

RESPONSIVENESS SUMMARY FOR LOCKHEED SHIPYARD SEDIMENT OPERABLE UNIT EXPLANATION OF SIGNIFICANT DIFFERENCES

This Responsiveness Summary summarizes and provides responses to comments received by EPA during the 30-day public comment period provided for the draft ESD for Lockheed Shipyard Sediment Operable Unit. The draft ESD described six remedial strategies and proposed one for implementing the remedy selected in the ROD for Lockheed Shipyard Sediment Operable Unit.

The public comment period for the draft ESD ran from December 26, 2001 through January 24, 2002. A fact sheet was mailed to parties on the mailing list for the Lockheed site and a newspaper article announcing the public comment period appeared in the Seattle Times on December 26, 2001.

Comments were received in writing from the following parties:

- Lockheed Martin Corporation (LM)
- Muckleshoot Indian Tribe (Muckleshoot)
- National Oceanic and Atmospheric Administration (NOAA)
- Port of Seattle (Port)
- TechSolv
- Todd Pacific Shipyards Corporation (Todd)
- Washington Department of Ecology (Ecology)
- Washington Department of Fish and Wildlife (WDFW)
- Washington Department of Natural Resource (WDNR)

Significant comments are summarized below, largely verbatim. In some cases, comments are grouped when more than one commentator made a similar comment. The commentator is identified in parenthesis after the comment. EPA's response follows each comment. Comments are organized by subject.

GENERAL COMMENTS ON EPA'S PROPOSED STRATEGY FOR IMPLEMENTING THE ROD.

1. Comment 1: DNR supports the ESD and concurs with the NOAA's comments for the selection of Strategy 18C of the LSSOU ESD. DNR generally supports EPA's selection of the strategy for clean up of the Lockheed Shipyard Operable Unit. (Department of Natural Resources)

The WDFW agrees with the EPA recommendation of the cleanup efforts in open waters since all contaminants will be removed and disposed of at an upland landfill site. Until more detailed cost estimates are available, WDFW recommends Strategy 1

because it provides the most comprehensive cleanup and may not be as costly as some of the other alternatives. (Washington Department of Fish and Wildlife)

Based on our natural resource trust responsibilities and consultative needs for listed species and their habitats under the Endangered Species Act, we recognize Strategy 18C as being the most protective of the aquatic environment among the more cost-effective strategies. However, NOAA's preference is complete removal of contaminated sediments with non-aquatic disposal. (National Oceanic and Atmospheric Administration)

The Lockheed Shipyard Sediment Operable Unit is an important location where the Tribe exercises its federally-adjudicated fishing rights. The cleanup area is in the Muckleshoot Indian Tribe's Usual and Accustomed Fishing Grounds. Adequate cleanup of the Duwamish River is necessary for the protection of the health of tribal fishers exercising their treaty rights in this area and for the protection of the aquatic ecosystem, which contributes to the health of the fishery itself. The Muckleshoot Tribe prefers "the removal of the maximum contamination possible". (Muckleshoot Indian Tribe)

Response to Comment 1: As determined in the ROD, contamination exceeding the CSL may be left in place if the cost, benefit, technical feasibility analysis indicated that removal instead of capping contamination exceeding the CSL was either not feasible or that the cost outweighed the benefits. EPA concluded in the ESD that the costs exceeded benefits when dredging all sediments exceeding the CSL instead of capping sediments exceeding the CSL. Commentors have not offered additional information for EPA to reconsider its cost, benefit and technical feasibility evaluation. Further discussion on EPA's cost, benefit and technical feasibility analysis is provided in the next section, Cost, Benefit and Technical Feasibility Evaluation.

2. Comment 2: The ESD is inconsistent with the findings of the Basis of Design Report (Hart Crowser, 2000a), which concluded that the capping-only remedy is the most cost-effective and environmentally sound solution for the site. Further, the ESD requires Lockheed to dredge sediments below the CSL thus imposing a higher remedial standard than required by EPA's remedy selected in the 1996 ROD. (Lockheed)

Response to Comment 2: EPA has not approved the Basis of Design Report because EPA disagreed fundamentally with the report including Lockheed's preferred capping only remedy. EPA documented its comments to Lockheed in writing. Lockheed has failed to respond to EPA's comments. EPA opposed the capping only remedy because Lockheed's preferred remedy of capping failed to satisfy ROD remedy requirements such as restoration of marine habitat to its most productive condition (to the extent practicable) and compliance with Clean Water Act Section 404 - to prevent loss of tidal and subtidal marine habitat. Lockheed's preferred remedy, capping without

dredging, would fill in nearshore marine habitat. The capping only remedy is incompatible with reasonably anticipated future use for a long-standing working waterfront water-dependent use facility. Additionally, EPA considered that the process used by Lockheed to evaluate alternatives and to recommend a preferred alternative in its BDR was seriously flawed. EPA's reasons are numerous and are stated in EPA's letter of March 2, 2000. EPA's March letter is available in the Administrative Record for public review.

Lockheed's comment that refers to the ESD requiring remediation of contaminated sediments to a higher standard than required by the ROD (i.e., dredging sediments contaminated below the CSL level as opposed to capping sediments contaminated below the CSL level) refers to the open water SMU at LSSOU. However, the cost of dredging the open water SMU (as in Strategy 18C) is less than capping part of the open water and dredging and capping other parts of the open water SMU (as in Strategy 18D).

If the part dredge/part cap strategy (Strategy 18D) were to be implemented, the surface of the open water SMU would not be smooth. There would be dredged area that would be 5 feet deeper and there would be capped areas that would be elevated by 3.5 feet, thus making the open water SMU surface consist of hills and valleys. The requirement for smooth surfaces is directed at mitigating recontamination. The costs to satisfy the ROD requirement for smooth surfaces, not hills and valleys, were not included in the cost of Strategy 18D.

COST, BENEFIT AND TECHNICAL FEASIBILITY EVALUATION

1. Comment 3: The document assumed that the dredged depth would be 3.5 feet deep for cost analysis purposes, although this could be modified depending on benefits, costs and technical site constraints. The WDFW recommends that an evaluation be conducted to assess whether or not a 3.5 foot dredge depth is sufficient enough to effectively isolate contaminants at the project site. (Washington Department of Fish and Wildlife).

Response to Comment 3: The ROD states that the "extent of dredging of contaminated sediments and waste under piers...will be determined during remedial design based on cost, benefit and technical feasibility". However, that does not mean that cap thickness will be determined based on a cost, benefit and technical feasibility evaluation. The cap must be chemically and physically confining. Parameters to isolate contaminants, such as cap thickness, will be determined during design. The degree to which the cap confines contaminants can not be reduced by a cost, benefit and technical feasibility evaluation. At present, EPA is only assuming a 3.5 foot thick cap for discussion and cost purposes.

2. Comment 4: Strategy 1, which would remove the largest amount of sediments

exceeding the CSL, is estimated to have the highest cleanup costs. The WDFW questions whether this assumption is accurate. Since we do not know the condition of the existing bulkhead, we are unable to assess which is providing more slope stability - the bulkhead or the pilings. If the bulkhead is in very poor condition, a greater percentage of pilings would need be cut off below the mudline and remain in the sediments in order to protect the integrity of the slope. Cutting off pilings below the mud line can be very labor intensive and time consuming, and it could significantly increase the cost estimates for cleanup. (Washington Department of Fish and Wildlife).

Response to Comment 4: On January 17, 2002, Lockheed submitted to EPA, a preliminary draft of report entitled "Preliminary Bulkhead and Demolition Analysis." EPA has not completed its review, however, based on a preliminary review, this report concludes that the existing timber bulkheads, which comprise the majority of overall length of bulkhead at the site, are in a general state of deterioration. Further, the report concludes that these bulkheads have insufficient capacity (even when in good condition) to allow for any dredging near the base of these structures. Lesser lengths of steel sheet pile bulkhead and concrete bulkhead are assessed as being in fair and good condition, respectively. On the basis of the report, implementation of any of the strategies, with the exception of the capping only strategy (Strategy 16), would likely require replacement of at least the existing timber bulkheads. The cost tables attached to the ESD include (conservatively) the same cost for this replacement for all strategies. However, it is likely, the replacement bulkhead for Strategy 1 would be more costly because of the significantly deeper dredge required near the base of the bulkhead than with other strategies.

Lockheed's report also documents an assessment of the condition of the existing timber piling. Approximately 20% of the piling are judged to be in such poor condition as to potentially break during attempted extraction. However, based on information provided in Lockheed's report, if EPA assumed that all pilings needed to be broken or cut off below the mudline and these costs were added to the cost estimate for the selected strategy, Strategy 18C, the cost of Strategy 1 would still be about two times the cost of Strategy 18C. According to Lockheed's report the cost of cutting off approximately 6000 pilings below the mudline would increase the cost of Strategy 18C by about \$785,000 thus increasing the total projected cost for 18C to \$12.764 million. The projected total cost for Strategy 1 is \$23.72 million assuming that all pilings could be simply extracted (less costly than cutting off pilings at the mudline) and that the bulkhead replacement costs (to accommodate very deep dredging) estimated in the ESD are too low. If pilings were cut off at the mudline instead of extracted the projected total cost for Strategy 1 would be \$23.84 million. EPA does not believe that the added cost of significant bulkhead replacement or cutting off pilings offset the cost of deep dredging and the added volume of sediments for disposal. Dredging, disposal of contaminated sediments and capping are the drivers of cost for the Lockheed Shipyard Sediment Operable Unit.

3. Comment 5: Monitoring costs, which can be exceedingly high, may not be as high for Strategy 1. If contaminants in some of the SMU areas can be completely removed, monitoring may not need to be as frequent as it would need to be under the other proposed Strategies. (Washington Department of Fish and Wildlife)

Response to Comment 5: EPA agrees that the long-term monitoring costs for Strategy 1 probably would not be as high as for the other strategies. However, reduction in long-term monitoring costs is not of a sufficient cost savings to justify EPA selecting Strategy 1. Also, refer to Response to Comments 1 and 5.

WATER COLUMN AND HABITAT ISSUES

1. Comment 6: As a decision criterion, the blanket statement that water column loss is equivalent to loss of habitat value is inappropriate. A site specific analysis would be needed to determine whether such water column loss is a negative impact or positive benefit to marine habitat. For example, targeting juvenile salmonid habitat enhancement at this location in Elliott Bay would typically encourage construction of additional habitat at intertidal elevations (-10 to +10 MLLW). If existing bathymetry is raised to increase the extent of such preferential elevations (with attendant loss in water column depth) that action could add significant enhancement to the value of marine habitat at the site. The filling of subtidal or intertidal areas to construct such habitat enhancement should not be automatically counted as a negative characteristic of the remedial strategy. (Todd Pacific Shipyards Corporation, Port of Seattle)

Response to Comment 6: EPA agrees with the above comments. In the ESD, EPA's repeated reference to the need for maintaining the existing bathymetry or water column was meant to refer to the shallow nearshore area of -20 feet MLLW and shallower. Restoring the marine habitat to a more productive environment, a remedial action objective cited in the ROD, could be partially satisfied if future use plans allow for habitat enhancement by construction of additional habitat at intertidal elevations (-10 to +10 MLLW).

2. Comment 7: Any areas in water shallower than -10 feet (MLLW) which must use capping as a remedial strategy should have no net loss of water depth, contours, grades, or profiles (i.e., restore to original bathymetry). Excavations shoreward should balance capping and shoreline stabilization installations that would otherwise fill waterward. (NOAA/NMFS)

Final littoral (-10 to +14 feet MLLW) zone surfaces should have a fish-friendly substrate, as defined by the Washington Department of Fish and Wildlife as "2-inch minus, rounded pit-run gravel". If a shoreline requires large-rock stabilization, it could employ riprap under quarry spall (i.e., "rat-rock") immediate void-filling layer, and top-dressed with a suitable finer-grain "fish mix". (NOAA/NMFS)

Response to Comment 7: The cap design and dredging depth should retain the original bathymetry in the nearshore area shallower than -10MLLW. As noted in the ROD, the cap should be of a smooth surface such as to minimize recontamination by suspended contaminated sediments. Also, the ROD specifies that to the extent

practicable, the marine habitat should be restored to its most productive condition. During design, EPA and Lockheed with consultation with Trustees, resource agencies and Tribes, will pursue designs that enhance the marine habitat as required by the ROD

COORDINATION ISSUES

1. Comment 8: The WDFW agrees with EPA's assessment that the pier decking and piling and shipway removal is necessary in order to effectively remove contaminants from nearshore areas, although the draft ESD states that some piles may need to be left in place to ensure slope stability. The piles will either be cut or broken off below the mud line. When available, WDFW will be interested in reviewing the slope study analysis to determine what factors are primarily responsible for maintaining the slope stability at the site, (i.e., the bulkhead or the pilings). (Washington Department of Fish and Wildlife)

The Tribe is interested in having coordination meetings with EPA regarding the potential timing of the cleanup action. As you are aware, the action that is being proposed involves significant in-water work that could have short-term impacts on Tribal fishing in the area. Therefore, the Tribe is interested in working with you to develop a cleanup approach that avoids impacting Tribal fishing in the area. Cumulative short-term impacts to Tribal fishing could be significant without appropriate communication and coordination. (Muckleshoot)

Response to Comment 8: EPA plans to coordinate remedial design deliverables with Natural Resource Trustees, Tribes and other regulatory agencies. Points for coordination are review and comment on 30% design and 95% design as well as meetings where policy and technical issues can be reviewed and discussed. EPA will contact Natural Resource Trustees, Tribes and resource and other regulatory agencies to decide coordination points that make sense for remedial design.

2. Comment 9: A portion of the former Lockheed property has been transferred to Atlantic Richfield from the Port of Seattle. This parcel is directly adjacent to one of the piers identified for demolition and an area of sediment dredging. Atlantic Richfield would like adequate reassurances that the remedial actions will not compromise the integrity of the shoreline bulkhead in this area. Atlantic Richfield would like to be involved in the design planning/review process to be assured that the selected remedial actions will not impact the terminal or its operations. (TechSolv)

Response to Comment 9: All approved remedial design documents will be available for public scrutiny. Atlantic Richfield is invited to review them and forward any comments or concerns to EPA. EPA is always available to meet concerned neighbors or other citizens regarding remedial action under EPA authority. EPA will not approve any remedial activity it believes may compromise the structural integrity of adjoining or

adjacent property.

BIOACCUMULATION DATA

1. Comment 10: EPA relied on data collected and analyzed by EPA to in part support a No Action Proposed Plan for the West Waterway Operable Unit of Harbor Island. It should be noted that the results and recommendations proposed by EPA as part of the human health risk assessment have been opposed by many parties, including the Muckleshoot Tribe. Therefore, it is not appropriate for EPA to use “risk summaries, characterizations, or recommendations from the West Waterway human health risk assessment” until all concerns about the data are resolved. (Muckleshoot)

Response to Comment 10: EPA relied on risk assessment data developed for the No Action Proposed Plan for the West Waterway Operable Unit (WWOU) of Harbor Island. The human health data evaluated for the WWOU is applicable to the Lockheed Shipyard Sediment Operable Unit. Adverse public comments with supporting information were submitted to EPA opposing its risk assessment determination for WWOU. Presently, EPA is reviewing submitted adverse comments and new information. A ROD is scheduled to be issued by the end of September 2002.

ABRASIVE GRIT BLAST DEFINITION

1. Comment 11: Visual identification of abrasive grit blast (AGB) is a more reliable method for identification at the LSSOU than using physical and chemical criteria. EPA’s criteria for determining AGB may not be applicable to the LSSOU, for the following reasons:

- The specific chemical and physical characteristics of AGB present at the LSSOU are presently unknown. Chemical or physical data presented for the LSSOU were derived from sediment samples collected throughout the site which may or may not have contained AGB. No testing was performed on samples comprised exclusively of AGB.
- A grain size fraction of sand content greater than 60% is not a unique characteristic for the LSSOU. Data collected as part of the Due Diligence Study and Remedial Design Investigation of the LSSOU indicate that the average sand content for the samples characterized is approximately 68%. The average sand content for surface samples is approximately 59% and the average subsurface sample sand content is approximately 82%.
- Relative to the remedial design investigation field observations, EPA’s chemical and physical criteria appear to overestimate the extent of AGB. For example, by EPA’s definition the near-surface materials in the open water area near the north shipway (vicinity of RD-C-04) would be characterized as AGB. Lockheed has not observed any AGB in this area.

Response to Comment 11: EPA has given Lockheed the opportunity to review and comment on the AGB definition and to provide information to support a revision of the definition. EPA and Lockheed have discussed the specific points outlined in Comment 11 at several meetings. To date, EPA has not received any data from Lockheed to substantiate their comments concerning ABG (including Comment 11) nor to modify the EPA AGB definition. The EPA AGB definition itself provides for modification of the definition anytime in the future based on EPA's review and acceptance of rationale or data.

PILE REMOVAL

1. Comment 12: Based on the results of the draft supplemental studies, breaking the piles at mudline rather than complete extraction is more favorable to the remediation of the site because the slope and subsequent cap are expected to be more stable. Breaking the piles at the mudline is expected to be less expensive and reduce the chances for incomplete extraction. (Lockheed)

Response to Comment 12: Lockheed did not provide the supplemental studies to EPA until after the draft ESD was released for public comment. EPA's goal is to remove as many of the piles from the Site as possible while preserving slope and cap stability as well as taking into account future use needs. During the design process, EPA and Lockheed will evaluate methods for determining the number and location of piles that may be completely removed. EPA does not expect that the cost differential between the cost of extraction versus the cost of breaking off a piles below the mudline will be of sufficient difference to justify a reconsideration of the strategy for the Site. Based on preliminary EPA review of the supplemental studies, the cost difference between pulling all the piles and breaking or cutting off all the piles is around \$790,000. However, these technical and cost factors will be evaluated and review and comment will be sought from Trustees, resource and regulatory agencies, Tribes and appropriate experts.

2. Comment 13: WDFW would recommend that EPA require that an analysis be conducted to determine how many piles, and which piles, are truly necessary to be retained to maintain slope stability at the site. Further concerns related to pile retention include the potential for future development at the project site that may require new piling installation. If the retained pilings need to be removed to accommodate new pilings for project development, the integrity of the cap would likely be compromised as a result of the removal operations. Therefore, WDFW recommends that every effort be made to completely remove existing pilings from the marine environment in order to eliminate or reduce the potential for future recontamination at the site. The WDFW also recommends that EPA examine the feasibility of temporarily installing sheetpile or other structures that would maintain the integrity of the slope during cleanup efforts, and minimize the need for leaving potentially thousands of stub pilings in marine waters. Doing this could also eliminate the problem of having to limit the dredge depth

because of slope stability issues and allow more contaminants to be removed at the project site. (Washington Department of Fish and Wildlife)

Response to Comment 13: Once the ESD is final, Lockheed will start preparing the design for the remedial action. The design process will result in several deliverables, 30% design, 95% design and a final design, for review, comment and EPA approval. There are numerous issues to be addressed in remedial design. EPA's goal is to remove as many piles as technically feasible and to minimize recontamination. In order to determine how many piles and which ones can be removed as opposed to broken off below the mudline, an assessment of bulkhead condition, how that contributes to slope stability, the condition of the approximately 6000 piles and future use plans are some of the issues to be addressed. Preliminary information submitted to EPA on January 17, 2002 indicates that the bulkhead is in varying stage of poor condition and may not by itself be supporting the uplands portion of the Lockheed site. If the presence of the pilings are providing support for slope stability, Lockheed will need to analyze various alternatives about which pilings remain to be broken off at the mudline and which ones are pulled. That analysis should also consider future use plans including the placement of future concrete piles to the extent that that information is available. Regarding piles that are left in place or for future construction activities occurring in the capped area, institutional controls will direct the manner in which piles are pulled or installed in the future and controls to be put in place to minimize release of contamination.

Temporary and permanent support structures such as sheet piling shall be considered in various dredging alternatives. The dredge depth for the under-pier, enclosed water and shipway areas will be based on the thickness of the cap or habitat considerations. Refer to Response to Comment 4 for more information about the cost.

3. Comment 14: DNR understands that EPA concurs with our long standing assertion that any cap design needs to accommodate deep burrowing benthic fauna by providing adequately clean, fully functional habitat greater than 3 feet in thickness. (Department of Natural Resources)

Response to Comment 14: Cap design will take into account numerous objectives and specifications. Some of the cap design objectives include that the cap shall be physically and chemically confining of the contaminated sediment and that according to the ROD "(t)o the extent practicable, the marine habitat ... must be restored to its most productive condition...". DNR will have the opportunity to comment on the cap design at the 30% and 95% design stages.

FUTURE USE

1. Comment 15: It should be noted that the aquatic area of this site is also part of the Muckleshoot Indian Tribe's Usual and Accustomed Fishing Grounds. Institutional

controls that do not interfere with future uses nor Tribal Treaty fishing are needed to ensure that the integrity of the cap is not compromised (NOAA/NMFS, Muckleshoot Tribe).

Response to Comment 15: EPA will coordinate with the Muckleshoot Tribe, as with other interested parties, when discussions on future use and institutional controls are held for the site. These considerations will be taken into account during review of remedial design documents.

2. Comment 16: Future site use(s) should include use of non-treated structures to eliminate the potential for leaching creosote into the environment. (Department of Natural Resources)

Response to Comment 16: Future site development, such as the nature and installation of new piles, will be subject to appropriate Best Management Practices (BMP).

3. Comment 17: DNR continues to be concerned about the long-term liability the state may incur by having a cap on State Owned Aquatic Land. DNR is interested in ensuring that options for productive beneficial use of SOAL are preserved. DNR is therefore concerned about the institutional controls that might be placed to ensure the integrity of a cap; DNR wants to ensure that those controls and the presence of a cap do not constrain future use of the land. (Department of Natural Resources)

Response to Comment 17: The institutional controls that will be placed to preserve the integrity of the cap will not prohibit future uses but they will likely direct how certain activities are carried out. DNR will have the opportunity to review and comment on design plans.

4. Comment 18: The ESD provides that future site uses be considered during remedial design, however, incorporation of the Port's future use plans seems impossible without specific future use plans. What will be the process for incorporating future uses plans in remedial design and how will that affect the schedule for remedial design. EPA should include a provision in the ESD for post-demolition administrative protection of existing over-water coverage for future site plans. (Lockheed)

Response to Comment 18: The Port of Seattle is the owner of the former Lockheed facility. EPA fully expects that Lockheed and the Port will coordinate design discussions and plans to take into account the Port's future use plans. EPA will consider future use as part of the remedy design and implementation as appropriate at the OU.

SOURCE CONTROL

1. Comment 19: We prefer inclusion of source control through plugging or removing adjacent pipes as they may contain suspected sources of contaminants. (Department of Natural Resources)

Response to Comment 19: EPA will evaluate source control documents to be prepared by Lockheed to ensure that uplands surface water (including stormwater) or groundwater does not recontaminate the cap. A number of options for source control will be evaluated if source control is needed. The final determination of the form of source control will be documented in either the Consent Decree for Remedial Action or the final remedial design document.

2. Comment 20: Based on the Seattle Yard 1 groundwater evaluation, the recontamination potential from the adjacent upland is expected to be low. We believe EPA has reviewed this evaluation and agrees with its findings. (Lockheed)

Response to Comment 20: EPA has conducted a preliminary review of the groundwater evaluation but has not finalized its evaluation of this potential source of contamination.

DISPOSAL

1. Comment 21: The Tribe supports EPA's proposal to dispose of all contaminated dredge materials from the open water, under-pier, shipway, and enclosed areas in an appropriate upland landfill. (Muckleshoot Indian Tribe)

NOAA's preference is complete removal of contaminated sediments with non-aquatic disposal. (National Oceanic and Atmospheric Administration)

Response to Comment 21: Several commentors provided written comments supporting upland disposal. No commentors objected to upland disposal or noted a preference for another form of disposal.

