5 ft. However, all samples were screened against the benthic PEC/TEC criteria (or they appear to have been)	Harbor-wide RI/FS. The Port and EPA team agreed to be consistent with Harbor-wide investigations where appropriate. Justification for the depth interval in the Harbor-wide RI/FS was based on (1) Sediment Profile Imaging results which showed sediment organisms deeper than 6 inches below mudline and (2) based on bathymetry results, over 90% of sediments in the 0-1 foot depth interval were stable over 2 years.
28	13	No screening criteria were used for human health receptors although they were identified in the conceptual site model development. We continue to talk about human health, and yet we don't have a baseline and cannot demonstrate what it is going to be. We are using criteria for ecological risk, yet not for human health	Exceedance of existing risk-based criteria for either ecological or human receptors, although not site-specific, can be enough to justify a removal action. Terminal 4 is within the scope of the Portland Harbor RI/FS which will include a comprehensive human health risk assessment due to direct and indirect (i.e., food web) exposures. The Harbor-wide RI/FS will result in risk-based sediment cleanup criteria based on the baseline risk assessments. To ensure the Terminal 4 cleanup is protective of human health and the environment, Terminal 4 will be reviewed and compared to the harbor-wide risk assessments and final cleanup criteria. Sediments in the portions of the Removal Action Area that are dredged, and those that are designated for Monitored Natural Recovery (MNR) will be monitored to determine whether conditions are consistent with cleanup criteria developed from the Harbor-wide process. If not, then additional action may be required.
28	14	No estimate of current risk, residual risk or risk reduction is presented in the document for either ecological or human health receptors although claims are made that "the goal of the Terminal EE/CA Report was to develop conceptual designs for removal actions that reduce risk, and provide a comparative evaluation of the alternatives." This implies that there is some baseline risk or hazard measurement or index.	No baseline risk assessment is necessary to determine that risk is reduced significantly by the proposed removal action. Capping and the CDF reduce risk by blocking exposure to bed sediments and concentrations of contaminants in the dredged areas are substantially reduced. Baseline human health and ecological risk assessments were not completed for the EE/CA because these studies are being conducted as part of the Harbor-wide RI/FS and will yield risk-based cleanup goals that can be applied to the Terminal 4 site to determine whether residual risk is acceptable.
28	15	While estimated volumes of dredged material are presented in the document, we were unable to find clear information on proposed dredging depths and the rationale used for those decisions	Preliminary dredge prisms were developed for the purpose of estimating the cost and feasibility of alternatives in the EE/CA. See Appendix E of the EE/CA for details. Dredge depths were selected based on one half of the PEC (probable effects concentration) and positive results of toxicity tests performed for the Slip 3 RI/FS. In some cases, areas that do not exceed PECs are included in dredge or capped areas due to engineering constraints.
28	16	Page 2-3. A soil unit consisting of dark grey, loose to medium dense soil...encountered below the fill in upland explorations and below surficial sediments in in-water explorations was described as a combination of fairly low density and small fines which make the saturated portions of the sand potentially prone to liquefaction during strong seismic shaking. If surface sediments are being dredged, and this type of soil unit is uncovered, how does this affect the stability of the CDF and especially the berm? I did not see this issue addressed anywhere in the report.	The issue of the liquefaction potential of soft, saturated sediments is addressed in Appendix K of the EE/CA, which presents the stability assessment of the proposed CDF berm for various loading scenarios.
28	17	Page 2-4 Section 2.2.5. While the RAOs specifically delineate protection of human and ecological receptors, it appears that PECs and TECs are the only screening criteria being used. How will protection of human health be addressed? How will you know if you met that goal?	Please see response to Comments 28-14 and 28-15 above.
28	18	Page 2-4 Section 2.2.5. Generally speaking, PECs have been used on a number of DEQ sites. Where there are exceedances of screening level criteria, most of them appear to exceed only the most conservative TEC values. If the LWRG does not develop criteria for sediment before this removal action takes place, what clean-up numbers will you use, how will they be developed, who will review and approve them, and what will you use to ensure that human health is protected	The Removal Action Alternatives were developed based on the nature and extent of contamination, guided primarily by exceedance of PECs and positive results of toxicity tests performed for the Slip 3 State-lead RI/FS. In some cases, areas that do not exceed PECs are included in dredge or capped areas due to engineering constraints. Identification of cleanup goals is one of the main objectives of the Harbor-wide RI/FS. These goals will be available for assessing the dredged and MNR areas in the Removal Action Area.
28	19	Page 4-1 Section 4.2.1. This section states that human health risks will be reduced through the reduction of contact between receptors	Please see response to Comments 28-14 , 28-15 and 28-18 .

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		and COPCs. And that this reduction will reduce local health risks to acceptable levels. What are the levels now, how far are they from acceptable, how much will they be reduced and on what basis is the claim made that it will be acceptable. Looking at the data in Appendix H, there are some areas where higher concentrations, exceeding both PECs and TECs are found only at depth and not in surficial soils, or even soils as deep as 3 – 5 feet.	
28	20	Section 7. The Chemical Characteristics subsections of Section 7 describe the contaminated sediments in each of the areas to be remediated. It appears that only the ecological screening values of PECs and TECs are being used and that although there are samples that exceed the very conservative TECs, exceedances of the PECs is limited to only some sections. For instance it appears that in Berth 401, Slip 1 and Wheeler Bay concentrations of contaminants in sediments are between the TEC and the PEC values.	Please see response to Comment 28-18 .
28	21	Page 8-1. The subcriteria listed includes protection of human health. What is the risk to human health, how much will it be reduced?	Please see response to Comment 28-14 .
28	22	Section 8. It is unclear in review this section, how volumes were estimated, the depths for dredging and the criteria for developing the proposed depths.	See response to Comment 28-15 .
28	23	Appendix E. It appears that the only screening criteria used are for PECs and TECs. Although the biologically active sediment unit is considered to be 0 – 6 ft, these screening criteria are used at depth. There are few exceedances, mostly of PAHs and metals of both the PECs and TECs. There appears to be no evaluation of the screening criteria, its appropriateness, and any subsequent use of the information within the document.	The screening criteria are used at depth to assess the potential risk from sediments that may be uncovered during dredging. This information was used to help determine the depth of dredging needed, especially in Slip 3. Please also see response to Comment 28-18 .
28	24	Appendix M, Page M-2. "The condition of the ecological habitat in the Removal Area has not been formally assessed." How then will the effectiveness of any removal action be assessed? A baseline should be established.	The reference to "baseline ecological condition" refers to a formal characterization of ecological habitat, not specifically ecological risk. The potential risk analysis was conducted using the conservative assumption that habitat throughout the in-water areas is potentially habitable by aquatic organisms. This conservative approach is consistent with EPA guidance for NTCRAs and direction from the EPA/DEQ risk assessment team.
28	25	Appendix M Page M-4. Although human receptors are identified in the conceptual site model, I do not see where potential risks to these receptors are qualitatively or quantitatively addressed, except to say that risks will be "significantly reduced".	Please see response to Comments 28-14 and 28-15 .
28	26	The section on CDF recontamination is blank. Why is this?	The recontamination analysis is a work in progress which will not be completed until just prior to the initiation of cleanup. The recontamination analysis will include data collected during the Spring 2005 to obtain wet weather sediment trap and stormwater data. Because of unusually dry conditions during the 2004 field season, data representative of wet conditions were not available. An additional round of field activities was performed in Spring 2005 to obtain data representative of wet weather conditions. The recontamination analysis is a way for the Port to assess the post-removal action conditions to help ensure that the Port will only have to clean up the removal action area once. The AOC allows the Port to conduct this recontamination analysis at the time of the EE/CA, again during design, and finally prior to implementation of the remedy.
28	27	What is the likelihood that the overall Portland Harbor Cleanup will result in increased use of Sediment Caps if there is not a nearby facility that can receive some contaminated sediment? Does it not	EPA believes that construction of the CDF, while addressing the human health and environmental concerns of sediments within Terminal 4, also has the added benefit of creating an additional option for disposal of sediments from the harbor-wide cleanup that would not otherwise exist. Please see the

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		stand to reason that without a nearby facility, we will end up with a greater degree of capping utilized at the dozens of areas being cleaned up over the next few years?	response to Comment 1-1 and Comment 28-6 .
28	28	Is it true that most sites with caps covering a contaminated site result in a significant amount of monitoring over a long period?	Long-term monitoring is required when hazardous substances are confined in place, including capped areas. Long-term monitoring will also be required for the CDF and the MNR areas proposed for the Removal Action Area. Appendix L of the EE/CA describes potential Removal Action monitoring and the Action Memorandum also adds additional performance standards for the MNR areas. Please see the response to Comment 28-6 .
28	29	Does it stand to reason that a nearby site that can aid a Superfund Cleanup will aid in getting more PRPs to the table when the Record of Decision is finalized?	The decision to construct a CDF at Terminal 4 is based on protecting human health and the environmental at the site, but there may be a potential added incentive to promote dredging in other areas of the Harbor, since the CDF has excess capacity for dredged materials. The effect of getting more PRPs involved is not certain, is not guaranteed by EPA, and is not the primary factor in selecting the preferred alternative.
28	30	What are the known failure rates of CDFs of a similar size and likely contaminant concentration to the proposed Slip 1 CDF?	In EPA's review of available information, we did not find any reported failures or difficulties from CDF. However, careful engineering, construction and monitoring are needed to ensure a CDF will function properly.
28	31	What are issues of concern that have developed at individual CDF sites across the United States?	EPA's evaluation of potential CDF use included review of technical, scientific and engineering knowledge, regulatory matters as well as the past experience on public comments gathered on previously completed CDF projects. The evaluation of the CDF reflects the current practice of CDF design and construction. CDFs are likely to be affected by local conditions and should be designed on a site-specific basis. Also see responses to Comments 2-3 , 2-6 , and 2-8 .
28	32	Are these being used in the Northwest, and what difficulties have been encountered?	CDFs and other in-water confined disposal facilities have been successfully used at the Commencement Bay Superfund site. Based on available information, all CDFs in the Pacific Northwest function as intended.
28	33	Could a CDF that could accept certain levels of contaminated sediment increase the rate of cleanup in Portland Harbor?	An on-site disposal facility will increase the options for consideration by sediment site managers as they develop clean up alternatives for other locations within the Portland Harbor Superfund Site. See response to Comment 1-1 .
28	34	What sources of clean fill will be utilized to construct the berm?	The identification and selection of appropriate borrow material sources will be completed during the design and construction of the CDF. In general terms, material sources providing clean, inert, granular fill materials will be considered. These may come from a variety of sources, but could include material from other Port properties or materials supplied by commercial vendors.
28	35	<p>Willamette Riverkeeper also believes that the Port of Portland, for the privilege of utilizing this site for a CDF, and gaining the use of lands that belong to the Department of State Lands, should:</p> <ol style="list-style-type: none"> 1) Provide a riparian restoration project at the CDF site, and 2) Provide a significant restoration site in the lower 10 miles of the Willamette River, or other nearby waterways within the Portland Metro area. <p>We believe that the proposed restoration projects will help ensure that the CDF not only helps clean up the Portland Harbor, but that the Port of Portland will also continue its tradition of value-added restoration work that is beneficial to the people of the Portland area and beyond. Such projects should complement, but not take the place of, any obligations the Port of Portland has under the Natural Resource Damages aspect of the Portland Harbor project.</p>	<p>EPA requires the Port to develop a mitigation plan in compliance with the Clean Water Act Section 404(b)(1). The analysis is presented in Appendix Q, which analyzes potential requirements of the 404(b)(1) process and includes a plan and schedule for developing a mitigation plan during the design phases of the Removal Action. Mitigation projects required by this removal action are needed to mitigate for unavoidable impacts resulting from the Terminal 4 action and will not be compensation for damages to natural resources caused by the release of hazardous substances from the Terminal 4 facility. The Natural Resource Trustees, including state, federal, and Tribal Governments, are assessing damages to natural resources from releases to the river and will negotiate appropriate settlements for such damages in the future. See the Action Memorandum, Section 6, for more detailed mitigation performance requirements outlined by EPA. Significant requirements are summarized below:</p> <p>Compensatory mitigation plans will be developed pursuant to performance criteria and in consultation with EPA and resource agencies, and be submitted to and approved by EPA during the Removal Action Design. General criteria EPA required to address Lower Willamette River watershed issues include:</p> <ol style="list-style-type: none"> 1) All compensatory mitigation must be consistent to the maximum extent practicable with any established mitigation strategies or conservation initiatives supported by state and federal resource agencies for the Lower Willamette River basin. 2) Preference will be given to compensatory mitigation plans that are consistent with habitat function.

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			<p>3) All compensatory mitigation plans will include an assessment of how they contribute toward the conservation and recovery of ESA listed species.</p> <p>4) Mitigation plans must include consideration for connectivity to existing habitat.</p> <p>5) The potential success of the mitigation projects will be specifically factored into habitat plans.</p> <p>6) All compensatory mitigation plans will include measurable performance objectives, management, monitoring and reporting requirements, responsibilities, and schedules.</p> <p>7) Native species only will be utilized in any plantings to the maximum extent practicable.</p> <p>8) Mitigation plans should include facility design and site plans for any development/redevelopment that occurs as a result of a fill. The facility and site plans must ensure that the facility and site characteristics and functions do not create adverse impacts to water, sediment, and habitat quality during construction and operation.</p>
29	1	I downloaded the PH T4SOW092503.pdf but found it an awful lot to swallow. I am not a scientist but I am very much for cleaning up our Willamette River.	Thank you for your input.
29	2	While our current society appears to be so wrapped up in attaining/maintaining affluence, taking care of our Willamette will actually veer us off that path and hopefully have us all involved in creating a healthy river and a legacy.	Thank you for your input. Please see the response to Comment 12-1 .
29	3	While no cleanup is even close to cheap or painless I feel we should keep in mind that it is not today's cost that should steer our thinking but the idea of a clean river that flows into the Columbia and then to the ocean for all. The thought of more recreation, pride and respect for what flows through our city.	One of the primary evaluation factors is the effectiveness of the removal action to reduce risks to human health and the environment. The implementability and cost of the removal action are also factors for consideration, but cost cannot outweigh the requirement to protect the environment.
29	4	We are not as ignorant as we were in the past. We need to respect what we have and care for it. Please help us clean up our river the right way and make us proud.	EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done.
30	1	I am trying to follow and understand the analyses and options, but I still don't understand why getting the toxic material out of the river and stored in as best a landfill as we might have is not the way you are pushing for.	Please see response to Comment 1-1 . Additionally, off-site transport of large volumes of dredged material also has impacts on the environment and the community as were discussed in the EECA.
30	2	Why would it be good to store in the river?	The dredged sediment will not be stored in the river, but rather placed in a carefully designed disposal facility at Terminal 4. Please see response to Comment 1-1 .
30	3	Wouldn't that [a CDF] be harder to monitor over the years to come?	Long-term monitoring will be a condition of design and required by EPA. Monitoring a CDF, while different than monitoring upland disposal sites, has the same set of objectives and challenges than upland disposal. Also see response to Comment 28-6 .
31	1	I am writing to express my opposition to any plan to store recovered toxic waste anywhere it can be reached by one of the Willamette's recurring floods. Thank you.	EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see the response to Comment 1-1 and Comment 2-8 .
32	1	I am writing to let you know of my concern for the welfare of the Willamette River. I want the EPA to get the toxics out of the harbor and into a properly permitted landfill where it belongs!	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .
33	1	I want you to know that the EPA must get the toxics out of the harbor and into a properly permitted landfill where it belongs. The future health of our beautiful river must be maintained.	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .
34	1	After reading a recent article in the Portland "Oregonian" about plans for disposal of toxic waste materials at Terminal Four in the Portland harbor, I am stunned and angry. I am appalled at the plan to create a dump site in slip Number One right next to the river. Historically, these supposedly "safe" sites have proven to be otherwise.	Please see response to Comment 1-1 and Comment 2-3 .

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34	2	It is obvious that the Port and the EPA are looking for a convenient hole to deposit not only toxic waste from Terminal Four, but also contaminated materials from outside the terminal.	Construction of the CDF will effectively confine contaminated sediment from Terminal 4. The excess capacity may facilitate cleanup of Portland Harbor, but whether additional dredged sediment may be placed in the CDF will need to be made future cleanup decisions.
34	3	This plan may be viewed as a cost saving plan, but a plan should be adopted that is the safest over the long range	EPA's evaluation of the preferred alternative has determined that the CDF can be designed to be safe and effective in the long-term.
34	4	I am requesting that you develop a better plan which will remove the toxic waste AWAY from the river.	Your preference for off-site disposal of sediment was noted. EPA analyzed five alternatives that cover the range of options available to protect people and wildlife from contamination. Please see the response to Comment 1-1 .
35	1	We support cleanup of toxic materials from the Portland, Oregon, Harbor.	Thank you for your input. Please see the response to Comment 12-1 .
35	2	[We] do not agree that the toxic waste should merely be relocated to a terminal slip at the Port of Portland. We feel that these dangerous materials should be completely removed from the river and put into a secure landfill. We urge you to support this alternative.	EPA has noted your preference for off-site disposal of sediments. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
36	1	I am writing to ask the EPA to move start the cleanup of the harbor at Portland, Oregon. We need to remove hazardous sediments from part of the Portland Harbor including pesticides, mercury, PCB's and dioxins.	EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done. Please see the response to Comment 2-3 .
36	2	We must not store them in-water in an abandoned terminal slip at the Port of Portland.	EPA has noted your preference for off-site disposal. Please see the response to Comment 1-1 .
36	3	It is unfortunate that so many toxins were discharged into our river. At this time, we need a real cleanup that safely removes the toxins so that they can't leak	Please see the response to Comment 2-3 .
36	4	[we need a real cleanup that safely removes the toxins so that they can't] be disturbed or dislodged by a severe flood. We already know that a flood plain is not a suitable site for storage of toxic materials of any kind.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see the response to Comments 2-6 and 2-8 .
36	5	It is important to work toward the safest cleanup strategy possible. Please remove this toxic waste and dispose of it permanently elsewhere in a properly permitted landfill where it belongs. Thank you.	EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
37	1	I can't believe that things are allowed to get this out of hand. Getting to the point where the solution is compromised by finances mean that someone messed up earlier.	Thank you for your input. The preferred alternative was determined to be the most protective and cost was not a significant factor between alternatives.
37	2	Whoever is responsible for the contamination should be held accountable, otherwise it will be the tax payers and future generations who will pay the price.	Thank you for your input. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is responsible for paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs.
37	3	Concentrating contamination near a hugely powerful and dynamic system like the Willamette River, not far from an earthquake fault, is just asking for problems later.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that rigorous examination of flooding, earthquakes and other catastrophic event was part of the evaluation of Alternatives. Please see response to Comments 2-6 and 2-8 .
37	4	Let's really use the Precautionary Principle rather than just giving it lip service while we really concern ourselves with money. Moving the contamination from the river bottom to the bottom of the slip at Terminal 4 right next to the river is an irresponsible way of sweeping it under the rug for someone else to deal with at a later time. It will cost even more money to deal with later. Let's do it right.	EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see the response to Comment 1-1 and 2-3 .
38	1	As a concerned citizen and resident of the Portland metropolitan area, I oppose the Port of Portland proposal to clean up the waste at	Only contaminated sediment with relatively low level concentrations or non-leachable contaminants will be allowed in the CDF. EPA intends to seek additional public input on the final sediment quality criteria for the

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		Terminal 4 because it creates a hazardous waste disposal site in the very river that everyone wants to clean up.	CDF during the design phase of the project. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
38	2	I do support dredging these contaminated sediments and shipping them by rail to an appropriate land fill in eastern Oregon. I believe getting toxic material out of the river is the safest, long-term cleanup strategy instead of simply burying it in the river. I urge you to please consider the wisdom of a long-term cleanup strategy for future Oregonians.	EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
39	1	I couldn't believe it when I saw the information in the Oregonian Wednesday, June 22 nd regarding the Portland Harbor clean up plan. Moving toxic substances from the harbor, and then storing them in an abandoned terminal slip at the Port of Portland is not a healthy alternative. These toxins need to be removed from the water completely and disposed of in a permanent location other than the river.	EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
39	2	Please don't go about this clean up in a half hearted manner. Use the funds given to do the job properly.	The EE/CA provided a very thorough analysis of the problem and potential alternatives. EPA believes the selected decision is the best use of resources to get the cleanup done, protect human health and the environment, and provide additional options for the Harbor-wide cleanup.
40	1	I believe that the waste from this clean up project should be removed from the river and shipped to an appropriate hazardous waste facility.	EPA has noted your preference for off-site disposal. The dredged sediment to be placed in the CDF is not hazardous waste. Although it poses risks to human health and the aquatic life, so that it needs to be removed and isolated, the concentrations do not rise to the level of qualifying it as hazardous waste. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
40	2	There are too many uncertainties regarding long term "storage" of this waste including Flooding, Earthquakes and the long term responsibility of monitoring this site. Let's clean up the river but do it in a permanent way.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. In addition, long-term monitoring will be required by EPA to ensure integrity of the CDF and protection of human health and environment. Please see response to Comments 2-3, 2-6 and 2-8 .
41	1	Reopen and adopt the previous interagency agreement with the Ross Island Sand and Gravel Company, whereby they would be allowed to extract gravel to a depth of 100 feet from their island pit free of charge. Then turn the pit over to the Port of Portland for the deposit and burial of contaminated dredge spoils from the Harbor. When the island is filled and properly sealed, it will be turned over to public ownership. To the best of my recollection the parties involved were the Oregon Department of Environmental Quality, the Oregon Division of State Lands, the Environmental Protection Agency, the US Army Corps of Engineers, the Port of Portland, and Ross Island Sand and Gravel Company. Somewhere in your files, you will have records of this agreement. Since I am retired, I do not have access to the exact time.	Thank you for your input. EPA did not evaluate Ross Island as a disposal alternative.
42	1	Concerning the Portland Harbor T-4 cleanup site, it seems to be a common sense silly idea to move hazardous waste from one spot in the river to another! Capping and lining the toxic waste in a submerged water environment is not good enough.	EPA has noted your preference for off-site disposal. However, both Slip 3 and Slip 1 require cleanup. Moving dredged sediment from Slip 3 to Slip 1 is not a significant distance. In fact, the likelihood that hydraulic dredging can be used due to the short distance to the CDF is an environmental plus because there are fewer impacts from dredging hydraulically. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
42	2	Engineering studies often, time do not translate into reality. Leaks do	Oversight and long-term monitoring are always an integral part of cleanup actions to ensure the

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		occur, it's still in the same location, and it's near local ground water supplies.	engineering and design are functioning as intended.
42	3	It won't help the area's economics by living or building new development near or on a toxic waste dump.	Cleaning up uncontrolled contaminated sediment will likely provide economic benefits for the Harbor as well as reducing the risk of direct exposure to contamination. Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations.
42	4	If your going to spend any funds at all to clean it up, then do it right and build a permanent storage site in a safe and more acceptable location. Eastern Oregon sites, such as locations like Portland's garbage dump site near Umatilla come to mind where it's drier and less ground water conflict potential. Please get the waste out of the river, moving it around is not acceptable.	EPA has noted your preference for off-site disposal. The dredged sediment from Terminal 4 is relatively low level concentrations and what is allowed to be placed in the CDF will not be highly leachable or transportable by groundwater. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
43	1	I am writing in opposition to a proposed plan to create a toxic dump in Port of Portland's slip 1, Terminal 4, across from Linnton, OR. I urge you to oppose this proposal, and to do all that you can to avert this project.	EPA has noted your opposition to this project. Please see response to Comment 1-1 .
43	2	I am a registered voter and taxpayer in the City of Portland, Oregon, and am highly opposed to this dump. We are spending millions of tax dollars to clean up the river, to make it more environmentally friendly for salmon and other desired river creatures, as well as for our families and future generations. This proposed dump threatens to undermine our efforts.	Thank you for your input. Please see the response to Comment 1-1 and Comment 23-3 . The Terminal 4 action will require a significant amount of mitigation, and the EE/CA and Action Memorandum describes both the process and initial performance standards that the mitigation will need to meet. Salmon habitat and restoration will be one of the primary objectives of the created or enhanced mitigation projects. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife.
43	3	While this proposed site will be "protected" from the river by an earthen berm, such a berm can allow slow but steady seepage of the toxic wastes into the river. A monitoring well is proposed to monitor seepage, but I don't see how this will prevent the problem.	Please see response to Comment 5-2 .
43	4	Furthermore, inadvertent human error can upset the best of plans. A previous attempt by the Port to bury contaminants in the river near Ross Island failed; subsequent cleanup was very costly. And then of course, there are 'acts of God,' such as flooding and earthquakes, which could upset the plan and allow the contaminants to enter the river.	The Ross Island project was not an engineered CDF and is unrelated to this project. The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see response to Comments 2-6 and 2-8 .
43	5	I love our river and the views and activities it supports. I love to swim in the river. I love to eat salmon who swim up the river to spawn. I love watching children enjoy the river's sandy beaches along Sauvie Island. Please help keep our river clean and safe from all these activities.	EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done. The selected alternative is protective of human health and the environment.
44	1	I am writing to express my concerns about proposed plans for storing toxic waste in Portland. The Port of Portland wants to dredge contaminated sediments at Terminal Four and place them in a prepared, in-water disposal site at the adjacent Slip 1. The Port is also proposing that they accept an additional 600,000 cubic yards of sediment from the larger harbor clean up. Given that the slip is located on a fault line and that the proposed dam will be earthen, the logic of such a proposal seems to be, pardon the expression, on shaky ground.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic event are adequately addressed. Please see response to Comments 2-6 and 2-8 .
44	2	Further more, Portland is a growing city. The industries that have traditionally existed along the Port, near down town Portland are	Placing selected materials in a CDF does not create a new Superfund site. It takes uncontrolled contamination and places it in a secure and manageable environment at the same facility. The initial study

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		rapidly being displaced by urban housing. The industries complain of a lack of heavy industrial land. Putting a toxic waste dump in an area, where the surrounding land will certainly need to be taken out of development seems rather short cited. The industries will need a place to be displaced to. Urban growth is inevitable. Placing the toxic waste dump in that industrial area will prevent the natural evolution of the city.	area identified for the Portland Harbor Superfund Site extends from River Mile 2.5 to River 9. The surrounding land will not need to be taken out of use as a Port facility. In fact, 17 acres will be created by the CDF for the Port to use consistent with its charter and City zoning. Please see the response to Comment 1-1 and Comment 42-3 .
44	3	The Port's motivation, that they can generate income from hosting a toxic waste dump seems like the worst motivation of all. This kind of thinking seems to be on the edge of ethical behavior.	The ability of the selected cleanup option to generate income for the Port of Portland was not a factor used in evaluating alternatives.
44	4	Increasing a neighborhoods likelihood of exposure to toxic waste for profit is not a way that we, as humans, can afford to think anymore. And please don't forget, many people live very close to that area.	Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 and 2-3 .
44	5	Toxic waste isn't called toxic waste because it is harmless. Please don't let the desire for profit prevent Portland from doing the right thing.	Toxic waste is, in general, a broad term that does not convey the specific circumstances and limitations that may make it toxic. Waste that is "toxic" from a direct exposure or bioaccumulation standpoint (for fish and/or human health), is not the same as waste that exhibits high leachability that cannot be safely contained. Any waste placed in a CDF would have to meet carefully established leachability criteria that will be developed with public input.
44	6	I support dredging these contaminated sediments and shipping them in specially prepared rail cars to an appropriate land fill in eastern Oregon.	Please see response to Comment 1-1 .
45		I support dredging these contaminated sediments and shipping them in specially prepared rail cars to an appropriate land fill in eastern Oregon.	Please see response to Comment 1-1 .
46	1	We realize that it might cost less " the Band -Aid approach, but does it address the issue or only delay it?. Our river's quality are paramount to our lives, and to the fish and wildlife that live and drink from it.	The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. Cost was not the driving factor for selection of the preferred alternative. Please see response to Comment 1-1 and 2-3 .
46	2	I ask you, the agencies spokesperson request the removal of all pesticides, mercury, PCB's and dioxins from the Willamette river. These hazardous sediments need to be stored in a properly permitted landfill where they cannot contaminate the river.	Please see response to Comment 1-1 .
47	1	I am writing you concerning the extremely upsetting issue of the EPA creating a toxic dump in slip 1, terminal 4 of the Willamette river, directly across from the Linnton neighborhood. We have lived in Linnton for five years and love the area. I am confident that every resident of our neighborhood would share the same feelings of extreme concerns and worry regarding this issue. I trust you will be sympathetic to the real concerns of everyone that lives in the area and seriously consider other alternatives to 'cleaning up the water front.' I appreciate your time.	Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comments 2-3 and 5-2 .
48	1	Sean, I am aware of the proposed dump at Terminal 4, Slip 1, which I am personally and professionally opposed to for a number of reasons, not only the ones listed in this e-mail.	Thank you for your input. It is incorrect to characterize the proposed CDF as a toxic waste dump. See responses below.
48	2	..as each year goes along the issues of continuing to be located in Portland, Oregon become more and more difficult. This is only one that the Port of Portland has done to the local community.	Thank you for your input.
48	3	..the Port of Portland proposal does not allow for the replacement of	Please see response to Comment 6-2 .

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		warm water fish spawning grounds as well as the salmon, steelhead, and sturgeon that make the area temporary home.	
48	4	Again, a toxic waste dump does not belong on the river!	EPA has noted your opposition to the project. Please see response to Comment 1-1 .
48	5	The only reason in which the Port of Portland wants the dump placed at Terminal 4 is to save the Port several million dollars in proper deposal fees. The Port of Portland does not care for the river, fish, and potential health problems to the public which use the river for water skiing and swimming.	Thank you for your input. The preferred alternative was determined to be the most protective and cost was not a significant factor between alternatives. Please see response to Comment 1-1 and Comment 7-2 .
49	1	I am concerned about the Port of Portland's plan, Terminal 4 Early Action Sediments Cleanup, to dispose of toxic waste by burying it immediately adjacent to the Willamette River, then capping it with concrete. Burial of this material in an active port with the potential for industrial accidents, in an active seismic area, and by a river with a history of flooding seems to be a very short-sighted solution that has the potential of exposing the citizens of Oregon and Washington to toxic waste for generations to come.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see the response to Comment 1-1 , Comments 2-6 and 2-8 (earthquake and flooding) and 2-1 (fire).
49	2	Please do not approve this plan.	Thank you for your input. EPA considered all alternatives presented in the EE/CA and has selected Alternative C as the preferred alternative. Please see other Responses as to the issues considered by EPA in making this decision. Of particular interest may be responses to Comments 1-1 and 2-3 .
50	1	I oppose the plan to put toxic materials in the slip near Linnton.	Thank you for your input. It is incorrect to characterize the proposed CDF as a toxic waste dump. Please see the response to Comment 1-1 .
50	2	Put effort into finding \$\$\$ to ship it to Arlington or somewhere else.	EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see the response to Comment 1-1 .
51	1	I would like to register my strong objection to your planned dumping of toxic waste into the Portland Harbor.	Thank you for your input. It is incorrect to characterize the proposed CDF as a toxic waste dump. Please see the response to Comment 1-1 .
51	2	Your planned use of Slip #1 as a toxic dumpsite is delaying the inevitability of toxic material leaching back into the main water system and into the ground water. I call to your attention the last Portland scheme to do essentially the same thing—the dumping of toxic waste in the gravel pit in the Willamette River across from Johns Landing, and covering it up with clay and rocks so that the River would not wash it back downstream into Portland Harbor. Millions of dollars were wasted in this venture.	The Ross Island project was not an engineered CDF and is unrelated to this project. The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of alternatives. Please see the response to Comments 2-6 and 2-8 . In addition, please see the response to Comment 5-2 for leaching concerns.
51	3	Bite the bullet and ship the waste to a toxic dump site in Eastern Oregon, and save us from injecting 1.2 million gallons of polycarbonate into the soil in hopes that this will neutralize the toxins present and not cause a far more expensive future cleanup problem.	EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
52	1	I am writing to voice my opinion of being opposed to the above "Clean up the River" proposal wherein a toxic dump will be created across from the town of Linnton, Oregon, even though an earthen berm will be a divider between the dump and the river.	Thank you for your input. It is incorrect to characterize the proposed CDF as a toxic waste dump. Please see response to Comment 1-1 .
52	2	I am a resident living close to this area and I most definitely don't want anything of this sort near my home where my family plays. I assume you would not want it for your family either.	Thank you for your input. Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comment 2-2 .
52	2	Any toxic waste removed from the river and surrounding areas should be trucked to an isolated inland location and buried very deeply.	EPA has noted your preference for off-site disposal. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
52	3	Please reevaluate this plan and create a different solution for the	Please see response to Comment 4-4 .

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		issues.	
53	1	As a resident of the town of Linnton, Oregon, across the river from the Port of Portland Terminal 4, I want to express my opposition to the plan to use Slip 1 as a Confined Disposal Facility (CDF) for toxic waste. This location is a mere 400 yards from the front door of our town. Adding toxic waste to the location is unacceptable.	Thank you for your input. Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comment 2-2 .
53	3	I recommend the application be denied.	Thank you for your input.
54		NOTE that #54 was same as #28, Willamette Riverkeepers letter and this row is intentionally left blank.	
55	1	The Port of Portland is in the business of saving money. That's why we're all here today. You know, decades ago, they were the ones that polluted it. I helped. I'm one of the polluters. I put it in the river, at the direction of the Port, to expedite shipping in the cargo industry. And what I saw tonight is we're doing the same thing. We're putting costs first. And all we're doing, and it was mentioned here, we're going to -- this might be a site for all potential parties, responsible parties. All they're doing is making one, big superloaded zone that can repollute the river again.	Thank you for your input. Please see response to Comments 2-3 and 5-2 .
55	2	I tried to get a technical question answered about where the test monitoring wells will be. Against the river. But anybody that works out at Terminal 4, works in a soda ash storage building, which is underground. Ground water is moving in all different directions. The only way you're going to be sure nothing's moving is complete monitoring around this site, completely, at different levels. Because computer models are one thing; Mother Nature is another thing.	It should be noted that there is an extensive monitoring well network on the upland portions of the Terminal 4 property for source control monitoring. This includes areas near and upland of Slip 1, where the CDF would be constructed. Past monitoring of these wells has allowed the Port to obtain an understanding of groundwater movement and direction. In addition, although specific locations for monitoring wells adjacent to the river and the CDF have not yet been determined, they are required should the CDF be constructed. The monitoring well network will be developed such that groundwater between the CDF and the river will be monitored and potential discharge of contaminants into the river, if any, will be detected. Corrective actions will be taken if the CDF fails to meet performance criteria.
55	3	We wouldn't be in this situation if we watched what Mother Nature did. But, no, we put costs first.	The preferred alternative was determined to be the most protective. Cost was not a significant factor between alternatives.
55	4	I have a lot of questions, but the main concern is, right now, we're doing this on the cheap. That's what we're doing. It's been a practice of the Port to do a lot of things -- it spends a lot on public relations, but this is their responsibility.	Please see response to Comment 7-2 .
55	5	And the best way, the way that -- you wouldn't have to worry in the future about mitigation if it wasn't there, if it was removed. We have to accept the responsibility of what we did out there, and by removing it, that's the best step to making it a safe river again.	Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is dredged from the river placed into a well designed disposal facility that will protect people and wildlife. Please see response to Comment 1-1 .
55	6	Oh, I have one other thing. Just to put the Port -- in the Port's perspective. This is the Port's 20/20 vision plan about running the rail track over the slip. It's been there for five or six years. This is just an easy solution for them to keep building the Port bigger.	Thank you for your input. We were informed that the CDF was consistent with potential future development of the Port. Consistency with anticipated future land use is a factor that EPA considers in making cleanup decisions.
55	7	Except, what happens after this facility is built and we do our monitoring, and we discover our great computer model for the environment isn't working, and it's leaching back into the river?	Cleanup decisions routinely use engineering and modeling as decision-making tools and monitoring and oversight are important to make sure a facility functions as it was designed to do. Please see the response to Comment 5-2 .
56	1	I am strongly opposed to the Port's plan to store the hazardous waste, and I think it should be classed as that at this facility near the river.	Thank you for your input. Please see response to Comment 1-1 .
56	2	I'm very impressed by everything the engineers for the Port have said, the PR people have said, I'm very impressed, but when I see the reality of what happens --	Thank you for your input. The bank restoration at Terminal 4 is unrelated to this project and EPA's decision. However, the Terminal 4 removal action will require long-term monitoring and reporting by the Port and EPA oversight. Please see the response to Comment 1-1 .

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		<p>For instance, I'll give you an example, there was a restoration of banks near this area, Slip 3 or Terminal 4, a very small area, and this was explained to us at the CAG what would happen. It was also very impressive, as it was tonight. However, about a year after this was accomplished, my husband and a small group of people went out to look at the actual restoration, and we found coal tar right on the facility. This is a carcinogen, and is a very surprising thing after listening to a very complicated presentation. What this says to me is that there's questions of ability, and accountability, and credibility that the Port has to answer for, and I really don't think that they should be storing this waste on the river with this plan that looks very good as a computer model on paper, but, on execution, probably won't be as good as this, and there will be many problems that will add to the expense as well as the risk to the river.</p> <p>So I'm strongly opposed to storing it. I think we ought to use the precautionary measure that is not risk-based. It identifies hazards, and I think we ought not to take the risk.</p>	
56	3	I think we ought to truck this stuff to Arlington, I think it should be considered a hazardous substance, and away from the river, away from things we can't predict, like earthquakes, and floods, and what will happen.	Your preference for off-site disposal has been noted. Please see response to Comment 1-1 and Comments 2-6 and 2-8 regarding earthquake and flood issues.
56	4	The engineering may be good on paper, but I just don't think that the physical -- the physical things that happen along the way that we can't predict will result in a good result for all of us.	Thank you for your input. Please see response to comment 42-2 .
57	1	I want to thank the EPA for giving me an opportunity to be here tonight and to speak to all of you. Most importantly, I want to thank the community who came out tonight. It's so important. This is a done deal unless we stand up to this and say no. Do you know that? It's a done deal. So that's why we put a full-page ad in the newspaper on it, to try to encourage the community to get involved and let people know what the hell is happening in your river. We have an opportunity, Neighbors and Friends, to make this happen. But we have to do it by coming to these hearings, by calling our elected officials. This is a federal decision. We should be calling our federal legislators, we need to be calling, we need to be writing, and we need to make this river clean and healthy for us and for our children.	Thank you for your input. EPA agrees that community involvement is essential to making good decisions and we will continue to seek and encourage public involvement. In response to community concerns, EPA will include a public input process when developing the screening criteria to ensure your concerns are addressed.
57	2	The Port of Portland has not been a very good steward of their front yard. In fact, I would say they fouled their nest.	Thank you for your input. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs.
57	3	Now we have a chance to do the right thing, and the right thing is to dredge this stuff out of here and send it by barge or by rail, it's very easy to do that, just rail it down there, and get it to Arlington in an appropriately designed landfill	EPA notes your preference for off-site disposal. Please see response to Comment 1-1 .
57	4	You know, Mike Struthers (phonetic) said we should just get this stuff dredged, and we have some kind of a start-off Dr. Seuss machine we could put it in, and it would come out inert, and we can put on playgrounds. But the fact is, that's probably not going to happen, and the best we can do with the mess that we've got to deal with is if we can get it into a landfill out of the river.	Thank you for your input. Please see response to Comment 4-4 regarding technologies and alternatives evaluated.

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57	5	Putting it into a CDF is a make-shift option. It's going to leak. It's going to require monitoring.	EPA believes that the Terminal 4 cleanup and construction of the CDF is a long term permanent solution and also contributes to the cleanup of the overall Portland Harbor site. Please see response to Comments 2-3 and 5-2 .
57	6	We've got PCBs in here that have been around from 35 years ago. They are still in the river like they were the day they went into the river. They're going to be here for hundreds of years, and all we're doing is leaving this legacy for our kids because at some point this thing is going to have to be dealt with.	Thank you for your input. The preferred alternative will permanently remove the contaminated sediments in the river and place them in a engineered disposal facility that will minimize or eliminate potential exposure to contaminants.
57	7	It's going to leak, it's going to liquefy in an earthquake, it's going to flood, it's not an appropriate way to clean up our river. So our organization is going to argue for landfilling.	Please see response to Comments 2-6 and 2-8 regarding earthquake and flood issues and 5-2 for leaching issues. Please see response to Comment 1-1 regarding landfill disposal.
58	1	The sustainability is often defined as having three components, the environmental, the economic, and the social, and I believe the social has been given short shrift in deciding to put in this plan.	<p>Thank you for your input. EPA took into account community impacts when developing alternatives for the Terminal 4 Removal Action and Alternative C represents very low short- and long-term risk and is anticipated to be neutral or positively influence the community. First, a significant amount of uncontrolled, contaminated sediment will be removed and contained in a well-engineered confinement facility. Best management practices will be required to reduce noise and other short-term impacts from the construction. Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations.</p> <p>Community concerns are important to EPA and significant public outreach was conducted for the Terminal 4 project. Meaningful community involvement is planned for the design and construction phases of this removal action.</p>
58	2	"As a resident of Linnton and the environmental chair for Linnton Neighborhood Association, I was initially hopeful when I heard that there would be an early action cleanup of the Willamette River. This was followed by shock to find out that the preferred action by the Port of Portland and the EPA is to build a toxic dump in the river only 400 yards from our historical town of Linnton. Far from being an isolated area, we are a town with a proud history predating the -- Portland. Indeed, we were a thriving channel before the highway was widened in the '50s that raided half our businesses. Now we're a neighborhood of several hundred homes and more than a dozen businesses that live directly at where EPA plan to transform into a 15-acre toxic dump. My own doorstep is approximately 550 yards from the site in question.	Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see the response to Comment 2-2 .
58	3	The Linnton Neighborhood Association has several serious concerns with this plan. First of all, it destroys any hopes we have for a viable waterfront in Linnton. The Portland Bureau of Planning made some recommendations inspiring renaissance, indeed, defining it over a year ago, consisting of neighbors, business, industry, and other stakeholders, including the Port of Portland, in order to consider the design of a mixed use village in Linnton. Having a toxic dump 400 yards away would essentially dash any hopes of any investor wanting to participate in the development of our town. In addition, no parents would want their children to play in the proposed park or -- or the beach that's hundreds of yards from this toxic dump. This is personal. Would you want this toxic dump 400 feet from your home?"	Thank you for your input. Action is being taken at Terminal 4 because nobody should have to live next to uncontrolled toxic waste. It is incorrect to equate a CDF to a toxic waste dump. Please see the response to Comment 1-1 and Comment 2-3 .
58	4	Secondly, a 15-acre toxic dump adjacent to the river makes no sense,	It is incorrect to characterize the proposed CDF as a toxic waste dump. Please see response to Comment

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		and Jane Harris has already made some pretty good points about that. But what I do know is that even landfills on dry land leach eventually.	1-1 .
58	5	I'm very concerned about, you know, putting a toxic dump next to three earthquake faults and into a flood zone. And it makes no sense economically.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see response to Comments 2-6 and 2-8 .
58	6	Even if there are some savings in burying the waste that are going to be realized because they're going to -- we're going to take more waste from other polluters, the cost to our town, depreciation in property values and perhaps not getting our dream of having our village, is going to be amazingly expensive.	Our evaluation shows that all of the alternatives analyzed in the EECA will result in long term benefit to the community from reducing the risk of exposure to contaminated sediment. Note that the alternatives carried forward in the EE/CA are Alternatives A through D. The No Action alternative was not carried forward as it was found to not meet minimum threshold criteria.
58	7	"This is industrial sanctuary," we heard over and over again during our planning process, that this whole river is sacred industrial sanctuary, okay? And that was used as an argument against our developing our piece of the river. Why does it now make sense to take a 15-acre parcel and create -- create a parking lot out of it, when every single inch of this is supposed to be sacred?	Thank you for your input. Alternative C represents very low short- and long-term risk and is anticipated to be neutral or positively influence the community. Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations.
58	8	And then, finally, I think that this sets a really bad precedent in the sustainability community, and Portland is well-known as this incredible environmental city, and the EPA and the Port of Portland have been champions in the field of sustainability. I have personally sat -- and actually sat directly and applauded your good work. EPA grants have funded amazing projects. The Port of Portland has done wonderful work. Creating a toxic dump in the Willamette River and calling it cleaning up river will be seen by both friend and foe as a cynical move driven by money, whether it is or not	Thank you for your input. Please see the response to Comment 58-1 above. Cost was not a significant factor between the alternatives. Please see the response to Comment 5-3 .
58	9	Both the EPA and the Port of Portland have publicly supported the natural step, the four systems condition, precautionary principle, the cradle-to-cradle ideas. Please don't destroy our hope of a truly clean Willamette River for all generations to come by claiming that a toxic dump that's in a slip is the best solution for our beautiful river, for our town, and for our kids.	Thank you for your input. Please see the response to Comment 12-1 .
58	10	Many Linnton residents once played in this river, swam in the river, played -- we even have a wonderful little beach. Nobody plays there anymore. We dream that once again that we will have a viable waterfront.	Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. This Removal Action contributes to the long-term cleanup of the Willamette River.
59	1	We, as a neighborhood [Cathedral Park], have dealt with pollution in the river for quite some time. We dealt with a beach at Cathedral Park that's not usable.	Thank you for your input.
59	2	we have dealt with fish being not edible, and children having burned legs because of pollution.	Thank you for your input. EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done.
59	3	We have dealt with being a dump site in the past. I don't think we want to be a dump site in the future, too. And we're talking about an unknown quantity of time. We're talking about years and years and years down the line. So my concern is this is going to be a toxic area forever.	Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is dredged from the river placed into a well designed disposal facility that will protect people and wildlife. Please see the response to Comment 1-1 .
59	4	we are discussing a certain amount of risk here. There is risk. There	EPA will require a long-term monitoring program to ensure that any risk is minimized. Please see response

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		is not zero risk. There is possible risk.	to Comment 2-3 . In addition, please see response to Comments 2-6 and 2-8 for mitigating earthquake and flooding risks.
59	5	We're going to have to monitor it for, what, a thousand -- thousands of years? No one can guarantee what's going to happen in that amount of time. No one can guarantee that this is going to be a doable situation.	Monitoring is preferable to the risk of exposure to the uncontrolled contaminants presently in the river. Please see the response to Comment 42-2 .
59	6	People's health is not a minutia. I live in this community, and that's not minutia. Kids getting their legs burned by pollutants is not a good thing. We've dealt with this too long.	Protecting people and the environment from uncontrolled contamination is the reason a removal action was proposed at Terminal 4. Please see response to Comment 2-2 and Comment 2-3 .
59	7	It is time to pick up this pollution and move it someplace else, not next to the river and not next to our community.	EPA has noted your preference for off-site disposal. See response to Comments 1-1 and 2-2, 2-3 .
60	1	My name is Jim Robison. I'm a resident of the University Park Neighborhood, and I am also a member of the Portland Harbor Community Advisory Group. I just want to say that, first of all, I want this cleaned up as quickly as possible so I don't want long delays.	EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay.
60	2	But, also, I'm concerned that there are a lot of questions about this proposal, the preferred alternative, that have not been answered yet, and there was questions that were raised in the earlier part of the meeting tonight that I felt were not really very accurately answered when the questions were raised. So I'd like to get some more information about some of those.	Thank you for your input.
60	3	I will read the Chapter 8 that was mentioned about the risk factors because I'm afraid that when the alternatives were weighed, risk was not given adequate weight in the consideration, and I want to look at what the risks are because that is -- what we're looking at here is a long-term potential for failure, and we want to make the decision that is best for the long-term safety and long-term best that is this community, not just what's going to be the quickest and shortest and what's going to be the cheapest in the short-run, but what's going to have the best long-term benefit. So I'm very concerned that that long-term risk was not adequately weighed.	EPA will require a long-term monitoring program to ensure that any risk is minimized. Please see response to Comment 2-3 . In addition, please see response to Comments 2-6 and 2-8 for mitigating earthquake and flooding risks. As discussed in Section 8 of the EE/CA, factors evaluated for long-term risk can generally be divided into two categories and include: 1) the adequacy and reliability of the action to achieve the RAOs, and 2) the potential risk of the action relative to other alternatives. As described in the EE/CA, the preferred alternative includes approximately 76% of the removal action area to be either capped or dredged. This will achieve permanent isolation of contaminated sediments and reveal a sediment surface within acceptable concentrations. Monitored natural recovery (MNR) will be applied to the remaining areas, which is expected to achieve permanent reduction of contaminants to acceptable levels within 5 years. Therefore, EPA believes that the selected alternative will achieve the RAOs, is a permanent solution, and is both adequate and reliable. The other factor EPA considered is the risk of the action compared to the other alternatives. In this case, long-term risk generally includes situations which could impact the integrity of the CDF, such as earthquakes and floods. While earthquakes and floods were considered (see response to Comments 2-6 and 2-8), the review conducted by EPA indicates that the integrity of the CDF will not be compromised. The long-term risk associated with this action is not significantly different than the other alternatives, which each have unique risk associated with them (see EE/CA Section 8). Therefore, the action does not significantly increase the long-term risk compared to other alternatives and benefits of the preferred alternative (see response to Comment 1-1), outweigh any potential long-term risk associated with it.
61	1	We do have a lot of toxic problems out here in North Portland. And we need to remember that risk is a level of acceptance that we have to decide every day; what the risk is, what risk do we want to accept, whether it's storing it here, storing it somewhere else, or capping it.	Thank you for your input.
61	2	I want to make sure that's in the record that I want go in stating that I firmly am against any capping in our river. Whatever the other two solutions or three solutions we wish to go with, capping should not be	Your concern about capping has been noted. However, when the location is appropriate (no significant erosion or scour potential) and the capping is planned and implemented with care, capping can be a valuable tool for reducing risks posed by contaminated sediment. Thus, the benefits of capping, as well as

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		on the table for us to discuss. So whatever we go forward from out of here, the cleanup -- understands that the rest of the river cleanup, capping is not an acceptable option unless it can be done somewhere that is not going to be impacted by any of our natural environment activities, whether we have a natural event.	removal actions that contribute to the overall cleanup of the Portland Harbor, are two cleanup approaches that EPA selected for the Terminal 4 project.
61	3	The other thing is just I understand what we're trying to do with the CDF, and compared to hauling it to Arlington, we do end up storing it. We got to store it somewhere. So, then, once again, we have to look at the risk of moving it to the storage at Arlington, which is why they're exploring a CDF, which not blind. What is the level of risk contained in what sediments we put into a CDF, what's acceptable to take to Arlington.	It will be important to develop suitability criteria for determining which sediments present a low enough risk to be placed in a CDF and which ones need to be taken to an upland landfill. At this time, tests on the Terminal 4 sediment indicate that it does not meet the standards for hazardous waste disposal. The community will be involved in the process of developing these criteria. Please see the response to Comment 1-1 .
61	4	We are going to set the tone for the cleanup of this river, and I hope that we study it as individuals, as a community, and the EPA takes responsibility to know that this is going to set the tone for the cleanup.	Thank you for your input. The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. As such, the benefits or specific removal alternatives, such as a CDF or capping and contribution to the overall cleanup of the Portland Harbor, are significant balancing factors that EPA needs to consider related to the Terminal 4 cleanup. Whether additional contaminated sediments may be disposed of in the CDF will be decided in future cleanup decisions.
61	5	I appreciate all the effort that the Port has made into it and the community coming out. And I do want to take the time to thank everybody that has come here that will comment either personally or by e-mail. Please be aware of the whole cleanup process, not just the T-4, and become aware of how you can have input in that.	Thank you for your input. EPA appreciates your involvement and support. Please see the response to Comment 12-1 .
62	1	During my initial review of the course of the work, then, I was surprised by the comparison of risk between the preferred Alternative C, the CDF, and the landfill disposal, Alternative B.	Thank you for your input.
62	2	This CDF alternative is presented as being more protective of human and environment health based on being -- or having the least impact to the communities, least amounts of handling and transport, and prevention of sediment resuspension by hydraulic dredge. However, hydraulic dredge is -- speaks for -- for the landfill disposal options as well, and with the water being included the alternative which is not currently presented in the work plan. I know that dewatering works because I've been at the Columbia Boulevard Waste Water Treatment Plant many times, which is a very efficient -- economically and engineering energy efficient system for dewatering. That way, it's right across the street.	Hydraulic dredging is an attractive option for collecting and transporting contaminated sediments into the CDF. Hydraulic dredging for Alternatives A, B and D is considered in the EE/CA in Sections 8, Appendix B, Appendix J and Appendix Q, where it is noted that while hydraulic dredging may be feasible, additional constraints and impacts will result from the need to manage a significantly higher volume of water prior to transport to offsite landfills. As a result, after review of available information, hydraulic dredging combined with necessary dewatering for disposal in upland facilities does not appear to be practical for this project. Dewatering dredged sediment is difficult and requires specialized equipment and has significant space requirements. Based on the amount of sediment to be dredged, dewatering and transport off-site appears to be cost prohibitive. In addition, transport of wet sediment, if not dewatered onsite, also has numerous disadvantages. This includes obtaining a large amount of properly sealed containers and the higher potential for releases during transport.
62	3	In comparison of the risk of accidental releases, it's important to consider the probability and magnitude of consequences. The preferred Alternative C presents a much higher risk because the consequences of CDF failure and \$10 million worth of sediments going into the river are much more severe than, say, a railcar failing on its way to the landfill on an upland area. The CDF alternative may also be riskier based on probability.	<p>Thank you for your input. Potential risks from rail or barge transportation of contaminated sediment are very different than those posed by disposal within a CDF. For instance, the probability of a significant earthquake or flood impacting the CDF and releases of contaminated sediment is low. Please see responses to Comments 2-6 and 2-8 regarding earthquake and flooding issue.</p> <p>Potential risks posed by off-site transport, not only include releases via transportation failures (i.e. crashes, etc), but also include health and safety issues associated with handling contaminated material, which is much greater for the other alternatives. Therefore, when weighed together, the long-term risk associated with this removal action is not significantly different than the other alternatives, which each have unique risk associated with them (see EE/CA Section 8).</p> <p>Environmental benefits and factors used for selecting Alternative C include: 1) the amount of handling and transport of contaminated material is significantly minimized over other alternatives, 2) impact on the community is expected to be less since all construction activities associated with implementation of</p>

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			Alternative C is confined to the Terminal 4 facility, 3) the short-term risk of recontamination is minimized during implementation because a relatively small volume of sediment is moved over the shortest distance and because the contaminated sediment will be isolated from the river, and 4) the long-term risk of recontamination is reduced because it eliminates the Slip 1 area.
62	4	Unlike Commencement Bay which has been referenced several times tonight up in Tacoma, the proposed CDF is sited in a flood plain. In an earlier presentation, there was some -- the idea that there might be response to -- concerns about floods, which, as -- as I recall, there was no discussion for those, and there was very little discussion of floods within the work plan. So the Port is proposing that we cross our fingers for the next six years or more and hope that the floods of 1964 and 1996 don't recur. So I do have a question for the EPA, and that question is has EPA looked at aerial photographs of Terminal 4 in 1969 when that flood was occurring? Have they interviewed the folks, the longshoremen for instance, that were there in 1994, and the same in 1996? I recall that the aerial photos of 1996 covered the entire basin area with floods.	The proposed Removal Action has undergone an evaluation by EPA to make sure that flooding events were adequately addressed in the evaluation of Alternatives. As part of the review, aerial photos were evaluated, including the 1996 event. As a result of public comments, EPA will require the CDF design to consider flood events. The additional performance standards are further discussed in the Action Memorandum. Also see response to Comment 2-8 .
62	5	Beyond the port being sited in a flood plain, there's also the potential for a seismic event to occur that will be similar to the 1989 Loma Prieta earthquake. It's a very unusual earthquake, I think it's low probability, but the magnitude of the consequences are similar to a large flood event, and in that earthquake, there's still the action of refill in the south of Market District in San Francisco.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic event are adequately addressed. Please see the response to Comment 2-6 .
62	6	So in my opinion, the combination of the CDF being sited in a flood plain on infill presents an extremely high risk to our community. I'm confident that if EPA performs a critical engineering analysis of the risk, that they will result in the same opinion.	Based on multiple comments like yours, EPA required a review of the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain relatively low-level contaminated sediments and is a permanent solution to eliminate potential exposure to human health and the environment. It was also determined that the long-term risks do not outweigh the environmental benefits of the Terminal 4 project.
62	7	There's a couple of reference documents. I'd like to refer EPA to the American Institute of Chemical Engineers documents on hazards evaluation that includes both seismic events and flood events.	Thank you for your input.
63	1	I find reports -- cost analysis lacking. They talk six years, eight years, ten years, fifteen years. They build an airport -- an airport near Progress Villa in Swan Island. It's gone. That's less than a hundred years ago all that occurred. It was a dry dock. Many thousands of dollars were put into it. It disappeared.	The cost analysis presented in Appendix O of the EE/CA was completed consistent with EPA's NTCRA guidance. The costs include both capital expenditures for construction and long-term operation and maintenance. In all cases, removal actions with a capping and/or CDF component, costs for long-term operation and maintenance were estimated for a period of 30 years. In addition, it should be noted that a number of institutional controls will be implemented as part of the action, which will allow EPA to track the project and ensure that the remedy selected is not compromised. Proposed institutional controls include lease language and notifications and easements that preclude any subsurface disturbance of the CDF.
63	2	There's the soda ash sheds that we've been promised that ash would not flow across the neighborhood, it's going to be monitored. Last week, it was drifting across the neighborhood. Are they monitoring it? There's a fire at Schnitzer. Nobody was monitoring that. That's from the Port.	Thank you for your input. Because the dredged material will be wet, it is not anticipated that dust will be generated by the project. At the time the top cap material is placed in the dry, measures will be required to minimize dust blowing into the neighborhood.
63	3	I think that the cost analysis is only, as the Port has done it, for a limited time. The waste proposal is for an indefinite period of time. Why not make the cost analysis for that same length of time with all the variables that are in there?	The cost estimates for the Alternatives were prepared in accordance with established EPA regulatory guidance. All of the alternatives were evaluated using the same set of cost numbers and criteria. EPA is satisfied with the cost estimates provided by the Port.
63	4	I do not trust what's going on. I think that there were some people that mentioned the social aspects. Well, part of the social aspect is	Thank you for your input. Please see the response to Comment 12-1 .

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		the trust in the neighborhood, and that is lacking. I don't trust them. We've been fooled before. We should not have a Superfund site rebuilt as another Superfund site. Thank you.	
64	1	I reside across the river, a little bit south of Linnton. I'm up on a hillside, and I get to watch what goes on in the river every day. And I see the ships come by, and I see the tug boats go by, and I see the Toyota ship come in, I watch the wonderful longshoremen do their job, and I see the soda ash, and I dust every day because of the soda ash. I also see the fires that go on at Schnitzer Steel, the little car explosions that rattle my windows, and the big fires that occurred most recently just a couple weeks ago. And I'm looking at all of this, and then I pick up the Oregonian and I find out that in my beautiful view, I'm also going to have a toxic waste dump site, and I'm -- and I have not even really thought about this much before. It made me so mad, that I sat down and wrote a letter.	Thank you for your input. Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. The risk of fire and significant dust from the Terminal 4 removal action is very low as the material being handled will be non-flammable wet dredged sediment.
64	2	Toyota would want to use a parking lot that sat on a toxic waste dump site, that is next to Schnitzer with exploding automobiles and causing fires and fumes to come all over those lovely Lexuses and Avalons and Toyotas? That's what Toyota would want? It certainly wouldn't want me to buy a Toyota, and I don't even drive a Toyota at this point.	The proposed alternative reduces or eliminates exposure to contaminated sediments and the CDF should not affect the potential Port uses on the upland portion of the facility.
64	3	But I'm also wondering, if little comments like that are going by, what else in this presentation that was technical that I didn't quite get it went by me and maybe went by you? And I'm opposed to all of this, and I intend to write my congressman.	Thank you for your input. In order to make a good decision, EPA must consider a wide range of technical, economic and community factors.
65	1	I'm simply a resident of the Cathedral Park Neighborhood, and we live between the McCormick Baxter and Terminal 4, two polluted sites of course. And it seems -- it makes sense to me that we should probably dispose of this waste on site if it makes sense.	Thank you for your input. Please see the response to Comment 2-2 .
65	2	It doesn't make sense to dispose of it, of course, that's going to reenter the river or cause problems due to natural causes like earthquakes and floods.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed. Please see response to Comments 2-6 and 2-8 for earthquake and flooding issues and 2-3 and 5-2 for long-term reliability and safety.
65	3	<p>However, I asked the question and didn't get a clear answer, but, apparently, there's another way of handling this, and in watching the slide presentation this evening, however term it is -- the water word for it, I realized that this is a built-in opportunity, it would seem to me, to the Port for disposing of this toxic waste. That is to say, they have a bathtub essentially next to another bathtub, and they're going to pump one bathtub into the other.</p> <p>The thing to do, then, is to line this bathtub in such a manner that nothing's going to get out of it, it's going to be an impervious liner, such as some of the things they're using in waste disposal sites throughout the world. We've come a long way in waste disposal sites, and there are ways of making them impervious, just move them around in case of an earthquake and also keep the water out in case of flood. And I think it would be the closest one we can get to a guarantee that this toxic waste stay where it's supposed to if they put a 20-foot cap on it and monitors on all corners of the compass. This is going to cost a little more than, it appears, the proposed plan one</p>	Based on engineering factors, lining the CDF is not practical or needed (see Appendix K of the EE/CA). Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is dredged from the river placed into a well designed disposal facility that will protect people and wildlife. Liners are typically used to prevent leaching of chemicals through the bottom of the disposal facility and into the environment. The sediment to be disposed in the CDF is non-leachable; therefore, a bottom liner is not needed. In addition, it should be noted that contaminated sediment is being consolidated into a CDF primarily to mitigate potential for direct contact of these sediments in the river environment. CDFs and other in-water confined disposal facilities have been successfully used at the Commencement Bay Superfund site.

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		would be, but it would cost a heck of a lot less than taking it to Arlington, which is really moving the problem from one part of Oregon to the other.	
65	4	So I would propose some thought be given to what is being done at McCormick Baxter, and that is driving sheet metal down into the earth and then placing a liner inside that, putting the toxic waste inside that liner, and putting an impervious clay-like soil on top of that. In other words, make a great big sausage with the thing inside of it. And then it wouldn't make a whole lot of difference whether it's a parking lot on top of it or a manufacturing company. And I would like to be assured at least some consideration might be given to this proposal.	The specifics, including contaminant concentrations, of industrial operations that generated the contamination and characteristics of the McCormick and Baxter site and the Terminal 4 site are very different. Only sediments that have low likelihood of leaching will be allowed in the CDF.
66	1	<p>I have what might seem like a relatively small and technical question for the EPA. It has to do with the cost estimates for the four options, in the report -- the spec report that I was reviewing. It looks like that part of the decision for Alternate C relies on a \$10 million dollar estimate cost recovery that EPA or whoever pays it would get because you not only have the dredging from this particular situation, but you'd also have future dredging of sediments that will be put into the site, so you actually save money towards the future, so that goes to the estimate for the cost. I'd like more maybe justification from EPA about sort of the accounting of this. It seems to be an interesting sort of -- in a sense, not tricked, but interesting way of doing things.</p> <p>So what it does is two things. First, it takes an estimated sort of value of future sediment going into the site, which we can't be sure now that it's definitely going to go in this site, but they're saying, well, we'll find some sediment somewhere, the other Superfund materials or there will be other sediment from other dredging that will go in there, but assuming that, not so ensuring that. So that's a little bit of a tricky thing in terms of the money. And that's key, because by allowing that \$10 million estimated value for future sediment that's going into the site, it takes what's the most expensive of these four options and makes it the least expensive. If you look through the EE/CA draft report, it's actually option -- Alternative C is the most expensive up front, but with this estimated value, goes down to the least expensive.</p> <p>The second thing it does is it sort of biases the future decisions, because, if you think about it, the next time we come to a meeting where we're going to talk about some other slip or some other area we're thinking about options, one of the options will be taking the sediment and putting it in this same spot. Well, we will already have sort of done that. We will restart that process of setting up a toxic waste dump in that other slip, so we're truly biasing future decisions as well. So it's something that I'm hoping that EPA could give us some more information about, sort of about how this accounting works, and how and in what ways this won't bias future decision making, because it seems to me that it will bias it.</p> <p>Now, all that said, does this make this the wrong decision? I'm still not sure. I haven't looked at this in a lot of detail. But I just want to -- I</p>	<p>The estimated costs presented within the EE/CA reflect a conceptual stage of development of each alternative, generally about 10 to 15 percent of design level. In general, the cost estimates were prepared in accordance with regulatory guidance for cost estimating. EPA guidance provides that estimates should provide values within +50 percent to -30 percent of actual short-term and lifecycle costs for each alternative evaluated.</p> <p>The EE/CA costs reflect the Ports experience with past projects. The anticipated cost associated with landfill disposal (i.e., includes the cost of transportation and disposal fees) was estimated at approximately \$30 per ton. This unit rate was used for all alternatives where applicable (i.e., Alternative C and D). According to the Port, they have paid \$28.85 per ton (2003) and \$30.87 per ton (2004) for landfill disposal and trucking costs. As such, the \$30.00 per ton appears reasonable. Based on the nature of sediment (i.e., soil type and degree of saturation) a conversion factor of 1.6 tons per cubic yard was applied. As a result, the disposal unit rate was determined to be \$48.00 per cubic yard (i.e., \$30 per ton × 1.6 tons per cubic yard). The low end of the disposal cost was selected to be \$24 per cubic yard (i.e., one-half of the high-end cost, with the most likely unit cost being \$30 per cubic yard). The resulting total benefit of the CDF excess capacity (i.e., 560,000 cubic yards) was then calculated to be \$16,800,000. Due to uncertainties associated with the timing and the market-driven nature of the benefit, the total calculated value was discounted by 40 percent, resulting in a dollar value of approximately \$10,000,000.</p> <p>The CDF does not bias EPA's future decisions. Although the CDF may be an additional disposal option to consider in future cleanup decisions, whether or not the CDF will be determined to be appropriate for the sediment being dredged and/or a protective alternative will need to be evaluated and a decision related to that cleanup will be made. As previously mentioned, prior to accepting and/or placing any additional contaminated sediments within the CDF they will be screened to ensure that they are of similar nature as the final screening criteria developed for the CDF. Having an on-site disposal facility may generate more interest by other facility owners to address contamination at their sites sooner, if they believe that the CDF may be more efficient, implementable or cost-effective. However, EPA's review of such a proposal will need to consider the protectiveness of disposal in the CDF compared to other cleanup approaches or disposal options.</p>

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		want EPA to really think more -- or tell us more, tell the citizens more, about this accounting through the process, because it seems a little bit problematic at best. Thank you.	
67	1	It's really interesting to sit through these processes which go on every time something important is happening in the community regarding pollution in the river, and I recognize how much all of us are disadvantaged because we don't know how to read an EE/CA and know what it's saying.	EPA values and encourages public comments on projects affecting the community. EPA tries to conduct a variety of public outreach activities that help non-technical community members understand the information presented in the EECA in order to make informed decisions.
67	2	I have a strong prejudice in favor of the preferred method because I don't want to see these sediments, which are a limited class of toxic waste which I don't think would be destined for Arlington if they left here. I think that this is a level of toxicity that, as a community, we can take responsibility for.	EPA agrees that the proposed action is an appropriate choice to protect human health and the environment. Based on existing information, the sediment at Terminal 4 passes the typical tests for characterizing material as hazardous or non-hazardous waste. Given the selection of an on-site disposal facility, the Port will remove more sediment from the environment and place it in a well-designed disposal site.
67	3	I don't think that we can depend on the Port, and I'm even more concerned about the other -- the other potential responsible -- the PRPs to take responsibility for anything that's capped or anything that's stored along the river. I think that it's important that we recognize that the only people who can really take responsibility for that -- for those toxins are our community.	Thank you for your input. Under the Superfund laws, viable Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs.
67	4	I'd really like to challenge the EPA to define for us the length of time that there is risk involved in anything that's stored along the river, what things need to be watched and need to be monitored, not just assign that responsibility to some company which may not be around, or which may have different leadership, or may have different funding, or who knows what, sometime in the future, so that we, as a community, can know what's here and how we can take responsibility for it.	Please see the response to Comment 2-3 . A monitoring system will be established at the Terminal that will not only evaluate the effectiveness of the CDF but all other Remedial Actions implemented. The Port, being a public agency, has long-term stability and responsibility for the action implemented.
67	5	Dumping it someplace else is going to put it in some other community's lap, and I have no idea -- I have even less confidence that that community is going to take good care of it. But on the other hand, I -- right now I have no idea what's the responsible caring for these toxics.	Sometimes there are no easy answers to problems and that is why the EE/CA looked at a number of cleanup alternatives in order to find one that best meets site-specific needs and other evaluation criteria. Please see the response to Comment 12-1 .
67	6	I don't think that the EPA is doing its job unless it can inform us, as concerned citizens, how we can take care of this problem, not just for the next five years, but for the next hundred years.	EPA believes that construction of the CDF is a long term permanent solution and also contributes to the cleanup of the overall Portland Harbor site. Please see the response to Comment 1-1 .
68	1	I am sending you my objection to the Port of Portland plans to dredge slip 3 at Terminal 4 and fill it with toxic waste, then cap it with concrete and monitor the site.	EPA has noted your objections to this project. Please see response to Comment 1-1 .
68	2	First, it seems to me that mitigating one Superfund site on the Willamette River by creating a new one is ludicrous. There are already available in Oregon suitable toxic waste disposal sites without creating new ones.	The Terminal 4 removal action is within the initial study area of the Portland Harbor Superfund Site. The CDF will be constructed within the existing Superfund site and will not create a new site. The Terminal 4 cleanup takes uncontrolled contamination and places it in a secure and manageable environment. Please see response to Comment 1-1 .
68	3	Yes, the cost of such disposal would probably be higher economically, but for the protection of the Willamette/Columbia system, there is no justification to create a new superfund site. The cost to our environment could be far above the difference in cost of proper disposal of the material involved. The Port's proposal is short-sighted thinking.	Thank you for your input. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife. It does not mean just moving it from one place to another or creating a new contaminated site in the river. Slip 1 contains contaminated sediment that needs to be addressed as well. The ability of the selected cleanup option to generate income for the Port of Portland was not a factor used in evaluating alternatives.

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68	4	Secondly, the Port's decision to create a new Superfund site within the Port of Portland would be a decision to condemn an actual and potentially useful asset of the Port. What legitimate business would want to lease a site that has proven contaminants? No matter what was written into the lease, the lessee would share responsibility for the site. There are not unlimited berths available on the Willamette/Columbia system with rail, truck and barge access. Contaminating an existing site simply destroys another viable Terminal.	Construction of the CDF will provide approximately 17 acres of land surface in the Slip 1 area of Terminal 4. The additional land will be retained by the Port for water-dependent uses consistent with its current core marine businesses. Marine loading and offloading facilities will be modernized and relocated to the riverfront, increasing efficiency of maritime operations.
69	1	The last place a toxic dump should be located is in an area where people live and work!!!	Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see response to Comments 1-1 and 2-3 .
69	2	The proposed dump is yards from Linnton's community center -- it is the heart of our town. It is a location where parents leave their children before and after school, all the while trusting they are in a safe environment. We all deserve the best environment for our families to live in. The people of Linnton work hard to make this area a safe and wonderful place.	Thank you for your input. Please see response to Comment 2-2 .
69	3	I know there are alternatives to the current plan and I ask you to PLEASE find another alternative to creating a toxic dump at slip !, Terminal 4 in the Linnton neighborhood!!	Please see response to Comment 4-4 .
70	1	we favor capping and natural recovery whenever possible.	Capping and monitored natural recovery can be valuable tools for reducing risks posed by contaminated sediment. Each of those actions are included as part of this Removal Action where it was determined safe to cap contaminated sediment and where contamination concentrations was low enough and the dynamic system of the river system was likely to attenuate the contamination.
70	2	In areas where dredging is a necessity, we want dredge spoils removed from the Willamette River and deposited in a secure upland facility, where they are not a future hazard to the river or ground water.	Thank you for your input. Please see response to Comment 1-1 .
70	3	We oppose the use of Terminal 4, Slip #1 as a low-level waste depository. It makes no sense to remove waste from the main Willamette River and deposit the waste adjacent to that same river. This is an unproven technology, and we do not want a situation to arise where the procedure would have to be redone in future years.	Please see response to Comment 1-1 . Only sediments that have low likelihood of leaching will be allowed in the CDF. CDFs and other in-water confined disposal facilities have been extensively used in the Northwest. No difficulties were encountered at these CDFs. Based on available information, all CDFs in the Pacific Northwest function as intended.
70	4	We are concerned about possible leakage of contaminants from this fill area even though we understand that the safeguards by today's technology would be employed.	Due to the proposed criteria for construction of the CDF, leaching of substances is not likely. In addition, suitability criteria will be established for evaluating material that would be placed in the CDF and ensuring that they do not include contaminants that would dissolve or leach. Please see the response to Comments 2-3 and 5-2 .
70	5	Fish and wildlife habitat will be lost if the area becomes a low-level waste depository and appears to us to be a poor environmental choice.	A Biological Assessment (BA) evaluated the potential effects of the Preferred Alternative on Federally listed and proposed threatened and endangered species. There will be unavoidable loss of habitat through creation of the CDF and dredging Slip 3 for which appropriate mitigation will need to take place. Please see the response to Comment 6-2 .
71	1	This letter is in regards to cleanup of contaminated river sediments at the Port of Portland's Marine Terminal 4 on the Willamette River. We operate a flour mill at Terminal 4 which is located adjacent to one of the four sites listed as alternatives for the Portland Harbor Superfund site cleanup. Given the opportunity for public comment, we asked our environmental expert to review the plans and they have expressed the following concerns with the proposed site located at Slip No. 1.	Thank you for your input.

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71	2	<p>At the current stage of development, the proposed early action remedy for the Portland Harbor Terminal 4 superfund site presents significant concerns for potential cross-contamination of hazardous constituents in the sediments to be dredged and Cereal Food Processors (CFP's) grain storage and processing operations. Hypothetically, such cross contamination could occur via migration and deposition of aerosol or dust generated by the dredging & disposal activities, or volatilization and air transport. Once airborne, contaminants from the sediment dredging activities or transfer into the proposed confined disposal facility in Slip No. 1 could migrate into CFP's grain processing operations through the following pathways:</p> <ul style="list-style-type: none"> - Deposition of fugitive dust or aerosol into the open air unloading pit where grain in railcars is emptied into a concrete pit that discharges through a screw conveyor into an elevator leg that transfers it into storage silos. - Migration of fugitive dust or aerosols into the facility buildings through natural draft openings (windows, doors, open vents) or through the forced-draft ventilation system, with subsequent deposition inside the processing plant. - Intake of vapors, fugitive dust or aerosol through blowers that provide airstreams for pneumatic conveyance of grain and milled product throughout the processing plant. Many of these blowers pull their make-up air from external locations where intake of the potentially airborne contaminants could occur. <p>These potential contaminant migration pathways are significant concerns to CFP, given the close proximity of the proposed confined disposal facility to the CFP operations (the center of our facility is approximately 400 feet from the north edge of Slip No. 1) and the fact that the CFP would be downwind of Slip No. 1 for a considerable amount of time. The Portland Oregon Wind Rose indicates that the most prevalent wind direction (from the south) is directly in-line with the center of Slip No. 1 and the CFP facility, and that some portion of Slip No. 1 would be upwind of CFP for approximately 50% of the time.</p>	<p>It is highly unlikely that dredging or disposal of contaminated sediment from Terminal 4 would result in detectable concentrations of dust, aerosols, or vapors. The removal action design will include a provision that contaminated sediments must be wet when they are being transported and placed. This will significantly minimize the potential for airborne contaminants at any time. In addition, due to the nature of the contaminants present in the sediment, they are unlikely to volatilize at concentrations which would be detectable in air. However, as part of the overall health and safety plan, EPA will require some air monitoring, likely in the form of minirae or other similar technologies. Please see the response to Comment 2-7.</p>
71	3	<p>With respect to potential contamination of CFP's grain-processing operations, of the suggested alternatives (capping, monitored natural recovery, and dredging), capping and monitored natural recovery are least likely to adversely impact the grain operations.</p>	<p>Capping and monitored natural recovery can be valuable tools for reducing risks posed by contaminated sediment under the appropriate circumstances. The preferred alternative includes areas which will be capped or allowed for monitored natural recovery. However, EPA has determined that some contaminated sediment needs to be removed due to the risks posed and the area they are located in is an area where active commercial shipping uses could affect the long-term integrity of a sediment cap.</p>
71	4	<p>Dredging has the greatest potential for adverse impacts, since contaminated sediments would be disturbed and exposed to the air when pumped or directly transferred into a barge or directly transferred into the confined disposal facility. These activities could allow for evaporation of volatile compounds or generate an aerosol containing hazardous constituents. Also, any contaminated sediments that are spilled or otherwise deposited onto dry surfaces (e.g. the edge of the Slip or deck of barges/dredging ships) could dry</p>	<p>Thank you for your input. Please see response to Comment 2-5.</p>

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		and become available for formation of fugitive dust if disturbed after drying.	
71	5	Should dredging become the selected alternative, disposal options include on-site disposal in a confined disposal facility or off-site disposal in a landfill. Both of these alternatives require sediment dewatering and transport, and would have comparable potential for volatilization and the generation of other air emissions described above. However, as proposed, the confined disposal facility would be constructed with excess capacity. This could extend the overall operation schedule of the unit, allowing for disposal of sediments removed from other contaminated sites, and would delay the final capping of the confined disposal facility. There may be problems associated with potential air emissions and other long-term maintenance of the confined disposal facility if it is left uncapped for an extended period.	Sediments to be disposed in the CDF will not be dewatered, thus minimizing the potential for airborne fugitive dust. A Removal Action Area-specific Health and Safety Plan (HASp) outlining and detailing mitigating measures against potential hazards such as air emissions during construction and operational activities will be prepared and adopted. Short-term impacts to the environment will be minimized by adopting appropriate dust control mechanisms. Please see response to Comment 2-7 . A temporary cover will be required after the CDF has been filled with sediment from Terminal 4. A maintenance plan will be adopted for this cap to limit fugitive dust. However, the temporary cap will consist of clean fill material. If it is decided that additional contaminate sediment can be disposed of in the CDF, similar controls during disposal will also be required by EPA for these actions.
71	6	Based on these concerns, CFP opposes the early action remedy currently proposed for the Portland Harbor Terminal 4 superfund site. If this remedy is approved, CFP reserves the right to comment on the confined disposal facility operation and maintenance plan and the type of future waste that could be disposed in the unit. We also reserve the right to review and provide comments on the design and construction documents, including the structural design and Construction Quality Control (CQC) plan.	Your participation in the design phase and development of suitability criteria for materials to be placed in the CDF is welcomed. Please see the response to Comments 1-1 and 12-1 .
71	7	For any remedy proposed for this superfund site, CFP would request that a series of best management practices be employed, including air monitoring during all operating periods, dust suppression/control, spillage control, protection of our grain processing operations with a construction-free zone, and in-place plans to respond in the event of an air-monitoring exceedance. It may be possible to time construction activities with prevailing wind direction and intensity in the most favorable conditions, to minimize impacts to the grain operations.	Please see the response to Comment 2-5 . A Removal Action Area-specific Health and Safety Plan (HASp) outlining and detailing mitigating measures against potential hazards such as air emissions during construction and operational activities will be prepared and adopted. Short-term impacts to the environment will be minimized by adopting appropriate control mechanisms (e.g., dust control) and adhering to legally applicable requirements. In addition, a detailed Removal Action work plan will be prepared describing the construction activities and their schedule, procedures to protect the public, site workers and the environment during all field activities.
72	1	As good river stewards, we appreciate the effort put forth by all in cleaning up the Portland Harbor, but are concerned about contamination if the method of cleanup allows downstream migration of these contaminants. This could be a catastrophe for any affected properties when it's time to dredge.	EPA did not evaluate any alternatives that would allow downstream migration of contaminants. Please see the response to Comments 2-3 and 5-2 .
72	2	We suggest two actions; the first being a sampling effort to establish solid baseline knowledge of river sediments downriver in the channel. The second would be a repeat sampling during and after the project to assure you and our members that little or no migration occurred.	In evaluating the long-term effectiveness of the Removal Action, EPA has identified a number of post-removal site controls that will be implemented. These include periodic monitoring, sampling and analyses to evaluate the progress of the MNR and to verify the long-term adequacy of the performance of the sediments caps. Post removal action confirmation sampling and analysis will also be conducted after construction to provide direct measurement of residual concentrations. In addition, sampling being completed as part of the Portland Harbor cleanup may also be used in evaluating the Removal Action efforts. More detail on post removal action monitoring can be found in the EE/CA in Appendix K.
73	1	- it is a dumb idea. No matter how powerful the economic or political or expedient, placing hazmat in Slip 1 on the Willamette River "is a dumb idea".	EPA has noted your objections to the project. Please see response to Comment 1-1 .
73	2	- as professionals you know the power of water. And you know as well, rivers are ecologically active events; they flood; silt; meander; erode. Rivers cannot be contained for long – ask the corps of	Based on community concerns, EPA reviewed the adequacy of the CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments at the Slip 1 location. Please see response to Comment 1-1 .

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		engineers about the Mississippi – no dam, berm, containment liner can last. The river will breach it.	
73	3	Why are we even talking about placing hazmat at the river's edge – when a viable, common sense alternative exists? At hand we have a railroad, bulkrolling stock, and a dry, benign site in Eastern Oregon willing to accept and monitor the disposal of Willamette Hazmat. ALTERNATIVE D. You must do the right thing – not the expedient thing. You must use common sense. Placing hazmat anywhere along the Willamette is “a dumb idea”. It sets a bad precedent.	EPA has noted your preference for upland disposal. Please see response to Comment 1-1 .
74	1	After reviewing the EE/CA for the Port's proposed Early Action at Terminal Four, comments from Golder Associates (Golder Technical Memorandum, August 3, 2005), listening to citizen comments at the public hearing, talking with the Duwamish River Cleanup Coalition, discussions with our own technical advisors, and lengthy discussions amongst ourselves, we have come to the decision that we cannot support the Port's preferred alternative at T-4.	Please see the response to Comment 12-1 .
74	2	In our view there are too many questions about the long-term impacts of this project. The CAG feels strongly that this proposal is not protective of public health and the environment and that the unresolved issues preclude the use of the CDF as a remedial action at T-4.	<p>EPA has noted your objections to this project. As discussed in Section 8 of the EE/CA, factors evaluated for long-term risk can generally be divided into two categories and include: 1) the adequacy and reliability of the action to achieve the RAOs, and 2) the potential risk of the action relative to other alternatives. As described in the EE/CA, the preferred alternative includes approximately 76% of the removal action area to be either capped or dredged. This will achieve permanent isolation of contaminated sediments and reveal a sediment surface within acceptable concentrations. Monitored natural recovery (MNR) will be applied to the remaining areas, which is expected to achieve permanent reduction of contaminants to acceptable levels within 5 years. Therefore, EPA believes that the selected alternative will achieve the RAOs, is a permanent solution, and is both adequate and reliable. The other factor EPA considered is the risk of the action compared to the other alternatives. In this case, long-term risk generally includes situations which could impact the integrity of the CDF, such as earthquakes and floods. While earthquakes and floods were considered (see response to Golder Comments), the review conducted by EPA indicates that the integrity of the CDF will not be compromised. The long-term risk associated with this action is not significantly different than the other alternatives, which each have unique risk associated with them (see EE/CA section 8). Therefore, the action does not significantly increase the long-term risk compared to other alternatives and benefits of the preferred alternative (see response to Comment 1-1), outweigh any potential long-term risk associated with it.</p> <p>In addition, it should be noted that the location of Slip 1 to be used as a CDF was considered as part of the EE/CA. The availability of Slip 1 within the removal action area, its current configuration, the proximity to other Portland Harbor sites, and location to transport of sediments were all factors in selecting the location of the CDF in Slip 1. In addition, the use of Slip 1 as a CDF also contributes to long-term protection by eliminating the potential for recontamination because the Slip 1 sediment area will be eliminated.</p> <p>Also see response to Comment 75-4.</p>
74	3	Specifically, we have concerns about the viability of the proposed facility in both earthquake and flood conditions and many questions about the long-term ecological and human health impacts.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see the response to Comments 2-3, 2-6, 2-8, and 5-2 . Based on the multiple comments like yours, EPA thoroughly reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments.
74	4	This CDF, as the Port has pointed out, is a landfill operation and, as such, must meet Federal and State regulations for landfills. These include detailed studies of active faults within 3000 feet of the CDF site; locating no closer than 200 feet of an active fault (defined as	The CDF is not a landfill as defined under federal solid or hazardous waste regulations. Relevant State of Oregon landfill regulations were determined not to be ARARs for the Terminal 4 CDF as they are equal to federal requirements under CERCLA and the Clean Water Act. Significant analysis and consideration was conducted on earthquake consequences related to the CDF.

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		<p>movement within the last 10,000 years) for solid waste, and 1,320 feet if the waste is classified as hazardous; the CDF must be designed for a maximum horizontal acceleration with a 2,475-year return period. The report from Golder Associates suggests that adequate analysis of the risks from earthquake has not been done and that compliance with applicable Federal and State laws for landfills in earthquake zones will ultimately not be achievable.</p> <p>The Port's consultant, BBL, ignored the potential for liquefaction of the CDF berm, the hydraulic soils placed behind the berm and the soils adjoining the berm. The Golder analysis predicts that approximately 30 feet of alluvial soil is anticipated to liquefy at the toe of the CDF berm and that approximately 20 feet of alluvial soil is also anticipated to liquefy beneath the berm during a CLE earthquake. Risks of this nature are unacceptable to the public and relying on an engineering fix after federal approval skirts applicable laws and would require further public comment.</p>	<p>Please see responses to Golder Comments 1, 2, 3, 5, and 6.</p>
74	5	<p>The conceptual design for the berm does not address potential erosion or scour along the river side toe of the berm during peak flood events. Regulatory requirements for disposal of contaminated materials in floodplains state that a proposed facility cannot "expand or modify a landfill in a floodplain in a manner that will allow the facility to result in washout of solid waste so as to pose a hazard to human life, wildlife or land or water resources." The proposed CDF design does not adequately address this criterion with respect to provisions for bank erosion from the dynamic movement of the river or scour. It also does not address erosion along the toe of the berm during peak flows or in the event of an earthquake.</p>	<p>Please see response to Comment 84-3.</p>
74	6	<p>A section on recontamination/re-suspension is missing from the report. The impacts of deposition and erosion along the river and the impact on dredging, capping, the CDF berm, and natural attenuation should be given significantly more discussion and consideration.</p>	<p>The recontamination analysis will be completed just prior to the initiation of cleanup. The EE/CA provides preliminary discussion of recontamination/re-suspension and the impacts of deposition and erosion along the river and what the impacts of dredging, capping, and natural attenuation are. The EE/CA notes where additional data related to sediment re-suspension and deposition within the Removal Action Area are being collected as part of the ongoing post-Removal Action recontamination analysis. For example, within Appendix D – Summary of Hydrogeological Characteristics information was provided and evaluated with respect to contaminant transport aspects of the Removal Action Alternatives and Appendix G – Summary of Hydraulics and Sedimentation Characteristics presented data on sediment deposition.</p>
74	7	<p>In summary, this proposal for a confined disposal facility in the Willamette River is not rigorous enough in design to provide adequate assurances to the public that it will withstand both earthquake and potential flood events. Furthermore, additional questions remain in regard to this site's projected lifetime and the level of monitoring and maintenance that would be required.</p>	<p>The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Based on the multiple comments like yours, EPA thoroughly reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments. In addition, EPA will require post-removal action monitoring to ensure that the CDF is meeting intended performance criteria. The preliminary design of the CDF includes monitoring for a period of 30 years. Please see the response to Comments 1-1, 2-6, 2-8 and Golder Comments.</p>
74	8	<p>Even if it were redesigned to be more protective, the CAG feels that there are too many uncertainties associated with the immediate and long-term impacts of this proposed facility which would be the first of its kind to be built in a river.</p>	<p>Thank you for your input. EPA believes the analysis presented in the EE/CA addresses many of the uncertainties. CDFs and other in-water confined disposal facilities have been successfully designed and used and is not unproven.</p>

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74	9	In discussing alternatives to the CDF that will provide a timely and thorough clean up, the CAG feels that a variety of methods should be used. We urge EPA to continue to seek alternative technologies that could be used for the whole project and possibly combined with other CERCLA cleanups in the Northwest. In our view, it makes most sense to remove these sediments from the river, treat them if possible and then, depending on remaining contamination levels either dispose of them in an upland landfill or reuse them for some other purpose.	Please see the response to Comment 1-2 for the explanation of how the Terminal 4 EE/CA evaluated the feasibility of treatment technologies.
74	10	We also support capping and natural recovery where appropriate.	Capping and monitored natural recovery can be valuable tools for reducing risks posed by contaminated sediment under appropriate circumstances. The preferred alternative utilizes both of these technologies as components of the action.
74	11	The CAG also wanted to convey their strong desire to have hydraulic dredges used to minimize the level of re-suspension.	Discussion of hydraulic dredging can be found in Appendix J of the EE/CA. Hydraulic dredging is desirable in placing materials in the CDF and we agree it will be useful to reduce resuspension and possible migration beyond the removal action area. Hydraulic dredging will be further evaluated during the design phase of the project.
75	1	Waste Management Disposal Services of Oregon, Inc. and Chemical Waste Management, Inc. (collectively "Waste Management") appreciate the opportunity to submit the following comments on the above-referenced EE/CA Report. In Oregon, Waste Management owns and operates three solid waste landfills and one hazardous waste landfill. The company not only manages and disposes of municipal solid waste, it also manages significant quantities of materials from contaminated site cleanups, including contaminated sediments and soils. We are therefore keenly interested in decisions made concerning remediation alternatives for these kinds of cleanups.	Thank you for your input.
75	2	While Waste Management would typically not comment on environmental cleanup documents at a site not directly involving Waste Management, we are very concerned with the Terminal 4 EE/CA Report because of the unwarranted and unsupported negative evaluation of upland landfill disposal as an appropriate and effective cleanup alternative for the Terminal 4 project. The Terminal 4 Early Action EE/CA Report is proposing what can best be characterized as an unpermitted, unlined solid waste landfill with excess capacity that will compete against permitted landfills for third party waste volumes.	<p>Off-site disposal was considered in the EE/CA as a viable and effective disposal alternative. However, based on the overall evaluation of the alternatives, the CDF alternative was selected for the Terminal 4 removal action. See response to Comments 1-1, 74-2, 75-4, and 75-6 regarding evaluation of the alternatives and long-term risks.</p> <p>Federal solid waste landfill requirements are not applicable or relevant to disposal of contaminated dredged sediment in an on-site confined disposal facility. Relevant State of Oregon solid waste regulations were determined not to require more than the requirements imposed by CERCLA and the Clean Water Act. Please see the response to Golder Comment 1.</p> <p>Only dredged sediment that are appropriate for in-water disposal (i.e. low leaching potential) from the Terminal 4 site will be allowed in the CDF. Future cleanup decisions will need to determine whether the CDF is an appropriate disposal option for contaminated sediment from other locations. Based on data taken as part of the Portland Harbor investigation and DEQ's upland source control work, there are areas of sediment contamination in the river that have such high concentrations and/or are highly leachable, or otherwise not safe for in-water disposal.</p>
75	3	Waste Management and other Northwest landfill operators have invested substantial money and resources into the development, permitting, construction, and operation of landfill facilities that are fully compliant with local, state, and federal environmental and regulatory requirements. Waste Management firmly believes that the disposal of contaminated sediments at lined, fully-permitted, and highly-regulated landfills is a superior environmental cleanup alternative to the	See response to Comment 75-2 , as well as Comments 1-1 , 2-3 , and 5-2 .

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75	4	<p>preferred confined disposal facility ("CDF") alternative advocated in the EE/CA Report.</p> <p>The EE/CA report has used a comparative analysis matrix that is based on unsupported and unexplained assumptions, uses an overly-simplistic ranking scheme, and – we believe – unfairly skews the conclusions toward the CDF alternative. The result would be the selection of a preferred cleanup alternative that unfairly competes against landfills that have made significant investments in fully-permitted and heavily-regulated facilities. Accordingly, Waste Management submits that the EE/CA Report's evaluation and comparison of different cleanup alternatives is flawed and should be re-done.</p>	<p>See response to Comment 75-2.</p> <p>Removal Action Alternatives, both individually and comparatively, were evaluated with respect to nine CERCLA non-time critical removal action evaluation criteria. The evaluation criteria fall into three categories: threshold criteria, balancing criteria, and modifying criteria (USEPA 1993). An alternative must meet the threshold criteria (overall protection of human health and the environmental compliance with ARARs) before it can be considered as the Preferred Alternative. The balancing criteria are effectiveness, implementability, and cost; while modifying criteria include State and community acceptance evaluated by USEPA after the public comment period. Following the individual evaluation, alternatives were comparatively evaluated using the following procedures:</p> <ul style="list-style-type: none"> • Alternative 1 (No Action) and Alternatives A, B, C, and D were compared against each other in turn for their ability to meet the individual evaluation criterion that made up the broader categories of effectiveness, implementability, and costs (i.e., balancing criteria), • For each criterion, a qualitative comparison was made between the two alternatives considered. A value of +1 was assigned to the alternative considered more favorable in terms of its relative performance at meeting the requirements of the criterion. A value of -1 was assigned to the alternative considered less favorable in terms of its relative performance, and • If the two alternatives being compared were deemed equal in their ability to meet the requirement of a criterion, both alternatives were assigned a value of zero. <p>The criterion evaluated included:</p> <ol style="list-style-type: none"> 1. Overall protection of public health and the environment, 2. Compliance with ARARs, 3. Short-term effectiveness, 4. Reduction of volume, mobility, and toxicity of contaminants through treatment, 5. Long-term effectiveness, 6. Technical feasibility, 7. Administrative feasibility, 8. Availability, and 9. Cost. <p>Specific detail regarding the comparison of each alternative against one another is discussed in Section 8.6 of the EE/CA and explains why one alternative is ranked higher than another. Table 8-2 shows the results of the comparison. EPA believes that the comparison of alternatives was completed unbiased and does not result in a preference against upland disposal. However, when considering the positive aspects of a CDF, primarily due to the proximity of the facility to Terminal 4, including less amount of handling and transport of contaminated sediments, less potential recontamination, least disruption of tenant activities, and least amount of community impacts, against off-site disposal, Alternative C was ranked the highest reflecting its greatest overall relative performance in meeting the requirements of the aforementioned evaluation criteria.</p> <p>Although upland disposal is considered a viable disposal option for future consideration, the potential impacts on the community and Port operations, primarily due to large handling and transportation impacts, as well as the location of Slip 1 as suitable for on-site disposal with the added potential to facilitate the long-term remedial action at Portland Harbor, indicated that the CDF alternative proved to be better suited for Terminal 4 sediment.</p>
75	5	<p>When a revised EE/CA report is completed, we expect that the upland disposal option will be proven to be the most environmentally protective, technically feasible, and cost-effective alternative. Our</p>	<p>Thank you for your input.</p>

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		specific comments follow.	
75	6	<p>The Comparative Analysis matrix contains unsupported and suspect assumptions.</p> <p>We have serious concerns with the use of the “Comparative Analysis” because the implicit assumptions underlying the calculations are not supported or even explained. We believe that the outcome of the Comparative Analysis itself belies its efficacy. In other words, it just does not make sense that Alternative D – dredge with landfill disposal – ranks fourth of four alternatives in the final calculations.</p> <p>For example, there is no explanation how it is decided that certain alternatives are considered to be equivalent enough to both receive “0s” and others are different enough to receive a +1 and –1. For instance, Alternative C is scored as a +1 against Alternative B’s –1 based on purportedly superior and suspect long-term effectiveness. In contrast, these two alternatives are scored as equivalent in terms of cost in spite of Alternative C costing 25% more. At what point are two alternatives different enough to warrant scores of +1 and –1? At what point are they similar enough to be scored the same? Without such guidelines, the scoring of different alternatives is susceptible to unverifiable and unstated subjective judgments.</p>	<p>The NTCRA guidance (USEPA, 1993) requires a comparative analysis of removal action alternatives to identify the advantages and disadvantages of each alternative relative to one another so that key tradeoffs that would affect the remedy selection can be identified. The guidance does not prescribe a specific method for the execution of comparative analysis of removal action alternatives. EPA used a comparative method that would highlight the benefits and disadvantages between alternatives which contain common elements. Explanations of the comparisons are provided in Section 8.6 of the EE/CA.</p> <p>The NTCRA guidance (USEPA, 1993) does not apply weightings to the three main evaluation criteria. Neither does other similar guidance documents, including the underlying RI/FS manual, or the Superfund Accelerated Cleanup Model, and ultimately the NCP does not apply weighting to the fundamental non-time critical removal action three criteria: effectiveness, implementability and cost. Thus, it is general practice and not inconsistent with the NCP and all subsequent guidance manuals, specifically the NTCRA guidance, that these three criteria are applied at equal weight.</p> <p>For each criterion, a qualitative comparison was made between the two alternatives considered. A value of +1 was assigned to the alternative considered more favorable in terms of its relative performance at meeting the requirements of the criterion. A value of -1 was assigned to the alternative considered less favorable in terms of its relative performance, and if the two alternatives being compared were deemed equal in their ability to meet the requirement of a criterion, both alternatives were assigned a value of zero. This method is consistent with methods used for other RODs and EE/CAs and is consistent with NTCRA guidance.</p> <p>Direct comparison of Alternative C with Alternative D shows how the Preferred Alternative ranks higher. For example, Alternative C is given a value of 1 over Alternative D for the criteria Overall Protection of Public Health, Short-Term Effectiveness, and Long-Term Effectiveness. Some of the reasons for the preference for Alternative C in the rankings include: 1) the amount of handling and transport of contaminated material is significantly minimized over Alternative D, 2) impact on the community is expected to be less since all construction activities associated with implementation of Alternative C is confined to the Terminal 4 facility (as opposed to transporting significant contaminated sediment off-site for Alternative D), 3) the short-term risk of recontamination is minimized during implementation because a relatively small volume of sediment is moved over the shortest distance and because the contaminated sediment will be isolated from the river, and 4) the long-term risk of recontamination is reduced because it eliminates the Slip 1 area (as opposed to Alternative D).</p> <p>Please note that because the estimated cost for each of the alternatives are within 20 percent and within the uncertainty of the cost, the comparison of cost is equal between alternatives.</p>
75	7	Also, there is no subtlety in comparing alternatives. Either two alternatives are equivalent or they are not. There is no recognition that one alternative might be only slightly better than another in one category, and substantially worse in another. It is arbitrary to use such a simplistic means of evaluating alternatives.	See response to Comment 75-6 .
75	8	Likewise, there is also no justification for the implicit decision that each of the three categories of EE/CA factors (effectiveness, implementability, and cost) are to be weighted equally in the final ranking of alternatives. That decision alone – unsupported as it is – can result in a substantial skewing of the results toward one alternative or another.	The comparative techniques for evaluating alternatives determined to be most suitable for Terminal 4 is described in Section 8.6 of the EE/CA. See response to Comment 75-6 .
75	9	The Comparative Analysis yields arbitrary and illogical results.	The comparative analysis technique is described in Section 8 of the Terminal 4 EE/CA. In this evaluation

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		<p>Any comparative analysis of different removal action alternatives is inherently a subjective exercise. While there may be some utility in adopting a quasi-quantitative approach for ranking different alternatives, mathematical manipulation should not be considered a substitute for professional judgment. In the case of this Comparative Analysis, the methodology chosen – assigning a 1, 0, or -1 to each alternative – is especially vulnerable to error because an alternative that is only marginally less protective than another will score the same as a third alternative that utterly fails to provide any environmental protection at all. Thus, for example, in this Comparative Analysis, Alternative D and the No-Action Alternative score identically for overall protectiveness when compared with Alternative C, yet it is inconceivable that an upland landfill disposal alternative would be consider no more protective than the no action alternative.</p>	<p>technique, two alternatives are compared at a time, so that it is evident, which one rates higher. This technique is applied to all pairings of alternatives to provide the least subjective method of comparing removal action alternatives.</p> <p>Consistent with the NTCRA guidance and the NCP, equal weight is applied to the three evaluation criteria of effectiveness, implementability and cost (the weight of the primary criteria was divided equally amongst the subcriteria to achieve a one-third weighting).</p>																		
75	10	<p>In deriving the final score and ranking for each alternative in the Comparative Analysis, the nine factors are given substantially different weightings, without explanation why. Those weightings are:</p> <table border="0"> <tr> <td>Overall protection</td> <td>6.7%</td> </tr> <tr> <td>Compliance with ARARs</td> <td>6.7%</td> </tr> <tr> <td>Short-term effectiveness</td> <td>6.7%</td> </tr> <tr> <td>Reduction of volume, etc.</td> <td>6.7%</td> </tr> <tr> <td>Long-term effectiveness</td> <td>6.7%</td> </tr> <tr> <td>Technical feasibility</td> <td>11.1%</td> </tr> <tr> <td>Administrative feasibility</td> <td>11.1%</td> </tr> <tr> <td>Availability</td> <td>11.1%</td> </tr> <tr> <td>Cost</td> <td>33.3%</td> </tr> </table> <p>This weighting scheme can cause significant distortions in the final rankings of alternatives, yet without any explanation why. For example, cost is given five times greater weight than overall protection, yet without explanation</p>	Overall protection	6.7%	Compliance with ARARs	6.7%	Short-term effectiveness	6.7%	Reduction of volume, etc.	6.7%	Long-term effectiveness	6.7%	Technical feasibility	11.1%	Administrative feasibility	11.1%	Availability	11.1%	Cost	33.3%	<p>Please see response to Comments 75-6 and 75-9.</p>
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Cost	33.3%																				
75	11	<p>Upland disposal of contaminated sediments is generally considered to be more environmentally protective overall than in-water or CDF disposal options.</p> <p>Landfill owners have invested millions of dollars and years of work in designing, permitting, constructing and operating RCRA Subtitle D-compliant landfills. Modern landfills have state-of-the-art liners, sophisticated leachate collection and stormwater runoff systems, extensive groundwater and air emissions monitoring systems, significant financial assurance requirements, full-time professional staff, and extensive regulatory oversight. Moreover, a number of landfills in the region have significant geological, geographic, and</p>	<p>The Terminal 4 alternatives were evaluated on site and project specific conditions and parameters.</p> <p>Also see response to Golder Comment 1 describing the fundamental differences between CDFs intended for the placement of contaminated sediment (with their unique chemical physical characteristics) and upland landfills which are intended for a completely different set of conditions, waste streams and chemical, physical conditions.</p>																		

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75	12	<p>climatic advantages over a CDF constructed in Portland Harbor.</p> <p>We strongly disagree with the EE/CA's conclusion that the CDF disposal option is viewed as more environmentally protective overall than landfill disposal. It is not credible to suggest that the in-water, unlined CDF option has greater overall protectiveness than modern landfills. Not only is the setting of the CDF (in-water) inferior to disposal in arid, upland landfills, the CDF lacks the important engineering and environmental controls associated with modern landfills.</p> <p>Notwithstanding the clear benefits of landfill disposal, the EE/CA concludes that of the four alternatives the landfill disposal alternative has the least overall protectiveness. This is not a credible conclusion.</p>	<p>Please see response to Golder Comment and Comment 75-4 and 75-11.</p>
75	13	<p>Landfill disposal of contaminated sediments should rank higher for long-term effectiveness than CDF disposal.</p> <p>For the same reasons given above, we strongly question the conclusion that CDF disposal of contaminated sediments in an unlined, in-water CDF is considered to rank higher in terms of long-term effectiveness than a disposal option that includes a fully-permitted, lined, Subtitle D-compliant landfill. Modern landfills are designed to meet the strict regulatory requirements of Subtitle D in order to ensure long-term effectiveness. A CDF option that does not meet these same regulatory requirements would logically have less long-term effectiveness.</p>	<p>See response to Comment 75-11 above and response to Golder Comment 1. Please see response to Comment 74-2 for long-term effectiveness evaluation.</p>
75	14	<p>Landfill disposal is readily available.</p> <p>The Comparative Analysis also concludes that Alternative D is least favorable based on availability because "it relies most heavily on the availability and coordination of personnel, equipment, materials, transportation modes, and off-site TSD facilities." This rationale does not make sense. While off-site transportation and disposal obviously will require coordination, means of transport, and facilities for disposal, there is no basis to conclude that these elements are unavailable or less available than the resources required for the CDF alternative.</p>	<p>The EE/CA, in Section 8 and Appendix Q, correctly states that the CDF alternative relies less on outside resources such as hauling, transport and disposal. The permit to two Northwest landfills to accept "wet" waste is temporary and has certain volume/tonnage acceptance land time limits. These limits represent some constraints which impact the availability of landfill disposal.</p> <p>Since there are a number of other contaminated sediment projects in the Northwest which may utilize these landfills, it has to be taken into account whether and if these projects would occur at the same time as the Terminal 4 removal action representing an availability concern for hauling, transport and disposal.</p> <p>Further, haul capacity is also impacted by other, non-contaminated sediment management related issues, for example major land development, dam construction, highway construction and other projects which may tie up available transport capacity impacting the availability and cost of such services. Each additional step in a process adds complexity and opens up the potential for delays.</p> <p>See Section 8, Appendix B, Appendix J, and Appendix Q - Section Q-5 for more detailed information regarding availability and feasibility.</p>
75	15	<p>CDF disposal does not satisfy ARARs.</p> <p>Under Oregon regulations, contaminated sediments from a Superfund cleanup are considered "cleanup materials contaminated with hazardous substances." OAR 340-093-0030(14); OAR 340-093-0170. If disposal is determined to be the appropriate management strategy, then Oregon regulations and CERCLA require disposal at a landfill that meets the substantive design requirements of 40 CFR</p>	<p>See response to Golder Comment 1. The federal solid waste landfill regulations are not applicable or relevant and appropriate requirements for the Terminal 4 removal action.</p> <p>The applicability of OAR 340-093-0170 "Cleanup Materials Contaminated with Hazardous Substances" is dependant on the definition of "site". OAR 340-093-0170 (1)(b) states that OAR 340-093-0170 does not apply if the materials containing the hazardous substances are not moved from the "site of contamination". Considering the definition as cited in the EE/CA report of "onsite" as "the aerial extent of contamination and all suitable areas in very close proximity to the contaminates necessary for implementation of the response</p>

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		<p>Part 258, Subpart D or an approved alternate design that satisfies specific performance criteria. OAR 340-093-0170(3)(a). While the EE/CA asserts that CDF disposal will comply with ARARs, it does not explain how, especially given that the CDF is an unlined facility that obviously does not meet the Part 258 standards or the alternate performance criteria.</p> <p>Likewise, we also question the conclusion in the Comparative Analysis that CDF disposal is considered equivalent to landfill disposal in terms of ARARs compliance. If the CDF neither meets the requirements of 40 CFR Part 258 nor the alternate performance criteria, then it does not meet ARARs and cannot be considered equivalent to Alternative D in terms of ARARs compliance. It is also not explained how the CDF disposal option will meet other ARARs, such as ARARs based on Section 404 permit requirements of the Corps of Engineers or Clean Water Act water quality standards. Instead, the EE/CA simply presumes that CDF disposal will – and must – comply with all ARARs. Thus, based on this untested and unsupported assumption, the EE/CA report scores the CDF option (with questionable ARARs compliance) as equivalent to an upland disposal option that would easily achieve ARARs compliance.</p>	<p>action” the proposed CDF is within the boundary of the Terminal 4 site thus, OAR 340-093-0170 would not apply. Therefore, under that Oregon regulation, the dredge sediment would not be required to be disposed of in a facility meeting the design requirements of 40 CFR 258.</p> <p>The Oregon Department of Environmental Quality (“DEQ”) evaluated the question of state solid waste regulations as applicable or relevant and appropriate requirements for the CDF. DEQ concluded that certain portions of the state solid waste regulations are relevant and the proposed removal action already incorporates many of them. In addition, DEQ concluded that certain portions of other relevant state solid waste regulations will be imposed on the Terminal 4 Removal Action during design and implementation, such as:</p> <ul style="list-style-type: none"> • Construction Certification • Operation Plan • Monitoring Discharge to the River • Closure Plan • Site Monitoring • Develop Financial Assurance <p>Therefore, since the potentially relevant and appropriate state solid waste regulations are not more stringent than federal law requirements, state solid waste regulations are not considered ARARs for the Terminal 4 CDF.</p> <p>In summary, 40 CFR Part 258 does not include applicable or relevant and appropriate requirements for the CDF. The CDF will be designed and constructed to meet the substantive requirements of the CWA, which is the governing ARAR for the discharge of dredged material to navigable waters of the United States.</p> <p>Section 6 of the EE/CA contained a list of the potential ARARs for the removal action that included a description of the requirement and generally when it would relate to the removal action. A final ARARs list is attached to the Action Memo.</p> <p>The EE/CA also contained additional information relating to a few of the more significant ARARs. Permit requirements contained in Section 404 of the Clean Water Act are not ARARs for the Terminal 4 removal action because they are procedural and CERCLA response actions taken on-site are exempt from permit requirements of federal, state, or local law. See 42 USC Section 9621(e). The substantive requirements of Section 404, namely Section 404(b)(1) and its implementing regulations, are ARARs. The Port prepared a preliminary Section 404(b)(1) analysis on the preferred alternative, attached as Appendix Q to the EE/CA. The 404(b)(1) requirements will be further incorporated into the Terminal 4 action as the design phase of the project proceeds, including adequate mitigation necessary to offset unavoidable loss of habitat from the removal action. Another ARAR for this action is the Endangered Species Act. The Port also prepared an initial Biological Assessment on the preferred alternative, Appendix P to the EE/CA and consultation has been initiated with the appropriate resource agencies. Further ESA analysis and consultation deemed necessary will proceed throughout the design and implementation of the removal action. A certification equivalent to the substantive requirements of Section 401 of the Clean Water Act will be undertaken to evaluate what conditions, measures and monitoring will be required to reasonably assure that water quality standards will be met throughout the implementation of the removal action. It is not speculative to assert that ARARs will be complied with to the extent practicable; as such requirements become operating standards for the project consistent with CERCLA and the NCP. Additionally, other dredge and fill projects of contaminated sediment have been conducted under CERCLA authorities and compliance with the typical ARARs for such actions has been met at those projects.</p>

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75	16	<p>The Comparative Analysis should not include credit for excess disposal capacity in its cost comparison.</p> <p>We also disagree with the assertion that the cost of the CDF should be reduced based on the anticipated revenues to be collected for the disposal of other contaminated sediments from nearby cleanups. The EE/CA should not be viewed as an opportunity to develop additional unpermitted disposal capacity without undertaking the extensive and lengthy regulatory evaluation with numerous opportunities for public comment that Subtitle D landfill owners and operators are required to pursue. It is fundamentally unfair to circumvent the extensive regulatory review process for and the huge investment of money and resources into the development and operation of Subtitle D landfills. To do so would only further exacerbate the inequitable competitive advantage given to a CDF disposal over Subtitle D landfills.</p> <p>Furthermore, the assumed \$10 million cost benefit assumption is flawed in that the anticipated volume which is needed is neither yet defined (RI/FS not completed) or committed to the Terminal 4 CDF. EPA should not assume that such volumes exists, and even if it does, that third parties involved in other cleanups will be willing to send material to the CDF due to environmental liability or financial issues. This assumption also presents a significant financial risk to the tax-paying public if this assumption proves incorrect.</p>	<p>NCP guidance requires EPA to evaluate the overall cost of alternatives, including any savings or other cost offsets a PRP may create to reduce the overall cost of a removal action.</p> <p>Construction of a CDF as part of the Terminal 4 removal action comes with no obligation or guarantee to use the facility as a disposal site for contaminated sediments from other dredging projects in the Portland Harbor Superfund Site. However, an existing CDF will create an on-site sediment disposal option for consideration if the project involves suitable dredged material for in-water disposal.</p> <p>CERCLA provides and allows for the substantive compliance but not procedural compliance with otherwise applicable federal and state laws that may otherwise apply to a project undertaken under another statute or authority. The CERCLA statutory scheme was determined by Congress to be necessary and appropriate in order to effectuate the remedial purpose of the statute and minimize delays in implementing cleanups. Nonetheless, as discussed above, Subtitle D regulatory requirements would not be applicable to siting, designing, or constructing the CDF.</p> <p>Appendix Q provides more detailed analysis of the needs of the Portland Harbor Superfund Site as it relates to the CDF's excess capacity. This evaluation of future needs of the Superfund Site in the context of the removal action alternatives evaluation is consistent with NTCRA Guidance (EPA 1993 at 41) and Section 104(a)(2) of CERCLA.</p>
75	17	<p>Based on the above, Waste Management obviously is very concerned with how the EE/CA Report has compared different cleanup alternatives. In particular, we are very concerned with how the upland landfill disposal option has been evaluated. We know that you will consider these comments carefully and look forward to your response.</p>	<p>Thank you for your input. See above responses for comparison of alternatives, include upland disposal. It should be noted that the selection of the CDF does not bias EPA's future decisions. Although the CDF may be an additional disposal option to consider in future cleanup decisions, whether or not the CDF will be determined to be appropriate for the sediment being dredged and/or a protective alternative will need to be evaluated and a decision related to that cleanup will be made. Having an on-site disposal facility may generate more interest by other facility owners to address contamination at their sites sooner, if they believe that the CDF may be more efficient, implementable or cost-effective. However, EPA's review of such a proposal will need to consider the protectiveness of disposal in the CDF compared to other cleanup approaches or disposal options.</p>
76	1	<p>As recommended by our board and ratified by a vote of our general membership, FOCP advocates clean-up of Terminal 4 using Alternative D (Dredging Emphasis with Upland Landfill Disposal). However, our recommendation is contingent on two further requirements:</p>	<p>Thank you for expressing your preference. EPA has selected Alternative C due to a number of evaluation criteria. Please see responses to Comments 1-1, 2-3, and 75-4. Based on the multiple comments like yours, EPA thoroughly reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments.</p>
76	2	<p>FOCP advocates hydraulic dredging as the removal technology for extracting sediments from the indicated slips.</p>	<p>Hydraulic dredging is an attractive option for collecting and transporting contaminated sediments from Slip 1 into the CDF and will be considered during the design of the Removal Action.</p>
76	3	<p>FOCP advocates the transfer of dredged material directly to rail-based transport for final removal from the terminal area.</p>	<p>Please see response to Comment 1-1.</p>
76	4	<p>In recommending landfill disposal, our association gives greatest weight to this standard: which of the alternatives will provide the most complete and permanent solution to the problem of durable toxic sediments located in an urban area with a growing population? While each of the options presented by the Port promises to contain the lingering toxic sediments, Alternative D comes closest to the ideal outcome of permanently removing the waste from a densely populated urban environment such as N. Portland.</p>	<p>Please see response to Comment 1-1.</p>

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76	5	The option recommended by the Port's engineering consultants (Alternative C, Dredging Emphasis with Confined Disposal Facility) provides cost benefits to the Port and minimizes some kinds of risks, but it does not provide a high enough guarantee of long-term protection from such threats as water-table contamination and earthquake damage, especially in the context of an Early Action recommendation.	Please see the responses to Comment 2-6 and the Golder Comments .
76	6	If adopted, its implementation will leave residents of N. Portland with lingering doubts about ultimate safety and integrity of the CDF for decades to come. Meanwhile, the successful completion of Alternative D (with FOCP's proposed revisions) provides a long-term solution that will not require second-guessing by future generations of Portland residents.	Because many people in north Portland live in close proximity to the proposed CDF, it is very important for EPA to make sure that your concerns about the long term safety and integrity of this facility are adequately addressed. Please see the response to Comment 1-1 and 74-2 .
77	1	I am writing this letter in opposition of building a Contained Disposal Facility in the Port of Portland's marine terminal 4 on the Willamette River.	EPA has noted your preference. Under the proposed alternative, uncontrolled pollution that poses a risk to human health and the environment is placed into a well designed disposal facility that will protect people and wildlife.
77	2	I believe this plan is far too risky and will not resolve the contamination issues at all, but only serve to further complicate them. The proposed Confined Disposal Facility lies between two earthquake faults and on a flood plain that has actually flooded three times in the last 60 years.	Because of the high levels of concern expressed by the community over how a CDF would withstand earthquake, flood and other catastrophic event, EPA has carefully reviewed the EE/CA to see if these concerns were adequately addressed. The CDF as proposed would withstand a catastrophic flood or earthquake with little likelihood of a release of contamination. Please see the responses to Comment 2-6 , Comment 2-8 and the Golder comments .
77	3	The CDF is too close to housing and business near the harbor. If either of the above mentioned natural hazards [earthquake or flood] were to occur the contamination would pose serious health risks to the neighborhood.	Please see response to Comment 2-2 .
77	4	On top of these serious concerns we have to add the terrible and on-going history criminal malfeasance of the Port of Portland in managing their waste issues. The Port is not a waste management facility. How can we trust them to manage this project for the next 500 years?	EPA, several state agencies, tribes and natural resource trustees provide oversight for cleanup projects to make sure that the proposed actions are properly designed, implemented and monitored. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup and the Port of Portland is responsible for the cost of evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs. As a requirement of the legal agreement EPA has with the Port, the Port must provide financial assurances to prove that it can meet its cleanup obligations.
77	5	The waste should be shipped away from the concentration of people here in Portland and stored in a licensed landfill for saner and safer long-term solution.	EPA has noted your preference for off-site disposal. Please see response to Comment 1-1 .
78	1	I am writing to express my concern over the proposed method of dealing with the Portland Harbor Superfund Site. I applaud the fact that the government wants the site cleaned up, but feel it is imperative for the safety of future generations and us that the cleanup is done correctly. I have been a citizen of Portland for ten and half years, and one of the reasons I chose to make Portland home was the beautiful river running through our city. Our state, and especially the city of Portland, is known for its progressive thinking and environmental consciousness. As a City Planner, I know we have one of the most livable metropolitan areas in the United States. It is sad that we have a toxic superfund site located in the heart of the city.	EPA entered an early action agreement with the Port of Portland because we agree that the river should be cleaned up without delay. EPA feels the cleanup of Terminal 4 and Portland Harbor is an extremely high priority and we are committing staff and resources to this project until the cleanup is done.
78	2	I believe that dredging the toxic waste, placing it in a capped Slip, and leaving in the river is not the best manner of dealing with the issue.	Please see response to Comment 1-1 .
78	3	The Confined Disposal Facility (CDF) is just too dangerous to our community.	EPA included a CDF in the EE/CA alternatives because it is a safe and protective method for disposing of contaminated sediments.

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78	4	It is true that CDF may be a less expensive in the short term to contain the waste, but the cost to our communities, our children and the health of the Willamette River in the event of containment failure is too high.	The CDF alternative was not significantly cheaper than other alternatives evaluated. See response to Comment 2-2 and 2-3 .
78	5	My main concern is what might happen in the event of a flood, or earthquake, both of which are likely events to occur in our area. I was in Portland during the major Willamette River floods in the winter of 1996. We all know the history of our area and the likelihood of a major earthquake. I am concerned about the failure of the CDF when such events occur in the future.	Because of the high levels of concern expressed by the community over how a CDF would withstand earthquake, flood and other catastrophic event, EPA carefully reviewed the EE/CA to see if these concerns were adequately addressed. The CDF as proposed would withstand a catastrophic flood or earthquake with little likelihood of a release of contamination. Please see the response to Comment 2-6 , Comment 2-8 and the Golder Comments .
78	6	As a member of the Sierra Club, I have been working on issues involving the clean up of the Willamette River. I am gravely concerned that the CDF proposal will not improve the river quality in the long term and will only result in even more money being spent. I would like to see us be leaders in the cleanup of our Superfund Site and do the job right the first time.	Please see the response to Comment 1-1 . EPA has carefully reviewed the EE/CAs analysis. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments.
79	1	I am dismayed to learn of the Port of Portland's inadequate plans to clean up toxic pollution in the Willamette Harbor. Specifically, I am writing concerning the plan to build a containment area for toxic waste along the river rather than removing the waste.	Sediment disposed in the CDF is not a hazardous waste. Please see response to Comment 1-1 .
79	2	The fact that the area was designated a "Superfund Site" indicates that the pollution in the harbor is no small matter and it would just continue the tragedy to fail to address the issue fully when we now have the chance.	The Terminal 4 Early Action cleanup is part of the overall effort to clean up the Willamette River. Other local, state and federal agencies have and will continue to undertake additional efforts to ensure the Willamette River is clean for future generations.
79	3	The toxic waste in the harbor should be removed to a site where it will be safe for future generations.	Please see response to Comment 1-1 .
79	4	Building a "Confined Disposal Facility" next to the river seems ludicrous. It is easy to imagine toxins leaching out, runoff and flooding disturbing the containment, earthquakes, or other failures which would simply require the process to be started again, at substantial cost to both the environment and taxpayers.	Please see responses to Comments 2-6 and 2-8 for earthquake and flooding issues and Comments 2-3 and 5-2 for long-term safety and leaching issues.
79	5	You have the opportunity and technology to actually clean the harbor and the waste should be removed from the river area, probably to Arlington where it can be effectively dealt with.	Please see response to Comment 1-1 .
79	6	Dumping the dredgings into a hole beside the Willamette may be a less expensive solution at the moment, but it is not the right one. Please let the long term health of the environment and Portlanders guide you foremost, not money.	Placing selected low-level sediment in a carefully designed CDF is not the same as dumping it in a hole. Please see response to Comments 1-1 , 2-3 , and 5-2 .
79	7	We have the opportunity to once again clean a bit of the Willamette, but we must do it in a manner which will actually solve the problem and not leave it to future generations to deal with again.	Please see response to Comment 1-1 .
79	8	My father served as a Port of Portland Commissioner many years ago in my youth. At the time I did not really know much about what he did in that capacity, but his service to the community made me proud. I'm sure he would be ashamed to find the Port dealing with this issue so inadequately today.	Thank you for your input.
80	1	I am writing this letter to bring to voice my concern regarding the Engineering Evaluation and Cost assessment (EE/CA) for the Port of	EPA has noted your preference. Please see the response to Comment 1-1 .

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		<p>Portland's proposed early action at Terminal Four and the possibility of building a Confined Disposal Facility at Terminal 4.</p> <p>As a concerned citizen of Portland and an environmentally conscious member of the Sierra Club, I was appalled to learn about the lack of insight that led to the Port of Portland deciding on building a "Confined Disposal Facility" (CDF) out of Terminal Four, Slip 1, when other environmentally friendly alternatives were available. The ports decision to build a slip, which would be blocked by a berm made of earth and gravel, and covered with gravel will not solve the problem of cleaning up the Superfund site, rather all it does is leave the dangers for our future generations to face.</p>	
80	2	<p>Building such a structure also has numerous other risks which the port of Portland has failed to recognize. These include but are not limited to:</p> <ul style="list-style-type: none"> i) Earthquake risk ii) Waste management arising out of an Earthquake iii) Flood risk 	Please see response to Comments 2-6 and 2-8 .
80	3	The port should seek alternative technologies that could be used for the project. These include Dredge Emphasis and Landfill Disposal (off-site) and CAP emphasis.	Please see response to Comment 74-9 .
80	4	I have been residing in Portland for the last Four years and I moved to this city due to its environmentally friendly neighborhoods and city policies. Actions like those taken by the Port of Portland will deter future residents who wish to make this great city their home.	Please see response to Comment 2-2 .
81	1	I am writing to express my concern over the proposed method of dealing with the Portland Harbor Superfund Site. I applaud the fact that the government wants the site cleaned up, but feel it is imperative for the safety of ourselves and future generations that the cleanup be done correctly. Our state, and especially the city of Portland, is known for its progressive thinking and environmental consciousness. We have one of the most livable metropolitan areas in the United States. I find it embarrassing as an Oregonian that we had a Superfund cleanup site in the first place, let alone the proposed method of dealing with this hazardous material.	Thank you for your input. Please see response to Comment 1-1 .
81	2	The Confined Disposal Facility (CDF) is just too dangerous to our community.	Because of the high levels of concern expressed by the community over how a CDF would withstand earthquake, flood and other catastrophic event, EPA carefully reviewed the EE/CA to see if these concerns were adequately addressed. The CDF as proposed would withstand a catastrophic flood or earthquake with little likelihood of a release of contamination. Please see response to Comments 2-6 and 2-8 .
81	3	It is true that it is a cheap and easy way of dealing with the waste, but the cost to our communities, our children and the health of the Willamette River in the event of containment failure is too high.	Thank you for your input. The importance of protecting people and wildlife from exposure to uncontrolled contamination in Terminal 4 was the reason for undertaking this early action
81	4	My main concern is what might happen in the event of a flood or earthquake, both of which are likely events to occur in our area. As a resident of Oregon City, I saw first hand the ravages of the flood of 1996. I could see a scenario where the integrity of the containment area could be easily compromised. We all know the history of our area and the likelihood of a major earthquake. I am concerned about the failure of the CDF in such an event.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Based of multiple comments like yours, EPA reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments and is a permanent solution to eliminate potential exposure to human health and the environment.

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81	5	As a member of the Sierra Club, I have been working on issues involving the clean up of the Willamette River. I am gravely concerned that the CDF proposal will not improve the river quality in the long term and will only result in even more money being spent. I would like to see us be leaders in the cleanup of our Superfund Site and do the job right in the first place. As a mother of two, I believe my children deserve this consideration.	Please see the response to Comment 1-1 .
82	1	We are concerned that the EC/CA proposes more than simply a cleanup of sediment contamination; instead, it attempts to pass the cost of dredging sediments from Slip 3 to depths necessary to accommodate shipping to the potentially responsible parties (PRP's) rather than simply focusing on the dredging of volumes of impacted sediments necessary to address identified ecologic and human health risks.	Depth required for shipping traffic in Slip 3 was not a driving factor in selecting the dredge depth. In general, dredging depth was selected using available literature data, including TECs and PECs, and comparing them to coring data collected at the site. The overall consideration for estimating the dredge volume included evaluation of criteria that are explicitly identified in EPA's NTCRA guidance: (1) evaluation of risk at a level appropriate for a Removal Action, (2) considerations related to implementability and long-term effectiveness and, (3) cost-effectiveness. The ongoing use of Slip 3 was considered, but only in regards to selection of a feasible removal action (i.e. applicability of capping or dredging a particular area).
82	2	Our concerns are focused upon the tailored utilization by the Port of the McDonald Consensus Threshold Effects Concentrations ("TEC") to establish overly conservative cleanup levels which would drive the dredging of sediments to deeper depths and would generate sediment volumes for disposal which far exceed the volumes that would be generated if actual sediment data was utilized to evaluate and eliminate Chemicals of Interest ("COI") that do not present an elevated risk or which represent background conditions in the area. The EE/CA proposes to dredge 105,000 cubic yards of impacted sediments from Slip 3. Our preliminary estimate is that if appropriate risk criterion was employed in evaluating the risk associated with identified COI's present in the Slip 3 area, at most a volume of 38,590 cubic yards of sediments would need to be dredged, which corresponds to 37% of the volume estimated by the Port. The ECA approach effectively attempts to pass the cost of dredging the Terminal 4, Slip 3 to depths sufficient to accommodate vessel berthing to others (PRP's) under the guise of effecting a cleanup action to address demonstrable environmental and human health risk.	See response to Comment 82-1 above. The Port of Portland has taken responsibility for all cleanup costs for the Terminal 4 project. Under the Superfund laws, Potentially Responsible Parties pay the cost of cleanup. The Port of Portland is paying for the evaluation and cleanup of contamination at Terminal 4, including EPA oversight costs. Although not the prime objective, the Port of Portland maintains the right to do maintenance work on their slip in a simultaneous cleanup operation. In estimating the proposed dredge volume, TEC and PEC values were considered. TEC is a low effects guideline that represents concentrations below which toxicity effects are unlikely to be observed in freshwater benthic invertebrates. The PEC is a probable effects guideline that represents concentrations above which toxicity effects are likely to be observed in freshwater benthic invertebrates. The use of TEC and PEC values is appropriate for removal actions in Portland Harbor because no site-specific risk-based sediment cleanup levels have been established at this time. Until the baseline risk assessment and CERCLA remedial decisions are made, site-specific risk-based sediment cleanup values will not be determined. To the Port's credit, it wanted to address a contaminated area in the Harbor early and is willing to use nationally-accepted literature values to determine a protective cleanup, rather than wait for site-specific risk values. The data at Terminal 4 clearly established that there were risks to human health and the environment from the uncontrolled contamination at the facility that required action. The Terminal 4 cleanup will be re-evaluated when the Portland Harbor Superfund Site cleanup standards are established to assure that the cleanup is protective. The Port's use of TEC and PEC values to define the cleanup goals of this action may save the Port needless additional costs to remobilize to take additional action that the final cleanup plan may have required if less-conservative values were applied.
82	3	The ECA is not being driven by any demonstrable risk or time considerations identified by the Port. Further, risk drivers for the Portland Harbor Superfund Site have not yet been determined	See response to Comment 82-2 above.
82	4	The approval of the ECA could essentially remove Terminal 4 from the Portland Harbor Superfund Site and the jurisdiction of the ultimate actions required by the eventual Record of Decision for the Site rendered after appropriate consideration of all of the risks presented by the COI's in the area. The implementation of conservative screening levels as de facto cleanup levels under the ECA are proposed simply to achieve the Port's commercial interests.	See response to Comment 82-2 above.
82	5	The EE/CA is not sufficiently rigorous in its consideration of ecologic risk presented by the COI's present in the Terminal 4 area, and other alternatives to the cleanup of the Terminal 4 area should be	See response to Comment 82-1 above.

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		considered. For the reasons stated above, the ECA clearly does not comply with the requirements of the National Contingency Plan and should not be approved by USEPA.	
83	1	I own a home in Linnton and grew up in Portland. The health and future of my community is very important to my family and me. I have a 5-week-old baby who I hope will grow up in this neighborhood and thrive. I do not wish to fear the river water or air we breathe. I want to feel confident that not only my child, but also all the people who live in or visit our neighborhood, can enjoy the Willamette River without worrying about the toxics in it. I know that we have the capacity to make our environment safer than it is, and that some choices require greater resources, commitment, and time to accomplish.	Please see the response to Comment 2-2 and Comment 12-1 .
83	2	For these reasons, I wish to endorse Alternative D of the recommendations offered. I acknowledge that this is the costliest of the alternatives offered, however, in weighing the benefits of having this stretch of the Willamette truly cleaned up over the long term, the costs must be considered an investment in a cleaner future	Thank you for your input. Thank you for expressing your preference. All alternatives in the EE/CA will protect human health and the environment and they were evaluated using established criteria of effectiveness, implementability, community acceptance and cost. Please see response to Comment 1-1 .
83	3	I have significant concerns about the other three alternatives. Specifically, Alternative C, to create a confined disposal facility in slip 1, concerns me as an expedient solution, but not the most permanent solution.	CDFs and other in-water confined disposal facilities have been successfully used in the Northwest. Based on available information, all CDFs in the Pacific Northwest function as intended.
83	4	I understand that this method of CDF has worked for other sites in our region, however, the possibility of significant flooding (such as the 1996 flood) and earthquakes have not been acknowledged to my satisfaction for this part of the Willamette. The recent results of Hurricane Katrina are a powerful reminder of how nature's "anomalies" do indeed happen and end, quite literally, in disaster. If the goal is to clean up this part of the Willamette, the only real solution from my perspective is Alternative D. Alternative C would merely contain the toxics in one area which could be prone to breach from natural (or human) causes.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives. Please see the response to Comments 2-6 and 2-8 .
83	5	It is the responsibility of the businesses that created this situation to pitch in and clean up our collective environment. I understand a number of corporations have spent significant resources on studies to clean up the various toxics. Studies however, are not solutions. It is now time for these same parties to join with the government to fund a permanent solution to the mess. The best solution is Alternative D and I ask that the EPA follow through on this recommendation.	Thank you for expressing your preference. All alternatives in the EE/CA will protect human health and the environment and they were evaluated using established criteria of effectiveness, implementability, community acceptance and cost. The Port of Portland is paying for the investigation and cleanup of terminal 4, including EPA oversight costs. Please see the response to Comment 1-1 for a summary of why EPA selected Alternative C.
84	1	The evaluation of liquefaction during seismic events is insufficient for the confined disposal facility (CDF) proposed in Alternative C. As stated in Section 2.3.5.1 of Attachment A, the EE/CA "ignored the potential for liquefaction of the CDF berm, the hydraulic soils placed behind the berm and the soils adjoining the berm." Additional technical analysis by Golder concludes in Section 2.3.5.3 that "liquefaction of the CDF berm, alluvial soils or soil abutments (or some combination thereof) will likely lead to the catastrophic failure of the berm." In Section 2.3.6, Golder recommends construction of the CDF berm in a manner that can minimize the liquefaction potential", and improvement of the existing fill soils at the abutments of the berm and the alluvial soils at the base of the berm to reduce the	Please see responses to Golder Comments 2, 3, 5, and 6 .

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		potential for liquefaction resulting in loss of containment of the CDF. The EE/CA should be reevaluated to consider the engineering feasibility as well as cost analysis for these recommendations.	
84	2	In addition to seismic concerns regarding liquefaction, Section 2.1 of Attachment A notes that “the level of seismic analysis and design required for land-based disposal is significantly higher than has been undertaken for the (EE/CA). If the proposed CDF was regarded as a landfill, then Federal and Oregon state regulations will require that detailed studies of active faults must be undertaken within 3000 feet of the CDF site; and the CDF must not be located closer than 200 feet of an active fault...” As discussed in Sections 2.2.1, 2.2.2 and 2.24, and shown in Figure 2.2 of Attachment A, the Portland Hills and East Bank faults have a high probability of being active and may be located underneath or within 200 feet of Terminal 4. The locations of these two faults and their traces as well as applicability of Federal and State land-based disposal requirements should be determined prior to the selection of Alternative C as an early action.	See responses to Golder Comment s 1, 2, and 3.
84	3	Section 3.4.2.3 of Attachment A describes four erosion scenarios for the CDF proposed in Alternative C that could cause loss of containment and/or failure of the berm. Of particular concern, is the potential for erosion from river flows during flood events along the toe of the berm structure at the bottom of the channel (particularly when combined with a seismic event that causes failure of the toe of the berm). Golder notes that the CDF “conceptual design section does not show any armoring or erosion mitigation designs for the toe of the berm along the river side of the structure or at the back-slope side of the berm,” and furthermore states that “the cost estimate focuses on propeller erosion instead of river flow erosion, does not provide enough clarification of bank erosion protection as a defined design element, and does not include any provision for toe erosion along the river side of the berm resulting from peak flows and/or seismic failure in the area of the toe of the berm.” The potential for erosion of alluvial soils beneath the berm during peak flows should be evaluated prior to the selection of the CDF as a preferred alternative for early action and the EE/CA cost analysis should reflect this evaluation.	<p>Potential short-term impacts of flooding and overtopping the berm during construction will be addressed by specifying construction techniques and by staging of the CDF berm construction. These details will be evaluated during final CDF design. A variety of modeling and historical information was evaluated to assess the potential for flooding impacts on the CDF. As shown below, the CDF can be designed to mitigate potential short-term impacts of flooding and overtopping during construction.</p> <p>The HEC-RAS modeling analyses results presented in Attachment K-1 indicate that the CDF will have no measurable impact on the 100-year flood elevations within the Willamette River. Since the final ground elevation for the proposed CDF design is higher than the FEMA predicted 500-year flood elevation of 31.5 feet NGVD, inundation of the proposed CDF by floodwaters is not anticipated at a higher frequency recurrence interval (e.g., an event less than a 500-year recurrence).</p> <p>Verification of predicted flood elevations is further demonstrated by the February 1996 aerial photograph which was taken at or near the peak flood elevations. This event approximated a 100-year recurrence interval. Provided as Attachment B, the aerial photograph of the Terminal 4 area on February 9, 1996 shows most of the Terminal 4 upland areas dry and not impacted by floodwaters, particularly in the proposed CDF area immediately around Slip 1. The upstream section of the terminal reflects some inundation or ponding adjacent to the bankline, which approximates the 100-year floodplain boundary as shown on the FEMA FIRM Map 4101830060E. However, at the head of Slip 1, the floodwaters do not appear to extend to the top of the banks in the aerial photograph (Attachment B).</p> <p>The February 1996 Postflood Report Hydrometeorological Evaluation prepared by the U.S. Army Corps of Engineers (September 1997) indicates that the peak Willamette River flood elevation at the Morrison gage in Portland was 28.6 feet NGVD. Based on the FEMA Flood Insurance Study, the 100-year flood elevation for the Willamette River at the Morrison Bridge is 28.6 feet NGVD, indicating that the Willamette River experienced a peak matching the predicted 100-year flood event in February 1996 in Portland.</p> <p>The aerial photograph, FEMA flood maps and the recorded flood peak at the Morrison Bridge suggest that the flood peak at Terminal 4 reached around 27.5 feet NGVD, which approximates a 100-year flood elevation on the Willamette River. As the aerial photographs demonstrate that the Slip 1 upland area was not inundated during a low frequency return interval, i.e. 100-years, the potential for the site</p>

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			<p>to flood on a more frequent basis is not expected.</p> <p>Concern regarding the high velocity Willamette River flows was noted. For reference, the average channel velocity predicted in the FEMA Flood Insurance Study for the City of Portland is estimated at 3.2 to 3.4 feet per second at Terminal 4. While some sections of the channel may experience velocities faster and slower than the average, velocities above the average are typically located in the deeper mid-channel sections and not along the banks.</p> <p>Also, water velocities predicted for other locations of the Willamette River, such as the Morrison Bridge, are not directly comparable to the proposed CDF site because the Willamette River channel widths and depths vary with location with wider and deeper channel sections having relatively lower velocities and vice versa.</p>
84	4	<p>As noted in Section 3.5 of Attachment A, the Willamette River has experienced numerous large recent flood events that can "produce water elevations and velocities that have the potential for inundating the proposed T4 area, causing erosion damage to the river banks, and mobilizing channel bottom sediments." In contrast to the low-velocity Columbia River backwater flooding characterized by the Port of Portland at the PHCAG meeting, large high-velocity flood events along the Willamette River occurred in December 1964 and February 1996 as the result of intense rainfall and snowmelt west of the Cascade Divide despite flood control operations to the maximum extent possible by the United States Army Corps of Engineers (US Army Corps) in the Willamette River Basin. These two floods are characterized in Section 3.3.2 of Attachment A; The Pacific Northwest Floods of February 6-11, 1996, Proceedings of the Pacific Northwest Water Issues Conference, Portland, Oregon, October 7-8, 1997, American Institute of Hydrology, 1997; and February 1996 Post flood Report Hydrometeorological Evaluation, US Army Corps of Engineers, September 1997. These reports indicate that inundation of the proposed CDF location may occur at a high frequency recurrence interval for the preferred Alternative C in the EE/CA. Visual representation of the 1996 Willamette River flood is provided in the US Army Corps aerial photograph of the Terminal 4 area on February 9, 1996 (Attachment B), one day after the peak flow. Additional photos of this flood are available in the February 1996 Postflood Report Hydrometeorological Evaluation, US Army Corps of Engineers, September 1997. Videos are also available at the Oregon Historical Society for the 1964 flood event (Call Numbers 01804 and 01909) and the Multnomah County Library 1996 flood event (Wild Winter, Call Number Video551.489WILD). A February 11, 1996, newspaper article in the Oregonian (Attachment C) notes that "Flooding knocked the Port of Portland, one of nation's busiest ports, out of business. Water covered portions of all five terminals at the port." The combination of these flood reports, photos, and video footage underscore risk concerns regarding failure of the CDF during high velocity Willamette River flows that have not been acknowledged in the EE/CA or by the Port of Portland. In addition to preventing erosion at the toe of the CDF berm, the preferred Alternative C in the EE/CA should include provisions to prevent CDF failure or loss of</p>	<p>The final ground elevation for the proposed CDF design is higher than the FEMA predicted 500-year flood elevation of 31.5 feet NGVD. Consequently, inundation of the proposed CDF by floodwaters is not anticipated at a high frequency recurrence interval.</p> <p>See Response to Comment 84-3.</p> <p>As explained above in response to Comment 75-4, the comparative analysis technique presented in Section 8 of the Terminal 4 EE/CA provides the least subjective comparative analysis tool. In this evaluation technique, two and always only two alternatives are compared to each other, and therefore it is evident using professional judgment and experience, which one rates higher to the other from the aspect of comparison. Rigorously applying this technique for all pairings of alternatives for every aspect of the evaluation criteria provides the least subjective method of comparing removal action alternatives.</p> <p>Hydraulic dredging for Alternatives A, B and D is considered in the EE/CA in Sections 8, Appendix B, Appendix J and Appendix Q, where it is noted that while hydraulic dredging may be feasible, additional constraints and impacts will result from the need to manage a significantly higher volume of water prior to transport to offsite landfills.</p> <p>Risks considered in the EE/CA are appropriately limited to the dredging methods, transport and disposal for the Terminal 4 sediments. Risks associated with transport of dredge sediments from other areas within the Portland Harbor Superfund Site to the CDF or to upland landfills depends on the specific circumstances of that action, and will be considered by EPA specific to that area's removal or remedial action decision.</p>

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		containment due to potential Willamette River flooding during the short-term construction of the CDF and long-term life of the project.	
84	5	<p>In comparing the removal action alternatives against EPA criteria, the EE/CA ranks the preferred Alternative C with the highest overall average score of 0.1333 while Alternative D is considered to exhibit the least overall relative performance at meeting the requirements of the evaluation criteria with an overall average score of -0.3. This subjective, qualitative comparison suggests that dredging with landfill disposal (Alternative D) is less effective than monitored natural recovery (Alternative A), capping in place (Alternative B), or dredging to a confined disposal facility (Alternative C). However, based on the criteria of overall protection of public health and the environment, Alternative D presents the lowest short-term and long-term risk to public health and the environment. For instance, referring to short-term effectiveness, Section 8 of the EE/CA states that Alternative A “represents relatively little risk to the community, site workers, and the environment,” while Alternative B “represents moderate risk,” Alternative C “represents very low risk,” and Alternative D “represents low to moderate risk.” Similarly, Alternative C is preferred in the EE/CA for short-term and long-term effectiveness based on minimal resuspension of contaminants from a hydraulic dredge, and a low probability of exposure during handling and transport of contaminated sediments. However, Section 8 of the EE/CA does not adequately consider the economic and engineering feasibility of hydraulic dredging for Alternatives A, B and D. In addition, Section 8 does not consider the potential for barge accidents during transport to the CDF over the lifetime of the Portland Harbor Superfund project for Alternative C, and does not consider the severity of consequences in comparing the risks of the four alternatives. During the PHCAG Meeting, the Port of Portland suggested that risk scenarios involving variable severity and probability could not be compared in the EE/CA because their differences are like comparing “apples to oranges.” However, similar variable risk scenarios have been evaluated for risk decision-making at hundreds of facilities throughout the United States as required by EPA’s Risk Management Plan Rule (40 CFR 68). A typical reference text for comparative risk ranking under 40 CFR 68 is the Guidelines for Hazard Evaluation Procedures, 2nd Edition with Worked Examples, Center for Chemical Process Safety, American Institute of Chemical Engineers (AIChE). Tables 7.7, 7.8 and 7.9 of this text demonstrate an effective engineering method for ranking risk scenarios based on both probability and severity of accidental releases (Attachment D). Based on the description of probabilities in Section 8 of the EE/CA combined with the severity of consequences described in flood and seismic events in the above OCEH comments, an engineering evaluation of risk using the AIChE procedures would likely result in Alternative C being “Unacceptable” while Alternative D would likely rank as “Acceptable with Controls.” To meet the remedial action objective of overall protection of public health and the environment, the comparative analysis presented in the EE/CA should be reevaluated to include a more objective, engineering-based</p>	<p>As explained in response to Comments 75-4, the comparative analysis technique presented in Section 8 of the Terminal 4 EE/CA provides the least subjective comparative analysis tool. In this evaluation technique, two and always only two alternatives are compared to each other, and therefore it is evident using professional judgment and experience, which one rates higher to the other from the aspect of comparison. Rigorously applying this technique for all pairings of alternatives for every aspect of the evaluation criteria provides the least subjective method of comparing removal action alternatives.</p> <p>Hydraulic dredging for Alternatives A, B and D is considered in the EE/CA in Sections 8, Appendix B, Appendix J and Appendix Q, where it is noted that while hydraulic dredging may be feasible, additional constraints and impacts will result from the need to manage a significantly higher volume of water prior to transport to offsite landfills.</p> <p>Risks considered in the EE/CA are appropriately limited to the dredging methods, transport and disposal for the Terminal 4 sediments. Risks associated with transport of dredge sediments from other areas within the Portland Harbor Superfund Site to the CDF or to upland landfills depends on the specific circumstances of that action, and will be considered by EPA specific to that area’s removal or remedial action decision.</p> <p>The intent of the Removal Action at Terminal 4 is narrowly focused on reducing environmental exposure and risk originating from exposure to the bedded sediments within the Removal Action Area. The capping and CDF technologies included in Alternative C block exposure to contaminated sediments in the relevant areas, which comprise more than 70 percent of the Removal Action Area and include some of the most contaminated sediments. Blocking the exposure clearly reduces the risk associated with sediments in these areas. The EE/CA, see Appendix M, also demonstrates that dredging to the specified depths in Slip 3 will significantly reduce the concentrations of contaminants in surface sediments, thereby reducing exposure of aquatic organisms and reducing risk. The substantial reduction in concentrations also clearly reduces the exposure of other aquatic receptors and ultimately humans from contaminants currently contained in surface sediments.</p> <p>EPA agrees that its decision on the Terminal 4 Removal Action alternative may have an impact on the remedial options for the overall Superfund Site. The Removal Action at Terminal 4 is only one element of the overall remedial action that will occur throughout the Superfund Site. The NTCRA Guidance (EPA 1993) requires EPA to look at the removal action in the context of the overall Superfund Site. Thus EPA considered disposal options, including the CDF, in the context of the overall Superfund Site as part of the EE/CA Appendix Q, 404(b)(1) Analysis Memorandum.</p> <p>Section 8 of the EE/CA discusses that Alternative C (CDF) lends itself to the use of hydraulic dredging. The EE/CA does not state that hydraulic dredging would not be useable for other alternatives (See Section 5.3.1).</p>

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		evaluation of risk that includes severity of consequences as well as probability.	
84	6	The preferred early action Alternative C selected in the EE/CA does not meet the removal action objectives to reduce ecological and human health risks associated with sediment contamination, nor to reduce the likelihood of recontamination of sediments within the removal action area. Although the EE/CA proposes Alternative C as an 'early' action, this alternative assumes a long term remedial option for the overall Portland Harbor Superfund site, and the consequences of this selection will significantly impact future decision-making for all parties involved in the Portland Harbor Superfund process. For this reason, OCEH requests exceptional scrutiny by EPA of Alternative C as the preferred alternative for the Terminal 4 early action.	<p>Thank you for your input. The CDF proposed in the Terminal 4 EE/CA creates excess capacity for disposal of sediments from the Willamette River, but it provides no guarantees for placement of future Portland Harbor sediments, or other disposal siting decisions that require analysis in the Portland Harbor Superfund Site RI/FS. In addition, this early action provides no assurance to the Port regarding further work at the site that may be identified in the harbor-wide cleanup proposal.</p> <p>The Terminal 4 removal action will provide a reduction in risks from contaminated sediment at Terminal 4 and provide an on-site disposal option to consider, if appropriate, for the larger Portland Harbor cleanup. The removal action will remove contaminated sediment, which is uncontrolled within the river, and isolate the contaminants within an engineered facility, thus eliminating potential exposure to aquatic life and humans. Disposal of non-hazardous waste in a CDF is as safe as upland disposal. Criteria will be established for determining the suitability of materials that will be placed in the CDF.</p> <p>An in-water disposal site will reduce the overall impact and potential environmental and public safety implications associated with transport of materials to offsite disposal facilities. Having one or more disposal options for the Portland Harbor Superfund Site also helps control the cost of disposal because it creates a more competitive market for disposal and may also make removal of contaminated sediment a more cost-effective cleanup option. Consolidation of contaminated sediments into a limited number of locations may reduce the area within the Willamette River where contaminated sediments would be contained in place.</p>
84	7	In summary, OCEH recommends the selection of Alternative D to meet these objectives, or reevaluation of the EE/CA to address the concerns outlined above and in Attachment A. Furthermore, OCEH recommends additional economic and engineering feasibility analysis of hydraulic dredging combined with dewatering of sediments as a technical solution for alternative D to reduce the risk of recontamination during removal of selected contaminated sediments.	Thank you for your input. All alternatives in the EE/CA will protect human health and the environment and they were evaluated using established criteria of effectiveness, implementability, community acceptance and cost. See Responses to Comments above.
84	8	Thank you for creating a process for receiving public comments on the EE/CA. Please consider the OCEH comments as EPA continues to coordinate the cleanup and restoration of the Portland Harbor	EPA appreciates your involvement in this analysis.
85	1	ORRA appreciates the time, effort, and money that the Port of Portland (the Port) has invested in developing the four cleanup alternatives. The result of that effort is a determination that a Confined Disposal Facility (CDF) is the preferred cleanup alternative, and that choice is the focus of these comments.	Thank you for your input.
85	2	Upland Disposal Provides Significantly Better Long-Term and Overall Environmental Protection. ORRA is not convinced that a CDF is the best environmental solution for the contaminated river sediments problem. Upland disposal sites have significantly better long-term environmental protections that the CDF cannot provide. Upland disposal sites have geological and climate advantages, as well as multiple protections of groundwater. They are lined, permitted facilities that meet and exceed the requirements of federal and state laws. A CDF does not meet the same criteria.	See response to Comment 75-11 and response to Golder Comment 1 .
85	3	ORRA does not agree that CDF disposal satisfies Applicable or Relevant and Appropriate Requirements (ARARs) for solid waste disposal. Under Oregon regulations, contaminated sediments from a Superfund cleanup are considered "cleanup materials contaminated	See response to Comment 75-15 .

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		with hazardous substances." OAR 340-093-0030(14); OAR 340-093-0170. If disposal is determined to be the appropriate management strategy, then Oregon regulations and CERCLA require disposal at a landfill that meets the substantive design requirements of 40 CFR Part 258, Subpart D or an approved alternate design that satisfies specific performance criteria. OAR 340-093-0170(3)(a). While the Engineering Evaluation/Cost Analysis (EE/CA) Report asserts that CDF disposal will comply with ARARs, it does not explain how, especially given that the CDF is an unlined facility that does not meet the Part 258 standards or the alternate performance criteria.	
85	4	With CDF Disposal, Long Term Environmental Risks Will Remain. The EE/CA Report asserts that leaching of contaminants from the silt particles will not occur as long as the silt remains wet, thus the CDF is the best environmental solution. However, a CDF does not remove the risk from the river environment. An arid landfill site has long been accepted as the best repository of such contaminants, and is the only alternative that actually removes the contaminated sediment from the river.	See response to Comment 75-11 and response to Golder Comment 1 .
85	5	Upland disposal is the only reasonable option that embraces the regionally accepted goals of environmental protection at a reasonable cost.	See response to Comment 1-1 .
85	6	The EE/CA Overstates the Incremental Benefits of the Effect of Hydraulic Dredging. The EE/CA also contends that the CDF alternative provides better sediment containment because hydraulic dredging is possible, a technology that doesn't disturb the water column to the degree of other dredging methods. Since only 30% of the material going into the CDF can be placed using hydraulic dredging, the water column sedimentation benefit should not be highlighted as a major benefit in this case.	Hydraulic dredging is an attractive method for filling the CDF because a relatively high dredging production rate can be maintained in Slip 3. With respect to the sediment containment benefits of hydraulic dredging, the sediment analyzed in the EE/CA is limited to the Terminal 4, representing 100% of the sediments evaluated.
85	7	The Excess Capacity from the CDF Disposal Alternative Circumvents Important Regulatory and Permitting Requirements and Sets a Poor and Unfair Precedent for Solid Waste Disposal	Any additional sediment proposed to be placed in the CDF will need to meet established criteria (criteria will be subject to a public input process). The CDF proposed in the Terminal 4 EE/CA creates excess capacity for disposal of sediments from the Willamette River, but it provides no guarantees for placement of future Portland Harbor sediments, or other disposal siting decisions that require analysis in the Portland Harbor Superfund Site RI/FS. In addition, if no additional contaminated sediment is placed in the CDF, the Port will need to apply for applicable federal and state approvals to fill with clean fill or other dredged material from navigation dredging. If no other fill is allowed, EPA may need to consider whether the Terminal 4 cleanup requires modification to assure protection of human health and the environment in the long-term.
85	8	The relative cost differences between the four alternatives are not large. In fact, the CDF alternative is the most expensive of the alternatives, unless the Port is actually able to recover its projected \$10 million in savings by charging others to dispose of their contaminated sediments in the CDF as well. This leads to a number of additional concerns	See response to Comment 75-16 .
85	9	If the CDF option benefits from disposal of off-site materials in the amount of 570,000 tons, the Port should describe how the material will be removed from its point of origin, transported and off-loaded into the CDF. Anything short of a reasonable understanding of the project methods casts doubt on the actual cost savings.	In order to move a project forward, some of these details are worked out in the design phase of the project. Public input is important to this phase of the process as well.
85	10	What are the limits on the types of sediments that can be accepted at	As described in Section 9.3 of the EE/CA, as part of the Slip 1 CDF design, EPA will establish suitability

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		the CDF? CDF sites are allowed to by-pass most of the state's permitting processes through special exemptions. If the CDF will be used for materials not actually within the scope of work of the immediate cleanup, then the Port will be competing with the private sector without the same level playing field.	criteria for all sediment proposed for disposal in the CDF. Contaminated sediment that fails the typical tests used to characterize waste as hazardous will not be allowed in the CDF. In addition, EPA will require a public input process for establishing the suitability criteria. Creating disposal options for the Portland Harbor Superfund site at Terminal 4 may help control the cost of disposal because it creates a more competitive market for disposal.
85	11	Before accepting any third party waste, the Port should be required to go through a public permitting process and meet all state criteria for a RCRA Subtitle D landfill, like every other facility in the state of Oregon must do prior to accepting this material. This includes liners, surface and ground water monitoring, waste acceptance procedures and plans, financial assurance plans for closure and post closure, and other pertinent criteria of subtitle D and the Oregon Rules.	See response to Comment 75-15 , 75-16 , and Golder Comment 1 .
85	12	The economic analysis, which concludes that \$10 million can be saved by charging third parties for future use, is unsubstantiated and appears to potentially put the Port and tax payers at risk of funding what would be the most expensive option, if other sources of sediment do not materialize or responsible parties elect not to use the CDF because of long-term environmental liability or economic concerns. There is no guarantee that other parties will elect to use this facility if it is built.	Construction of the CDF at Terminal 4 will create an on-site disposal option for consideration in making harbor-wide cleanup decisions. See response to Comment 1-1 . Although cost was considered as part of the EE/CA analysis, it was not the driving factor for selection.
85	13	The CDF alternative sets a worrisome precedent for the region. Other areas of the Willamette and Columbia Rivers could become potential repositories of contaminated materials, for the sake of minor financial benefits while risking serious long-term environmental damage.	CDFs have been used with great success in the Northwest. In Commencement Bay alone, several million cubic yards of contaminated sediment have been safely and permanently contained.
85	14	In conclusion, ORRA believes that a fair review of the four alternatives would lead to the conclusion that upland disposal is the best environmental solution for the contaminated sediments cleanup.	The evaluation of alternatives in the EE/CA found that all alternatives, including both upland and CDF disposal of contaminated sediments are protective of human health and the environment. Alternative C was identified as the strongest option for eliminating risk pathways.
85	15	(Footnote ¹ : Of the remaining alternatives, ORRA's opinion is that both the "cap-in-place" and the "monitor-in-place" alternatives should be rejected because neither provides a better environmental solution than upland disposal and the relative cost savings are minor as well. As discussed in these comments, ORRA believes that upland disposal is the best available alternative.)	Capping and monitored natural recovery can not be used everywhere, but they can be valuable tools for reducing risks posed by contaminated sediment and are part of the preferred alternative.
86	1	On behalf of various City of Portland bureaus we appreciate this opportunity to comment on the Port of Portland proposed cleanup of contaminants at Terminal 4 in the Lower Willamette River. This early cleanup effort is one of three being undertaken in advance of the larger scale investigation and feasibility study of actions needed to address a broader range of contaminants in the Portland Harbor Superfund site. The City is participating and providing major funding support for that larger investigation in order to speed the assessment and cleanup of the entire Harbor area. This longer-term effort is being funded by the Lower Willamette Group, which includes the City, the Port and a number of private parties proceeding under the supervision of the U. S. Environmental Protection Agency (EPA)	Thank you for your input.
86	2	We are pleased that the Port, Northwest Natural Gas and, more recently, Arkema have agreed to undertake early cleanup actions at some of the most contaminated sites in the Harbor. We are also	EPA agrees that actions are required to protect human health and the environment and early actions should be completed wherever possible.

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		<p>gratified that EPA, the Oregon Department of Environmental Quality (DEQ) and six partner Tribal governments have devoted the resources and time to provide impetus and guidance for these actions. Early cleanup activities such as these need not wait for the overall Superfund site assessment and, if conducted in a timely and effective manner, they can significantly reduce the risks to human health and the environment long before the site as a whole can be addressed.</p>	
86	3	<p>The City has monitored the Port's proposed Terminal 4 early action from the outset. We have reviewed the recently released Public Review Draft, Engineering Evaluation/Cost Analysis (EE/CA) Report. The City acknowledges the significant amount of work that has gone into the preparation of this report and commends the Port and governmental entities for advancing the effort to this stage. The work completed to date by the Port has been undertaken in an open process through which a variety of potential technologies—including dredging, capping and treatment--were identified, reviewed and assembled into remedial alternatives. These alternatives were then screened against specific criteria established by EPA for Superfund site cleanups. The preferred alternative identified through this process emphasizes dredging to physically remove the highly contaminated sediments, primarily located in Slip 3 at Terminal 4, and dispose of them onsite in a confined disposal facility to be constructed in Slip 1.</p>	<p>Thank you for your input.</p>
86	4	<p>The City is supportive of this early action concept and this effort to improve river health. However, it must be acknowledged that any removal of contaminants and disposal at this site near the mainstem channel of the Willamette entails risks and uncertainties. These will need to be addressed in more detail as the early action design work proceeds.</p>	<p>We agree that the design work is very important in making sure that the select action yields the anticipated benefits.</p>
86	5	<p>we are concerned about the potential impacts of the project on sediment quality outside the early action area during construction,</p>	<p>A detailed Removal Action work plan will describe the construction activities and schedule, as well as procedures to protect the public, site workers and the environment during all field activities. Mitigating measures such as silt curtains or other in-water controls will be described and reviewed by EPA. In addition, a Removal Action Area-specific Health and Safety Plan (HASP) outlining and detailing mitigating measures against potential hazards such as air emissions during construction and operational activities will be prepared and adopted. Short-term impacts to the environment will be minimized by adopting appropriate control mechanisms (e.g., dust control) and adhering to legally applicable or relevant and appropriate requirements.</p>
86	6	<p>we are concerned about the potential long-term effects to surface water quality during and after construction</p>	<p>The Removal Action Work Plan will describe the criteria for surface water quality (to be included in the Water Quality Certification process) and measures to be implemented to achieve the criteria. Specifics of design and construction of containment technologies and best management practices will be included in the Work Plan. The Water Quality Certification will require certain actions and criteria to be met, and contingencies for implementation.</p> <p>Long-term effects to surface water quality will be addressed by the EPA-required CDF monitoring program. In evaluating the long-term effectiveness of the Removal Action, EPA have identified a number of post-removal site controls that will be implemented. These include periodic monitoring, sampling and analyses to evaluate the progress of the monitored natural recovery (MNR) and to verify the long-term adequacy of the performance of the sediments caps. In addition, post removal action confirmation sampling and analysis will be conducted after construction to provide direct measurement of residual concentrations.</p>

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			Corrective actions will be taken if caps or dredged areas fail to meet performance requirements. All of these are being required by EPA to ensure that releases from the CDF do not occur.
86	7	we are concerned about the long-term stability of the confined disposal facility	The proposed Removal Action has undergone a evaluation by EPA to make sure that rigorous examination of flooding, earthquakes and other catastrophic event was part of the evaluation of Alternatives. Please see the responses to Comments 2-6 and 2-8
86	8	we are concerned about how this work will be integrated with the overall Portland Harbor Superfund clean up approach	Please see response to Comment 1-1 .
86	9	how proposed mitigation activities will fit with the City's River Renaissance and watershed management initiatives.	Because Terminal 4 is limited in size and there is no public access, it is unlikely that this early action will have a significant effect on River Renaissance or watershed management initiatives. Please see the response to Comment 6-2 and Comment 28-35 for additional detail on mitigation.
86	10	We emphasize the need for careful design, implementation and monitoring to minimize the risk of spreading contaminants during construction. We also understand, as members of the concerned public are making clear, that disposal of contaminated sediments within the Superfund site and adjacent to the river channel is controversial, that it must be undertaken with rigorous safeguards in place and that it must include a sound monitoring program to ensure that the materials will be safely contained for a long period of time. A detailed long-term monitoring plan with a clear action plan will help ensure that any difficulties that may arise can be addressed in an expeditious manner.	Based on multiple comments like yours, EPA reviewed the adequacy of the evaluation of a CDF. We remain satisfied that a CDF is a technically sound and feasible method for disposal of certain contaminated sediments and is a permanent solution to eliminate potential exposure to human health and the environment. Please see the response to Comment 86-6 for additional information about long-term effectiveness and post-removal site controls, and monitoring.
86	11	A sound mitigation program will also be needed to help ensure compatibility with the City's interest in Lower Willamette River restoration.	See response to Comment 86-9 .
86	12	The City intends to follow closely the detailed design of the final remedy and the development of the monitoring program and related action plans.	Thank you for your input.
86	13	In order to gain public confidence in the project, it will be important that the early action design and implementation, including appropriate mitigation activities, are reviewed and undertaken in an open public process with the public interest in mind and it will be important to demonstrate that the project clearly contributes to the collective goal of improving Willamette River health for the long term.	EPA will provide additional public involvement opportunities relating to this project. Selection of appropriate sediment disposal criteria will be open to public comment. In addition, proposals from additional PRPs within Portland Harbor to dispose of sediment in the CDF will be subject to the public input process.
86	14	In the course of further deliberations on the project, we recognize the confined disposal facility is currently the preferred alternative and that it may have other benefits in the context of the overall cleanup. Nonetheless, we want to be certain that other alternatives developed to date are not lost in the event the confined disposal facility becomes, on further examination, inappropriate or otherwise infeasible.	Please see the response to Comment 42-2 .
87	1	<p>ODFW's main objectives are to:</p> <ul style="list-style-type: none"> • Provide for an uncontaminated habitat for the area's fish and wildlife species to thrive and reproduce in; • Maintain or enhance the current amount of useable habitat for all species found in the area; • Provide for and maintain a continuing recreational fishery for all game and sport fish present in the area; and • Assure that fish harvested in the area are safe to 	Thank you for your input. EPA's objectives are consistent with ODFW's.

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		consume.	
87	2	Under the "Removal Action Objectives" (Chapter 4), one of the objectives should be to minimize the impacts to fish and wildlife species habitat affected by the action for both the short and long term. This is an additional standard beyond ecological health risks. It basically speaks to considering the habitat values provided in those areas where cleanup actions will take place and either designing the cleanup action to provided similar or enhanced habitat values after the cleanup is complete in those areas or providing similar replacement habitat values within the Portland Harbor area.	The "Removal Action Objectives" were established and approved by EPA in the Work Plan (Section 6.2.1), as required by the Administrative Order on Consent and attached Scope of Work. However, the Removal Action must comply with ARARs to the extent practicable, including the Clean Water Act (CWA) Section 404(b)(1) and the Endangered Species Act (ESA), both of which provide for minimizing impact to aquatic species during construction of the project. In addition, Section 404 of the CWA provides for mitigation of aquatic habitat impacted by the project. The potential requirements of the CWA 404(b)(1) and the ESA are evaluated in EE/CA Appendices Q and P, respectively. Under Alternative C, provisions of the CWA 404(b)(1) will require compensatory mitigation for lost aquatic habitat in Slip 1. Appendix Q describes the types of considerations that will be addressed in the CWA 404(b)(1) analysis, and outlines a process and schedule for development, review, and approval of a mitigation plan prior to construction. To address requirements of the ESA, a Biological Assessment was prepared (EE/CA Appendix P) and will be finalized based on the final design considerations, subject to review by NOAA and USFWS. EPA anticipates that ODFW will be a key reviewer of the CWA 404(b)(1) analysis, the mitigation plan, and the BA.
87	3	For all alternatives ODFW believes that monitoring for impacts on fish and wildlife is an important component of any cleanup and should be factored in as a long term endeavor (especially if some contamination is to remain on site). Monitoring should go beyond chemical analysis of sediment and water to bioaccumulation and other effects within the biota (especially invertebrates and bottom feeding long lived species such as sturgeon).	EPA looks forward to working with ODFW and other resource agencies to incorporate these types of concerns as we develop and implement monitoring programs during the design phase of the Terminal 4 project. One of the challenges we face is determining how to appropriately assess the effectiveness of the site specific removal action independent of contaminants and other special and temporal influences of the larger Portland Harbor site.
87	4	The five year time frame for monitoring effects to the ecology of the harbor is too short to ascertain whether there are any long term continuing effects. There should be a continuing evaluation of the biota over a much longer time period. Monitoring may be scaled back over time to periodic sampling and reviews (say every five years) and could be combined with a Portland Harbor wide periodic review of ecological health in the harbor	See response to Comment 87-3 . EPA agrees that monitoring may be needed beyond the initial 5-year monitoring period in order to ensure the continued protectiveness of the removal.
87	5	The monitoring strategy should also take into account long term stability (longer than 5 years) of those measures which leave contaminated sediments in place (Capping, CDF, and MNR). At a minimum monitor for contaminant leaching and erosion.	See response to Comment 87-3 .
87	6	Additionally, there should be a plan for evaluating control structures after major events such as earth quakes, high intensity storm and flood events	EPA will make sure that specific language is included in a monitoring plan to ensure the CDF is examined immediately following a catastrophic event
87	7	Monitored Natural Recovery (MNR) sites should include monitoring of contaminate effects on the biota such as invertebrates. Biota should be analyzed for bioaccumulation, species component changes and physiological effects.	Thank you for your input. See response to Comment 87-3 . EPA will consider the proposed assessment during review and approval of the final monitoring program.
87	8	Sediment dredging: to minimize the impact to fish species work should be accomplished within the "In water work period". ODFW would prefer that any dredging be conducted during the "summer" in-water work period for the Willamette River (July 1 – Oct 31). There is more risk for contaminated sediment escaping work sites during the winter high flow periods and far more juvenile salmonids are present during the winter work period. Dredge sites should also be isolated to contain sediment laden/turbid water from escaping the work site (turbidity/sediment curtain). Fish should be salvaged from isolated	See response to Comment 87-2 .

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		work areas. If some actions require working in water outside this period ODFW's requests that the district biologist and office be consulted in order to provide recommendations for reducing potential impacts to fish species that may be present.	
87	9	Sediment capping: Determine the types of habitats that are being covered and consider engineering the cap to provide for similar or enhanced habitat to what is being covered or providing for the habitat elsewhere. Monitor for contaminant leakage and effects on biota (invertebrates) over an extended period. Develop a plan to evaluate the stability and durability of the cap over time and after major high intensity storm and flood events.	The habitat-related issues will be addressed with the mitigation planning process referred to in response to Comment 87-2 . Long-term monitoring of the caps and CDF for structural integrity and performance will be included in the site monitoring plans.
87	10	Confined Disposal Facility (CDF): The slip is used by a variety of sport and game fish. In consultation with ODFW devise a method for salvaging sport and game fish out of the slip and then excluding them from returning as the slip is converted to a containment facility.	The conservation measures referred to in response to Comment 87-2 addresses the salvage and protection of fish species during implementation of the Removal Action. Please also see Appendix Q of the EE/CA for more details. The mitigation planning process referred to in Comment 87-2 will consider lost habitats and mitigation requirements.
87	11	Determine the types of habitats being lost through conversion of the slip and propose a method for providing similar or enhanced habitat elsewhere.	Please see response to Comment 6-2 .
87	12	Again ODFW thanks you for the chance to comment on the alternatives for cleaning up the T4 site and is encouraged that the Port of Portland is moving ahead with plans to address contamination in Portland Harbor.	Thank you for your input.
88	1	I don't think the CDF is a good idea. There are too many questions about the long-term impacts of this project. Along with the Portland Harbor Community Advisory Group (CAG) evaluation committee, I looked over the EE/CA, the Golder memorandum, listened at CAG meetings, and read other groups' letters. The CDF planned is inadequate to contain the sediment from the Portland Harbor cleanup. It will leak and the berm will liquefy; in a disaster, all the contaminated sediment will be back in the Willamette River.	EPA has noted your preference. Please see response to Comments 2-3 , 2-6 , 2-8 , and 5-2 .
88	2	The public health impacts of this sediment recontaminating the Harbor are enormous. The impacts to fish and other wildlife would be huge. You've gone to a lot of trouble to find out how bad the pollution is in the Harbor. The fish resident in the Portland Harbor suffer measurably. Don't let the toxins back in the river after removing them.	All of the alternatives analyzed in the EE/CA will result in long term benefit to the community from reducing the risk of exposure to contaminated sediment. Under the proposed alternative, uncontrolled pollution that currently poses a risk to human health and the environment will be removed and placed into a well designed disposal facility. Sediment placed in the CDF is not hazardous waste under the law. See response to Golder Comment 1 .
88	3	we have concerns about the viability of the proposed facility in both earthquake and flood conditions and many questions about the long-term ecological and human health impacts.	The proposed Removal Action has undergone a rigorous evaluation by EPA to make sure that flooding, earthquakes and other catastrophic events were adequately addressed in the evaluation of Alternatives.
88	4	This CDF, as the Port has pointed out, is a landfill operation and, as such, must meet Federal and State regulations for landfills. These include detailed studies of active faults within 3000 feet of the CDF site; locating no closer than 200 feet of an active fault (defined as movement within the last 10,000 years) for solid waste, and 1,320 feet if the waste is classified as hazardous; the CDF must be designed for a maximum horizontal acceleration with a 2,475-year return period. The report from Golder Associates suggests that adequate analysis of the risks from earthquake has not been done	Please see the response to Golder Comment 1 .

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		and that compliance with applicable Federal and State laws for landfills in earthquake zones will ultimately not be achievable.	
88	5	The Port's consultant, BBL, ignored the potential for liquefaction of the CDF berm, the hydraulic soils placed behind the berm and the soils adjoining the berm. The Golder analysis predicts that approximately 30 feet of alluvial soil is anticipated to liquefy at the toe of the CDF berm and that approximately 20 feet of alluvial soil is also anticipated to liquefy beneath the berm during a CLE earthquake. Risks of this nature are unacceptable to the public and relying on an engineering fix after federal approval skirts applicable laws and would require further public comment.	See response to Golder Comment 5 .
88	6	The conceptual design for the berm does not address potential erosion or scour along the river side toe of the berm during peak flood events. Regulatory requirements for disposal of contaminated materials in floodplains state that a proposed facility cannot "expand or modify a landfill in a floodplain in a manner that will allow the facility to result in washout of solid waste so as to pose a hazard to human life, wildlife or land or water resources." The proposed CDF design does not adequately address this criterion with respect to provisions for bank erosion from the dynamic movement of the river or scour. It also does not address erosion along the toe of the berm during peak flows or in the event of an earthquake.	Berm construction details described in Appendix K of the EE/CA were reviewed based on your concerns and were found to be addressed adequately. Some of the measures include placing clean sandy gravel fill within training berms. Training berms are usually built using quarry spall, rip-rap in order to be erosion resistant. During the design the erosion potential will be evaluated and the rip-rap size selected accordingly.
88	7	A section on recontamination/re-suspension is missing from the report. The impacts of deposition and erosion along the river and the impact on dredging, capping, the CDF berm, and natural attenuation should be given significantly more discussion and consideration.	See response to Comment 28-26 .
88	8	In summary, this proposal for a confined disposal facility in the Willamette River is not rigorous enough in design to provide adequate assurances to the public that it will withstand both earthquake and potential flood events.	Please see responses to the Golder report .
88	9	Furthermore, additional questions remain in regard to this site's projected lifetime and the level of monitoring and maintenance that would be required.	Alternative C, as proposed, is a long-term and permanent strategy to isolate and control contaminated sediments. Long-term monitoring will be an essential part of evaluating the effectiveness of the Removal Action and the ongoing integrity of the CDF. The final monitoring plan has not been developed yet, but it will require extensive monitoring for the first 5 years, and every 5 years. Maintenance of the CDF was considered during the preliminary design and EE/CA evaluation. The feasibility-level cost estimate for CDF maintenance was \$500,000, applied to a 30-year timeframe.
89	1	The St. Johns Neighborhood Association is concerned with the concept of the Confined Disposal Facility at the Port of Portland's Terminal 4 and the storage of contaminated sediments in North Portland.	Alternative C represents very low short- and long-term risk and is anticipated to have a neutral or positive influence in the community.
89	2	We support the process of targeting clean up areas for Early Actions, but feel the T4 site might not be a good candidate for an Early Action, especially if it is to move the contaminants from in water to in ground with no option to later go back and clean these contaminants up at a future date.	The use of a CDF is not intended to be a temporary cleanup measure. The materials placed in the CDF will be non-hazardous materials, and when full, the slip will be converted into water dependent use by the Port. Please see response to Comments 2-3 , 5-2 , and 1-1 .
89	3	We understand that capping and/or a CDF will lower the health risks in water but find that the risks would be left on land (the generation of a Brownfield) with would not be acceptable to our community here in North Portland.	Capping and confined disposal facilities are proven methods for protecting communities and ecological receptors from exposure to contamination. However, they do require long-term monitoring and maintenance.

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89	4	A community that is already being asked to accept the health risks of a leaking landfill (St. Johns Landfill), a Wastewater Treatment Plant, a clean up site that was capped (McCormick & Baxter Site), and the constant air pollution from freight traffic (diesel trucks and rail engines). We understand that these are considered different types of risks and are not looked at as comparables when evaluating cleanup options, but we feel they should be looked at. Are these different types of contaminants additive when it comes to a community's health? Should a cleanup option/method take into consideration preexisting conditions within a community regarding health?	EPA shares your concern that your north Portland neighborhood has inherited a legacy of contamination from a century of historical industrial practices. Multiple exposures to contaminants can be a legitimate concern, and it is one of the reasons that capping or confining material in a CDF are important actions to protect human health. Additive and cumulative effects are not a concern specific to the Terminal 4 removal. The harbor-wide cleanup will likely propose a variety of cleanup actions needed to address concerns posed by cumulative or additive contamination problems.
89	5	In capping options as with the CDF option we would be asking to place these contaminants into a perpetual storage without the option to cleanup and treat the contaminants at a future date with new technologies as they develop. We must not be in such a hurry to rush in to cleanup a site with a method that will not leave future generations a way to take care of these sediments in an appropriate treatment.	It is important to reduce or eliminate the direct exposures to contamination that currently exist at Terminal 4 by capping, dredging and disposal. Existing treatment technologies were determined not to be practical or effective for Terminal 4. It would be irresponsible for EPA to delay cleaning up Terminal 4 until a feasible treatment technology is developed.
89	6	No one has a crystal ball to see what the future lays before us. There might be catastrophic events; there might be small incidents of failures. But what is truly important is that we move forward with making our communities a better place whenever we can. Improve our way of doing business, our way of stewardship of our resources and lastly and no less important our way of embracing our local communities. We believe the Port of Portland is wanting to do the right thing in this cleanup and applaud their desire to step forward and try to address these contaminated sediments.	USEPA agrees that early action will help protect human health and the environment .Please see the response to Comment 2-3 and Comment 12-1 .
89	7	we do not feel that either capping or a CDF is in the best interest of the communities of North Portland.	Your concern is noted. It is important for EPA to evaluate the full range of options available for reducing risk to human health and the environment from uncontrolled contamination in sediment.

Attachment B
Preface Text for the A & B Comment Set

ATTACHMENT TO ~~FEBRUARY 19, 2008~~ JULY 13, 2007 LETTER
RESOLUTION OF 'A' LEGACY SITE SERVICES COMMENTS ON THE DRAFT
ARKEMA EARLY ACTION EE/CA WORK PLAN PREPARED BY
PARAMETRIX FOR US EPA

Deleted: EPA does not necessarily intend or agree with the statements made in this forward section. ¶

This document contains a complete set of Legacy Site Services (LSS) comments on the Draft Arkema Early Action EE/CA Work Plan prepared by Parametrix for US Environmental Protection Agency (EPA Work Plan).

Explanation of table column headings:

LSS Comment Number:	A sequential number applied by LSS to identify each individual comment in the table.
Comment Priority:	A hierarchical designation provided for each comment to indicate the level of priority placed on the comment by LSS. The "A" designation is a comment that required technical discussion and resolution to EPA's and LSS' satisfaction. LSS subsequently requested formal dispute on "A" comment No. 38. LSS chose to not dispute the "B" designated comments once the "A" designated comments were satisfactorily resolved.
EPA Work Plan Page/Section Number	Identifies the Page and Section number of the EPA work plan to which the comment is directed.
Comment/Problem Statement	Provides LSS' comment and/or problem statement that requires resolution.
Solution	Provides LSS' proposed solution for resolution of the comment/problem.
Comment Resolution EPA comment number	Provides the resolution of the comment. Provides a cross-reference to the original comment number provided by EPA on the September 26, 2005 work plan, where applicable.

Deleted: The comments contained in this document include comments that LSS is willing to accept as well as comments that will need to be addressed prior to finalization of the EPA work plan for LSS to forgo formal dispute. Also, SS notes that a significant number of the "non-responsive" comments included in EPA's September 21, 2006 letter disapproving the LSS Revised Work Plan are not addressed in the EPA Work Plan. Many of these comments included requirements that have not been met in the EPA Work Plan although these requirements were the basis for EPA's decision to disapprove and reserve to itself modification of the LSS Revised Work Plan. It appears that EPA has set different standards for Parametrix and LSS, and because LSS seeks assurance that the EPA Work Plan is sufficient to meet all EPA standards and will not be modified after these current negotiations are completed, LSS requests that EPA withdrawal of the "non-responsive" comments that are not addressed in the EPA Work Plan. For a more complete explanation of the issues related to the dispute, see the text of the July 13, 2007 letter.

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