



Technical Assistance Services *for Communities* Portland Harbor Superfund Site Record of Decision – Review of Community Concerns April 2017

Contract No.: EP-W-13-015

Task Order No.: 18

Technical Directive No.: R10 #2.2.2 Portland Harbor

Portland Harbor Record of Decision Review of Community Concerns

Introduction

The Portland Harbor Community Advisory Group (CAG) initially requested the U.S. Environmental Protection Agency’s (EPA’s) Technical Assistance Services for Communities (TASC) program to conduct a technical review of the Portland Harbor Record of Decision (ROD). The purpose of the request was to help them understand the decisions in the ROD and more specifically how community concerns and comments were addressed. To better understand the Portland Harbor community’s concerns and comments, TASC technical advisors reviewed commenter files shared by EPA and community group representatives. TASC also consulted with Portland Harbor community group representatives by conference call and email.¹

This document summarizes how EPA addressed community concerns shared during the public comment period in the ROD. Through reviewing commenter files and consulting with community representatives, TASC identified six primary community concerns. This document is organized by these six primary concerns, as shown in the table of contents on the next page. Specific comments from the technical advisors, including future opportunities for public engagement as part of the Superfund process, are also noted in the document in “Technical Advisor Comment” boxes.

This is not an EPA document. Independent consultants from EPA’s TASC program produced this document. The contents do not necessarily reflect the policies, actions or positions of EPA. The ROD is a final document, and comments provided in this review are for the community’s reference and will not affect the ROD.

¹ TASC met with representatives from the following organizations on a conference call on February 9, 2017: Audubon Society of Portland, Portland Harbor CAG, Portland Harbor Community Coalition and Willamette Riverkeeper. TASC also corresponded with representatives of the Sauvie Island community, League of Women Voters of Portland and the Right 2 Survive group via email.

Table of Contents

About the Record of Decision	3
Primary Concern 1. Modifications to the cleanup alternative that would support enhanced cleanup.....	3
Community Concern 1.1: How does the selected remedy address shoreline remediation and habitat restoration?..	6
Community Concern 1.2: To what extent are dredging, monitored/enhanced natural recovery and capping part of the selected remedy?	7
Community Concern 1.3: What is the status of the confined disposal facility (CDF) at Terminal 4?	9
Community Concern 1.4: How are innovative technologies being used?	9
Community Concern 1.5: How are fish consumption goals established and protective of people and the environment?	9
Primary Concern 2. Validity of the nine evaluation criteria outcomes used to select the cleanup alternative	11
Community Concern 2.1: Is the selected alternative protective of human health and the environment?.....	11
Community Concern 2.2: How was community and state acceptance determined?	11
Community Concern 2.3: Is the amount of time allocated for cleanup appropriate?	13
Community Concern 2.4: How is short-term effectiveness considered in the ROD?	13
Community Concern 2.5: How is cost effectiveness considered in the ROD?	13
Primary Concern 3. How environmental justice issues are addressed	14
Community Concern 3.1: What are the environmental justice considerations in the Proposed Plan and ROD?....	14
Community Concern 3.2: What opportunities are available for public engagement during the cleanup process? ..	15
Community Concern 3.3: How was cultural awareness considered in the selection of cleanup alternatives - specifically in the selection of institutional controls?.....	15
Community Concern 3.4: How will public access to the river be provided?	17
Community Concern 3.5: How will the remedy support local jobs and hiring practices?	18
Community Concern 3.6: How were source control concerns and cumulative risks addressed?.....	18
Primary Concern 4. The extent of monitoring and investigations.....	19
Community Concern 4.1: How will monitoring be standardized before, during and after cleanup?	19
Community Concern 4.2: Will monitoring data be available in a public database and as part of a data management plan?	21
Community Concern 4.3: How does the ROD address chemical air volatilization of PCBs and other COCs?.....	22
Community Concern 4.4: How will EPA monitor and mitigate remedy construction impacts on the community such as sound, light, diesel emissions and odors?	23
Community Concern 4.5: How will progress toward remedy success be tracked, and what is the contingency plan if criteria are not met?.....	24
Primary Concern 5. How does the ROD align with federal, state and local policies?	25
Community Concern 5.1: How does the ROD address federal Clean Water Act and Oregon Water Quality Standards?.....	25
Community Concern 5.2: How does the ROD meet the requirements of the Oregon Health Authority's fish consumption standards?.....	26
Primary Concern 6. What are the potential human health effects before and after the cleanup?.....	27
List of Acronyms	28
Technical Assistance Services for Communities Contact Information	29

About the Record of Decision

On June 8, 2016, the U.S. Environmental Protection Agency (EPA) released the Remedial Investigation (RI) Report, the Feasibility Study (FS) Report and the Proposed Plan for the cleanup of the Portland Harbor site (the Site). The FS Report evaluated nine possible alternatives for cleanup, based on the type and extent of contamination identified during the RI. The Proposed Plan presented EPA's preliminary recommendation for how best to address contamination at the Site.

On January 2017, after the public comment period on the Proposed Plan, EPA issued the Site's ROD. A ROD is the primary decision document for a National Priorities List Superfund site. The ROD sets forth EPA's selected remedy for a site and the reasons for its selection. The Site's ROD describes the remedial alternatives for a 10-mile reach of the lower Willamette River, covering nearly 2,190 acres downstream of downtown Portland. The ROD addresses 64 contaminants of concern (COCs) at the Site, with most human health and ecological dietary risks attributed to polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), polychlorinated dibenzo-*p*-dioxins and furans (dioxins and furans), and pesticides such as dichlorodiphenyltrichloroethane (DDT). The ROD focuses primarily on addressing these four COCs to achieve cleanup goals.

The ROD includes EPA's responses to community questions and concerns and how they were addressed in the selection of the remedy, called a responsiveness summary. The complete ROD is available for download on EPA's website:

<https://yosemite.epa.gov/R10/CLEANUP.NSF/ph/Portland+Harbor+Superfund+Site>.

The ROD does not mention orphan sites, where contamination is left on a property but the former business is no longer operating or has insufficient funds to address cleanup. However, both EPA and Oregon Department of Environmental Quality (DEQ) have resources to identify and clean up orphan sites. These agencies could be consulted for any questions related to orphan sites. Similarly, the ROD states that EPA did not consider bonds, funding, liability or insurance in the ROD. However, EPA states in the ROD that it will follow the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) guidance to locate and hold accountable all relevant potentially responsible parties (PRPs) to support the cleanup process.

Primary Concern 1. Modifications to the cleanup alternative that would support enhanced cleanup

The FS included nine alternatives (A through I) for cleanup at Portland Harbor. The Proposed Plan identified Alternative I as the preferred alternative. Community members who requested this summary primarily requested Alternative G with modifications. The ROD identified Alternative F Modified as the selected alternative. In part, revisions were based on public comments. The text box on the following page summarizes its components.

Alternative F Modified was not included in the original FS. It is an intermediate alternative that lies between Alternatives I and G in terms of the extent of contamination that will be cleaned up. The ROD states that Alternative G would take longer, cost more and have greater short-term impacts on the community and area ecosystems. For example, Alternative G would require more trains or barges to transport low-level contaminants, resulting in more potential for traffic and an increased risk of spills.² Table 1 provides a comparison of the components of Alternative I, Alternative F Modified and Alternative G. Community questions about the selected remedy and responses to the questions follow the table.

Alternative F Modified – Cleanup Components

Capping: EPA and contractors will place clean material on top of more-contaminated sediment, capping it in place. In general, contaminants will be capped with three feet of clean sediment.

Reactive Caps: EPA will embed reactive amendments in the capping material, where needed. These amendments consist of materials such as activated carbon that are similar to charcoal. They chemically trap and store chemicals so they are not released into the river.

Monitored Natural Recovery (MNR): This approach refers to the passive burial of low-level contamination by the downstream movement of sediments from upstream. According to EPA, MNR will not be used in areas with principal threat waste (PTW) or high levels of contamination. The ROD acknowledges that MNR alone “has not been shown to be effective on its own to address some of the most highly contaminated areas” (Section 2-5 of the ROD’s Responsiveness Summary).

Enhanced Natural Recovery (ENR): Clean material with reactive amendments such as activated carbon will also be placed on areas with low-level contaminants.

In-situ: Includes treatment of contaminants where they are currently located using chemical, physical or biological technologies. In-situ technologies may be used where contaminated groundwater continuously adds contaminants to the sediment or where waste levels are higher and could create more risk if sediment is disturbed.

Ex-situ: Ex-situ treatment would involve the application of chemical, physical or biological technologies after waste is removed. Treatments include low level heating or stabilizing the contaminants to keep them from leaving the waste repository.

² U.S. Environmental Protection Agency. 2017. ROD, Portland Harbor Superfund Site, Responsiveness Summary 2-194.

Table 1. Summary of Alternatives I, F Modified and G³

Alternative	Alternative I	Alternative F Modified	Alternative G
Capping, dredging and ENR	291 acres of sediment 19,472 linear feet of river bank	394 acres of sediment 23,305 linear feet of river bank	776 acres of sediment 26,362 linear feet of river bank
Acres of MNR	1,876	1,774	1,391
Acres of reactive caps	64	83	101
Amount of contaminated sediment disposed of (cubic yards)	1,752,374	3,017,189	7,396,598
Number of eight-ounce fish meals safe to consume in a year	General members of the public: 13 Children: 12 Mothers breastfeeding an infant(s): 0.7	General members of the public: 16 Children: 14 Mothers breastfeeding an infant(s): 1	General members of the public: 26 Children: 24 Mothers breastfeeding an infant(s): 2
Will river water be safe for contact recreation?	Yes	Yes	Not for PCBs
Percent of contaminated river banks addressed with cleanup	65%	78%	88%
Acres of habitat restoration (mitigation)	35	60	86
Percent of groundwater cleaned up (RAO ⁴ 4) ⁵	33%	39%	62%

³ ROD Table 22.

⁴ Remedial Action Objective.

⁵ Reduce migration of COCs in groundwater to sediment and surface water such that levels are acceptable in sediment and surface water for human exposure.

Community Concern 1.1: How does the selected remedy address shoreline remediation and habitat restoration?

The ROD mentions several opportunities for habitat restoration and shoreline remediation as part of the remedy and required habitat mitigation.

*Mitigation:*⁶ Habitat mitigation is the restoration of habitat in another area if habitat on site is lost due to remedy construction. Alternative F Modified will require 60 acres of habitat restoration. A final assessment of mitigation requirements will take place during the remedial design phase. Any mitigation project would be planned for the Lower Willamette or Columbia Rivers, with a preference for projects located as close as possible to impact areas. Federal and state policies will guide the amount and type of habitat mitigation required. Section 404 of the federal Clean Water Act and State of Oregon mitigation regulations support an alternative evaluation process to avoid loss. If impacts are unavoidable, mitigation is required.⁷

EPA also must comply with the Endangered Species Act Section 7 consultation and draft biological assessment (BA). A preliminary programmatic BA was developed as part of the Site's FS and Proposed Plan, and coordination with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) has begun. The goal of the BA is to understand potential construction impacts on threatened or endangered species and critical habitat. The BA could include best management practices (BMPs) and habitat mitigation. The BA will be updated as needed during the remedial design phase.⁸

Some community members asked if the Federal Emergency Management Administration's (FEMA) National Flood Insurance Program (NFIP) biological opinion was considered. EPA stated in the ROD that biological opinion is not relevant as it relates to flood insurance and is outside EPA purview. However, the remedy must meet FEMA 44 CFR⁹ 9 for floodplain management and protection. Where impacts are unavoidable, compensatory mitigation could

Potential Habitat Restoration Projects

Dredged and capped areas will be covered with a clean layer of beach mix sediment (less than 2.5 inches in diameter) to support habitat.

Shallow water habitat will be restored after dredging.

Revegetation of riverbanks will occur on riverbank caps and channel areas not exposed to erosion. Plants will include willows, cottonwood and other native species.

Logs will be placed in and along the river to restore habitat for fish and invertebrates.

⁶ Responsiveness Summary 2-61.

⁷ State of Oregon Administrative Rules addressing mitigation include 141-485-510, 141-085-680, 141-085-0685, 141-085-0690, 141-085-0710 and 141-085-0715.

⁸ ROD Sec. 15.2.2.

⁹ Code of Federal Regulations.

include conversion of upland habitat to shallow water, decreasing bank angles, vegetating banks and reconnecting the river to off-channel habitats to support fish and invertebrate habitat.

Technical Advisor Comment

The community could ask EPA about opportunities to provide input into project selection for future mitigation projects. Community members could ask EPA to work with the community on the selection criteria for mitigation projects, and then work with the community on a list of potential mitigation projects.

The State of California is currently conducting outreach to support mitigation projects in several environmental justice communities:
<http://www.dtsc.ca.gov/GetInvolved/SEP/SEPs.cfm>. A similar process could ensure that the mitigation projects directly benefit the parts of the lower Willamette River that are most affected.

Community Concern 1.2: To what extent are dredging, monitored/enhanced natural recovery and capping part of the selected remedy?

Table 1 identifies the extent to which these components are part of the selected remedy.

Capping: Caps – a layer of clean material three feet deep – will be placed on top of contaminated sediment in some areas to stop contaminants from moving into the surface water. In some cases, large rocks will be placed on top of the caps to prevent movement during storms or other hazard events. The ROD states that reactive caps with activated carbon will be used to bind contaminants in place in some areas. The binding that occurs is typically irreversible.¹⁰ The design will account for frequent flooding, climate change, vessel wakes and erosion created by boat propellers.¹¹

Dredging: Dredging will be accomplished using environmental closed buckets to reduce the chance of contaminants being released into the river and will be conducted from the shoreline either while sediment is submerged in the river or along dry riverbanks. The ROD states that the final method for dredging will be determined during the design phase.¹² Part of the reason for uncertainty in the type and amount of dredging is due to the lack of data on the depth of existing contamination. Dredge depths will be determined during the design phase. EPA assumed a maximum depth of 15-19 feet in the navigational and intermediate regions and five feet in the shallow zones. If contamination greater than the Remedial Action Levels continues below this depth, EPA plans to cap the remaining contamination.

MNR:¹³ The ROD acknowledges that the success of MNR will depend on active remediation of hotspots and cleaner upstream sediment, which will occur faster in depositional areas. The ROD also states that MNR alone is not expected to protect human health and the environment. The

¹⁰ Responsiveness Summary 2-83.

¹¹ Responsiveness Summary 2-83.

¹² ROD p.62.

¹³ Responsiveness Summary 2-98.

ROD assumes that some COCs will degrade over time and that MNR will only be used for less-contaminated areas that cover 82 percent of the Site. The ROD notes the dynamic and transitional nature of the Willamette River, citing deposition rates from a 2002-2009 bathymetric survey plus grain-size analysis of surface and subsurface ratios.

The ROD also notes that the mechanisms of MNR are not yet known and that the hydrodynamic sediment model developed by the Lower Willamette Group (LWG)¹⁴ is not a relevant tool for predicting the success of MNR because the model over-predicts sediment deposition. According to an external review by Portland State University and the U.S. Army Corps of Engineers, the model also did not take into account bedload transport and sediment loading, rain-on-snow flooding, and the full extent of a 100-year flood.¹⁵ Because of these uncertainties, the model was not used during the evaluation of the cleanup alternatives. EPA acknowledged a need for long-term monitoring of MNR progress in the ROD, including monitoring sediment, surface water and fish tissue. Uncertainty also exists in degradation of heavy metals and other COCs as well as the impacts of flood events and boats on MNR. If EPA finds that MNR is not effective, the Agency may consider other options.

ENR: ENR may be used in areas where MNR is not achieving the desired results in the established cleanup timeline. ENR will not be used in areas where erosion is common. ENR includes placing a thin, 12-inch layer of sand over the contamination, which could help dilute the contaminants and reduce exposure to fish and their prey. Activated carbon will be added to the sand where principal threat waste, highly mobile or toxic sources of contaminants, occurs. For example, the RI noted that MNR may not be progressing at Swan Island Lagoon. As noted in the ROD, EPA may consider ENR for this area.

Technical Advisor Comment

Appendix C of the FS provides details on a multi-criteria evaluation for understanding benefits of various technology types. The evaluation includes sediment erosion and deposition, shallow water depth, sediment bed slope, debris and structures like pilings. The evaluation looked at technologies assuming river flows were based on levels that occur about every two years or about 156,000 cubic feet per second (cfs). According to data in the Appendix, a ten-year flow reaches 252,000 cfs and a 25-year flow reaches 297,000 cfs. Given the long-term nature of the remedy, a 25-year or 50-year flow may be more appropriate to ensure the technology is protective. Additionally, increases in storm intensity from climate change and rising sea levels could affect the remedy and downstream transport of contaminants.

The community could ask EPA for the rationale behind using a two-year storm event for assessing technology effectiveness. The community could also ask for more details on the approach EPA will use to embed changes in flows and sea levels due to climate change into remedy design and construction.

¹⁴ The Lower Willamette Group is a group of some of the potentially responsible parties identified by EPA. The LWG signed an agreement to conduct the remedial investigation and feasibility study at the Portland Harbor Superfund site.

¹⁵ Responsiveness Summary 2-102.

Community Concern 1.3: What is the status of the confined disposal facility (CDF) at Terminal 4?

The ROD states that a CDF would reduce the number of trips for waste transport and disposal by keeping waste on site. However, based on public input and the Port of Portland’s withdrawal of a potential CDF location, EPA did not select the use of a CDF in the ROD. The ROD selected off-site waste disposal instead. A certified hazardous waste handler will manage the waste, decreasing long-term maintenance costs.¹⁶

Community Concern 1.4: How are innovative technologies being used?

The selected remedy proposes using capping, dredging, in-situ and ex-situ treatment, ENR/MNR, and institutional controls.¹⁷ Figure 28 in the ROD is a decision tree for remedial technologies to be used at the Site. Superfund cleanup guidance supports the use of innovative technologies as long as they are more effective than selected treatment options, create fewer or less negative impacts than those of other approaches, and have lower costs while being as effective as selected options.¹⁸ According to the ROD, additional technologies can be included in the cleanup if they are shown to be effective and are approved by EPA.

Technical Advisor Comment

The decision tree for technology screening in the ROD focuses on dredging and capping. Section 2.4 of the FS Report describes the technology screening process more broadly. The community could ask EPA how other technologies could fit into the decision tree structure. The community could also ask EPA to discuss the process for vetting other innovative technologies and opportunities for community involvement during that process.

Community Concern 1.5: How are fish consumption goals established and protective of people and the environment?

EPA received nearly 3,000 responses during the public comment period asking that the cleanup result in fish being safe to eat, without restrictions, for any population.¹⁹ The ROD provides several examples of expected changes in fish consumption safety because of cleanup. EPA’s risk assessment looked at cancer and non-cancer risk based on maximum exposure and included subsistence and tribal fishers in its analysis.²⁰ The ROD states that, after 13 years, EPA expects 85 percent of fish consumption risk to be addressed.²¹ The ROD also notes that other factors can affect fish consumption risk, such as contributions of pollutants from the watershed and upstream, including mercury, which is not part of the cleanup.²² According to the ROD, the remedy “addresses all risks to ecological receptors from eating fish,” but notes that upstream

¹⁶ Responsiveness Summary 2-89.

¹⁷ ROD p.i.

¹⁸ Responsiveness Summary 2-93.

¹⁹ Responsiveness Summary 2-27.

²⁰ Responsiveness Summary 2-27.

²¹ Responsiveness Summary 2-11.

²² Responsiveness Summary 2-29.

background levels currently exceed acceptable PCB levels for fish consumption for subsistence.²³

EPA developed fish consumption rates using data taken from published studies, including rates from tribal communities and subsistence fishers, in the Portland Harbor area.²⁴ Data were based on continuing surveys of food intake by individuals and creel surveys in the Columbia Slough. Based on these studies, EPA created three categories of fish consumption:

- Recreational: two eight-ounce meals per month
- Higher-end recreational: 6.5 eight-ounce meals per month
- Subsistence: 19 eight-ounce meals per month

EPA noted that the studies estimate that tribes along the Columbia River consume about 23 eight-ounce meals per month of fish, a larger amount than the value placed on subsistence fishing. The basis for the lower value relies on the difference between resident and migratory fish consumption. The ROD states that 50 percent of fish consumed by tribal communities are resident, with the other 50 percent being migratory. The ROD states that existing Oregon Health Authority (OHA) fish advisories apply to all resident fish. This does not include migratory fish such as salmon and lamprey because they do not spend enough time in the habitat to bioaccumulate contaminants from the Site.²⁵ Because some of the fish consumed by tribal communities are migratory, EPA used a lower value to estimate the amount of fish consumed by subsistence fishers.

During construction of the remedy, EPA will provide additional fish advisories, as appropriate, as sediment disturbance occurs. During this period, EPA anticipates recommending no more than 0.6 fish meals per year or 4.8 ounces a year for everyone except breastfeeding women. EPA recommends 0.1 fish meals per year or 0.8 ounces a year for breastfeeding women. After remedy construction, 16 eight-ounce meals a year for adults and one eight-ounce meal per year for breastfeeding women are expected to be acceptable.²⁶

Following construction, EPA will monitor fish tissue and fish tissue surrogates until cleanup levels are met. EPA will use target concentrations for contaminant levels in fish to measure progress towards RAOs 2 and 6 (consumption of fish by people and wildlife), inform fish advisories, evaluate construction impacts, and update best management practices and institutional controls. The target concentrations are a tracking tool rather than cleanup levels – if they are not achieved, EPA will reevaluate the remedy.²⁷

²³ Responsiveness Summary 2-27.

²⁴ Responsiveness Summary 2-123.

²⁵ Responsiveness Summary 2-27.

²⁶ Responsiveness Summary 2-27.

²⁷ Responsiveness Summary 2-35.

Primary Concern 2. Validity of the nine evaluation criteria outcomes used to select the cleanup alternative

EPA screens the remedial technologies and process options based on three performance criteria (effectiveness, implementability and cost) as prescribed in the Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA.²⁸ Following preliminary screening, EPA determines whether to retain the process options for assembly into remedial alternatives. EPA screens remedial technologies based on nine standardized criteria: 1) overall protection of human health and the environment; 2) compliance with applicable or relevant and appropriate requirements (ARARs); 3) long-term effectiveness and permanence; 4) reduction of toxicity, mobility and/or volume of hazardous constituents; 5) short-term effectiveness; 6) implementability; 7) cost; 8) state acceptance; and 9) community acceptance.²⁹

The first two criteria must be met for an alternative to be considered for selection. Each of the nine cleanup alternatives evaluated included capping waste, removing waste, treating waste at the Site (in-situ), treating waste after removal (ex-situ), MNR/ENR and institutional controls.

The ROD states that additional removal of contaminated sediment beyond what is in the selected alternative “would not substantially improve public health and environmental protection but would take a good deal longer; cost substantially more; have greater short-term impacts to aquatic organisms in the waterway and to the community surrounding the waterway because of dredging activity; and require the processing, transporting, and landfilling of millions of additional cubic yards of sediment with low levels of contamination.”³⁰ An uncertainty analysis was conducted as part of the FS (see the FS Report, Appendix I). It was not updated to include the modified version of Alternative F.³¹

Community Concern 2.1: Is the selected alternative protective of human health and the environment?

As identified in the Proposed Plan and summarized in the ROD, the most permanent alternatives are, in decreasing order: G, F, F Mod, E, I, D and B. Alternative F Modified is more protective of human health and the environment than Alternative I because the more-contaminated sediment removed through dredging provides a more permanent solution and is more protective. The ROD notes that alternatives with fewer institutional controls are likely to be considered more protective.

Community Concern 2.2: How was community and state acceptance determined?

EPA received input from more than 5,300 different respondents during the public comment period. About 88 percent of the responses expressed concern that the preferred alternative (Alternative I) identified in the Proposed Plan did not go far enough to address contamination at the Site. Commenters were concerned that more than 85 percent of the site area would not be

²⁸ EPA. 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. <http://rais.ornl.gov/documents/GUIDANCE.PDF>.

²⁹ 42 U.S.C. 103 Comprehensive Environmental Response, Compensation and Liability Act.

³⁰ ROD, Responsiveness Summary 2-3.

³¹ Responsiveness Summary 2-69.

addressed by an active remedy, with MNR relied on to achieve cleanup goals. Table 1 summarizes the changes made to the Proposed Plan’s preferred alternative based on public comments.

In the ROD, EPA included a letter in Appendix V stating that the Oregon Department of Environmental Quality has concurred with Alternative F Modified.³² Specifically, DEQ supports the selected alternative with the following preferences:

- EPA provides administrative and legal financial incentives for PRPs to move forward with performance agreements.
- EPA supports innovative technologies during the cleanup.
- A long-term monitoring plan and data management system should be implemented.
- EPA should implement an updated fish advisory plan and outreach program.

Table 2. Summary of Site Remedial Alternatives (Table 23 of the ROD)

Remedial Alternative	Description ⁽¹⁾	Threshold Criteria		Balancing Criteria				
		Overall Protection of Human Health and the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, or Volume through Treatment	Short-Term Effectiveness	Implementability	Present Value Cost (Dollars)
A	No Action/No Further Action	—	—	NA	NA	NA	NA	NA
B	Dredge/Cap 95 acres; ENR 100 acres MNR 1,966 acres; In-situ 7 acres Ex-situ 191,573 cy; Disposal 627,652 cy	—	—	○	○	◐	●	\$
D	Dredge/Cap 177 acres; ENR 87 acres MNR 1,900 acres; In-situ 3 acres Ex-situ 191,573 cy; Disposal 1,181,238 cy	+	+	◑	◑	◑	◑	\$
E	Dredge/Cap 269 acres; ENR 60 acres MNR 1,838 acres; Ex-situ 191,573cy; Disposal 2,024,222 cy	+	+	◑	◑	◑	◑	\$\$
F Mod	Dredge/Cap 365 acres; ENR 28 acres MNR 1,774 acres; Ex-situ 191,573 cy; Disposal 3,017,189 cy	+	+	◑	◑	◑	◑	\$\$\$
F	Dredge/Cap 505 acres; ENR 28 acres MNR 1,634 acres; Ex-situ 191,573 cy; Disposal 4,585,401 cy	+	+	◑	◑	◑	◑	\$\$\$
G	Dredge/Cap 756 acres; ENR 19 acres MNR 1,391 acres; Ex-situ 191,573 cy; Disposal 7,396,598 cy	+	+	●	●	○	○	\$\$\$\$
I	Dredge/Cap 231 acres; ENR 60 acres MNR 1,876 acres; Ex-situ 191,573 cy; Disposal 1,752,374 cy	+	+	◑	◑	◑	◑	\$\$

³² Responsiveness Summary 4-2.

Community Concern 2.3: Is the amount of time allocated for cleanup appropriate?

The ROD identifies two factors that impact the amount of time needed to complete the cleanup process.³³ The first factor is salmon migration limits, which restrict in-river construction activities to between July 1 and October 31. The second factor is the heavy usage of Portland Harbor by other boat traffic, which limits the number of barges EPA can use for cleanup at any one time.

Community Concern 2.4: How is short-term effectiveness considered in the ROD?

To assess short-term effectiveness of the cleanup, EPA looked at human use, recreation, commercial and subsistence fishing, water recreation, aesthetics, and riverside parks. Additional evaluation is ongoing. Longer cleanup times are given a negative weighting in the short-term effectiveness evaluation because of the extended impacts on businesses and area communities. As a result, Alternative F and F Modified were given higher weightings for short-term effectiveness because they require less construction time. Construction could impact businesses and send some contaminants into the river in the short term.

Community Concern 2.5: How is cost effectiveness considered in the ROD?

In the ROD, EPA notes that the cost-effectiveness of a remedy is linked to a combination of short-term effectiveness, long-term effectiveness and reduction in toxicity or migration of contaminants.³⁴ The factors that generally are not required to meet cost-effectiveness criteria, in most cases, are protection of human health and the environment and compliance with ARARs. EPA notes in the ROD that it is not required to use a quantitative assessment of cost-effectiveness, but rather it uses an informed comparison of the cost of each alternative in relation to short and long-term effectiveness and reduction in toxicity of contaminants.³⁵

As an example of this evaluation from the ROD, EPA determined Alternative A was not protective; Alternative B would not be able to meet ARARs; and Alternatives B and D do not contain the contaminants effectively. These are examples of where the protectiveness of the remedy screened out alternatives, even if they had reduced costs. Alternatives F and G were also screened out, even though they would have removed the greatest amount of contamination. EPA determined the short-term impacts of removing larger amounts of sediment would have a greater impact on the fishery habitat, to business and to the community in the short term, during the nearly 19 yearlong cleanup. EPA determined that the effectiveness of alternative F Modified was proportional to the cost of the remedy.

³³ Responsiveness Summary 2-11.

³⁴ Responsiveness Summary 2-151.

³⁵ Responsiveness Summary 2-151.

Technical Advisor Comment

As noted in the ROD, the cost effectiveness analysis is qualitative. The information presented in the ROD does not provide enough information to understand how EPA made a comparative analysis of cost-effectiveness. With existing information, the cost effectiveness evaluation could include a visual summary, which could help the community better understand the balance between cost-effectiveness and remedy selection. The community could ask EPA for a graphic comparing cost of the alternative to the level of expected achievement for each RAO. Doing so would provide the community with more information regarding the balance between cost and final cleanup expectations.

The selected alternative, F Modified, would allow general members of the public and children to consume 10 fewer fish meals a year than Alternative G. An additional component of cost-effectiveness could include the economic value of supporting greater access to fish in the community and to commercial fisheries.

Primary Concern 3. How environmental justice issues are addressed

Community Concern 3.1: What are the environmental justice considerations in the Proposed Plan and ROD?

EPA took the following approaches to address environmental justice considerations as part of the development of the Site's Proposed Plan and ROD. EPA used EJSCREEN, an online mapping tool, to identify locations of environmental justice impacts based on socioeconomic characteristics and levels of air and water pollution. EPA also used the C-FERST tool to model and understand the impacts of air pollution on communities.

EPA then took six actions focused on environmental justice during the development of the Proposed Plan and the ROD. These actions included:

- Identifying impacted communities within a 2.5-mile radius of the Site.
- Considering possible public health exposures and cumulative exposures.
- Attending Oregon Environmental Justice Task Force meetings and holding four public meetings in multiple languages.
- Participating in public participation strategies, including workshops, ethnic festivals, children's festivals, Earth care summits, boat tours and presentations to the Native American community.
- Providing focus groups, a Technical Assistance Grant (TAG) to support technical assistance services and environmental justice training for the Site's Community Advisory Group (CAG).
- Seeking tribal representation.

Community Concern 3.2: What opportunities are available for public engagement during the cleanup process?

During the cleanup process, there are several opportunities for public engagement. The public can continue to provide comments to EPA. Additionally, EPA must update the Site's Community Involvement Plan (CIP) before the remedial design phase. EPA will conduct additional interviews with community members about their perspectives on community engagement and outreach to inform the updated community involvement plan and further public engagement efforts at the Site.

Technical Advisor Comment

Community members asked several questions about public engagement that lie outside of the general cleanup process. The examples below provide strategies that community members could take to address some of their concerns that may not fit into the Superfund cleanup process.

One example is EPA's *Ports Primer for Communities and Community Action Roadmap* (<https://www.epa.gov/ports-initiative/draft-ports-primer-communities>). This tool provides a process and case studies of how communities can engage in decision-making and quality of life questions near ports.

A second example is the ReGenesis project in Spartanburg, South Carolina. Community members used an initial \$20,000 grant from U.S. EPA to establish an environmental justice partnership with the city and county governments to promote equitable development. Through the partnership, ReGenesis identified community priorities, leveraging \$270 million in revitalization and neighborhood investment, including affordable housing, green energy investments and collaborative agreements with industry. More information is available here: <https://blog.epa.gov/blog/2015/07/a-promise-fulfilled-environmental-justice-at-work-in-spartanburg-sc>.

Community Concern 3.3: How was cultural awareness considered in the selection of cleanup alternatives - specifically in the selection of institutional controls?

As part of the ROD, EPA recognized that fish advisories and warning signs may not be sufficiently informing the public about risks at the Site.³⁶ There are two major opportunities for further public engagement regarding fish advisory signage and education – the Site's Institutional Control Implementation and Assurance Plan and outreach efforts by EPA.

The PRPs are responsible for developing an Institutional Control Implementation and Assurance Plan, which EPA will review. The goals of the plan are to:³⁷

- Establish and document activities needed to implement and ensure long-term stewardship of institutional controls.

³⁶ Responsiveness Summary 2-190.

³⁷ Responsiveness Summary 2-190 - 191.

- Identify roles and responsibilities for implementation.

EPA will work with river users, property owners, communities and others to minimize long-term impacts of institutional controls. The ROD also provided a list of possible activities to support compliance with fish consumption advisories, develop outreach programs and track effectiveness of the fish consumption advisories. Potential actions include:³⁸

- Conducting a survey of all vulnerable and subsistence uses of fish.
- Determining effectiveness of monitoring.
- Developing and implementing a fish tissue sampling plan for before, during and after remediation. EPA states it will use the data in five-year reviews and as metrics to assess progress towards meeting RAOs.
- Implementing fish advisories before, during and after cleanup upstream, within and downstream of the Site.
- Tailoring outreach and developing education programs for impacted and at-risk communities, like the education collaborative at Palos Verdes. This could include identifying and educating fisher communities about mechanisms to decrease impacts of fish consumption advisories on their livelihoods.
- Offering health screening where needed.
- Performing a study of the effectiveness of fish advisories in collaboration with the City of Portland.

Technical Advisor Comment

The community could ask EPA for an example of an Institutional Control Implementation and Assurance Plan and an opportunity to provide input into the Site's plan.

The ROD highlighted uncertainties in the human health risk assessment. EPA did not have access to site-specific fish consumption data. EPA also used small mouth bass fillets as a surrogate for all resident fish species. EPA noted that carp and brown bulkheads have higher PCBs in their bodies than smallmouth bass. Lastly, while EPA noted catfish is a common component of diets, it was not included in the risk assessment. Catfish are bottom feeders and tend to disturb river sediment. These three factors could underestimate risk from fish consumption. The community could ask EPA for a review of the potential impacts to health based on these assumptions and whether EPA plans to revise health risks as fish consumption and tissue data become available.

The ROD and Human Health Risk Assessment identified subsistence fishers and breastfeeding mothers as those at highest risk from the health impacts of fish consumption. Given this information, EPA could prioritize these two groups in its outreach programs and surveys. This could include working with houseless agencies and non-profits and prenatal medical health providers (including doctors, nurses, midwives and doulas) by providing direct training to staff and patients and placing informational flyers and advisories in offices. Additionally, EPA could consider implementing approaches from the examples below and evaluating lessons learned from these and other fish consumption advisory efforts.

³⁸ ROD Sec 14.

Technical Advisor Comment, continued

The ROD states that the education collaborative at Palos Verdes will be considered in developing outreach and education efforts to ensure that fish advisories for Portland Harbor are effective and appropriate. Since 2003, the Palos Verdes Fish Contamination Education Collaborative (FCEC) has provided education and outreach to the Palos Verdes community in Southern California about the dangers of consuming contaminated fish and ways to safely prepare fish. FCEC is a partnership of over 40 federal, state and local government agencies, local community-based organizations, and local fishers and anglers. FCEC shares information about safe fish consumption at schools, English as a Second Language classes and health fairs and also provides online and printed resources. The community could become familiar with the outreach and educational materials from FCEC and other similar programs to identify specific approaches that would be most appropriate and effective for the Portland Harbor community. The community could ask EPA to consider these approaches. Information about the Palos Verdes FCEC is available at <http://pvsfish.org>.

EPA and the Centers for Disease Control and Prevention (CDC) recently developed a clearinghouse website on fish advisories and fish contamination studies. The website provides federal guidance on fish consumption advisories and sample community surveys for understanding consumption and risk: <https://www.epa.gov/choose-fish-and-shellfish-wisely>.

The University of Illinois at Chicago provides examples of outreach materials used in Asian communities that include an image of the fish when caught and when prepared and also alternate common names for the fish:
https://www.niehs.nih.gov/research/supported/translational/peph/webinars/fish_consumption/promoting_healthy_seafood_choices_in_asian_communities_508.pdf.

In the Great Lakes, the Medical College of Wisconsin developed outreach materials for tribal communities using representations of fish species based on tribal artwork:
https://www.niehs.nih.gov/research/supported/translational/peph/webinars/fish_consumption/risk_communication_with_tribal_communities_508.pdf.

The Chicago and Great Lakes studies both relied on smart phone apps, with the Great Lakes study using a mobile app to allow people to calculate how many fish meals they should consume based on the fish species and the person's weight, age and gender.

Community Concern 3.4: How will public access to the river be provided?

The ROD notes that EPA does not have authority to require private property owners to allow access to the water. However, the ROD also states that there will be an opportunity to engage in discussions with EPA and the PRPs after the cleanup about the potential reuse of the Site. Thus, the most likely opportunity to consider public access would occur through reuse planning. According to the ROD, EPA can also ensure that the remedy design meets criteria for anticipated future uses. EPA's Superfund Redevelopment Initiative is a helpful resource for future use

considerations – it provides reuse-focused resources and materials for Superfund sites nationwide.

Technical Advisor Comment

The community could ask EPA to consider conducting a reuse assessment at the Site. These assessments identify key considerations and potential opportunities for future use at a site based on key site and cleanup considerations, community feedback, and input from property owners. EPA’s Superfund Redevelopment Initiative provides examples of reuse projects and plans: <https://www.epa.gov/superfund-redevelopment-initiative>.

Community Concern 3.5: How will the remedy support local jobs and hiring practices?

The ROD states that EPA will “encourage companies performing the cleanup to keep cleanup jobs with locally trained workers as much as possible and will offer resources where possible to teach special hazardous materials skills necessary to perform the cleanup.” EPA plans to work with local businesses to minimize any impacts of cleanup and construction on them.³⁹

EPA will encourage local hiring but cannot require it. All EPA cleanup contractors must meet requirements for using small business and minority/woman/veteran-owned business subcontractors.⁴⁰

Technical Advisor Comment

EPA and the community could consider EPA’s Superfund Job Training Initiative (SuperJTI) program as a resource to train local residents in skills needed to support the cleanup. The community can request SuperJTI services by contacting the EPA Community Involvement Coordinator Laura Knudsen at 206-553-1838 or knudsen.laura@epa.gov.

For more information about SuperJTI, visit: <https://www.epa.gov/superfund/learn-about-superfund-job-training-initiative>.

Community Concern 3.6: How were source control concerns and cumulative risks addressed?

Source control: The ROD states that “source control is critical in achieving RAOs for Portland Harbor.”⁴¹ EPA agreements with DEQ ensure that upland sources of contamination are addressed. A 2001 Memorandum of Understanding (MOU) states that DEQ is responsible for addressing upland and upriver contamination. A 2005 Joint Source Control Strategy also requires that DEQ prepare milestone reports.⁴² DEQ’s goal is to control all upland sources before in-river cleanup starts. According to the 2016 milestone report, DEQ had screened 171 sources as of March 2016.

³⁹ Responsiveness Summary 2-7.

⁴⁰ Responsiveness Summary 2-8.

⁴¹ Responsiveness Summary 2-187.

⁴² Responsiveness Summary 2-187.

EPA will also continue to have a role in upland source control, depending on the success of DEQ's efforts. EPA's policy is to not clean up COCs below natural and human-caused background levels, which will likely be affected by upland sources. The ROD notes that these background levels have not yet been established.⁴³ EPA also requires recontamination assessments as part of the pre-design or remedial design, including evaluation of upland, riverbank and in-river sources.⁴⁴ Monitoring programs will detect any recontamination. If upland source control is not progressing as planned, EPA retains discretion to use federal authorities to complete the cleanup actions.⁴⁵ Additionally, any existing or new discharges into the river will be accounted for in National Pollutant Discharge Elimination System (NPDES) permits, which are publicly available.

Cumulative risks: The ROD states that cumulative risk is defined as the residual risk left at the Site after the preliminary remediation goals (PRGs) are achieved. Residual risk also includes background levels according to the ROD. Additional information on how residual risk was calculated are in Appendix J of the FS. EPA selected PRGs based on a 1 in 1 million risk level for cancer and a hazard index of 1 for non-cancer health effects. In addition to the selected remedy, the most effective approach to reducing cumulative risk is to reduce upland sources of contamination. Additional information on residual risk is provided under the Primary Concern 6 section of this document.

Technical Advisor Comment

The community could ask EPA for a timeline and overview of the strategy to clean up upland sources of pollution as well as more information about how/when EPA would take over the upland source cleanup process if it is not progressing in a timely manner. Community members could also benefit from learning more about the approach EPA will use to determine background levels.

For additional resources, the community could review EPA's Port Primer (<http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100P1UQ.pdf>) and EPA's Ports Initiative web page (<https://www.epa.gov/ports-initiative>) for holistic approaches to addressing environmental justice and cumulative impacts at and near ports. EPA is currently piloting the Port Primer in three communities – Savannah, Georgia; New Orleans, Louisiana; and Seattle, Washington.

Primary Concern 4. The extent of monitoring and investigations

Community Concern 4.1: How will monitoring be standardized before, during and after cleanup?

Baseline sampling of sediment, surface and pore water, biota, fish tissue and river banks will take place before construction begins. Monitoring will continue during and after construction of

⁴³ Responsiveness Summary 2-25.

⁴⁴ Responsiveness Summary 2-189.

⁴⁵ Responsiveness Summary 2-25.

the remedy. In the river, monitoring will include five years of baseline data up and downstream of the Site. All monitoring will be designed to determine compliance with water quality standards.⁴⁶ Sampling locations and frequencies will be determined during the development of the Site's sampling analysis plans.⁴⁷ Post-construction monitoring will occur until cleanup levels are met. EPA or its contractors will inspect the remedy for potential issues after natural hazard events or boat incidents/impacts.⁴⁸

Community members were concerned about the potential downstream movement of contaminants during or after remedy construction. According to the ROD, downstream monitoring will be part of the work EPA will do to understand whether the cleanup is working. The monitoring plan will be designed to reduce the amount of contamination being sent downstream to the Columbia River and Multnomah Channel. The monitoring plan, currently being developed by EPA, will outline how far downstream monitoring will occur and the factors being monitored. EPA will sample downstream of the Site before any construction/cleanup begins so they will have a baseline of contamination upstream, at the Site and downstream. EPA plans to use Best Management Practices (BMPs) to prevent contaminants from moving downstream during the construction, though the ROD states that temporary increases in contamination levels in river water may be possible.

Technical Advisor Comment

The community will have an opportunity to review the sampling and monitoring plans. EPA is required to develop a Quality Assurance Project Plan (QAPP). The QAPP will outline the specific types of samples and how they will be collected and analyzed. EPA develops and updates QAPPs and Sampling and Analysis Plans for each component of the sampling/monitoring process. Several site QAPPs have been developed to better understand the concentration and location of site contaminants. The QAPPs are referenced in the 2016 RI Report. Since EPA plans to maintain a standardized sampling strategy to compare concentrations before, during and after remedy construction, the sampling and monitoring approach will likely not change significantly. If it does change significantly, before-and-after comparisons will be more difficult. The community could ask EPA about the anticipated timelines for developing QAPPs and Sampling and Analysis Plans and to what extent these plans are expected to change over time.

⁴⁶ Responsiveness Summary 2-107.

⁴⁷ Responsiveness Summary 2-104.

⁴⁸ Responsiveness Summary 2-107.

Technical Advisor Comment, continued

The EPA's monitoring approach uses a Before-After-Control-Impact (BACI) design, which is a statistically defensible approach used by a number of river ecologists. The community might want to ask EPA to describe the statistical analyses that will be used to determine whether the Site continues to be a source of contamination to downstream communities. Monitoring immediately downstream of the Site will be the best indicator of how well the cleanup process is progressing, though some sediment will move downstream during storms. The community may want to ask EPA to consider several components of the monitoring plan to ensure the monitoring data are representative of the future conditions in the river. The monitoring plan would benefit from requirements to include data from a range of hydrologic events, including droughts, average storms and large events. The community could also benefit from an understanding of how changes in land use or pollution inputs will affect the outcome of the monitoring work before, during and after cleanup.

MNR will be the component of the remedy requiring the most attention for long-term monitoring. The ROD states that there are 64 COCs at the Site, with most of the risks attributed to PCBs, PAHs, dioxins and furans, and pesticides such as DDT. These chemicals that contribute the most to risk do not readily degrade in the environment. Metals are also listed as site contaminants, and metals do not degrade. The community may want to review monitoring results after the remedy is in place to confirm that layers of cleaner sediment are covering and/or diluting contaminant concentrations in existing contaminated sediment over time.

For additional information on downstream contamination, the City of Portland and State of Oregon may have more information about what is being done to clean up any contamination that exists downstream of the Site. The City of Portland or the State of Oregon may also have information about other discharges coming into the river downstream of the Site. These additional discharge sources may elevate pollution in the river in addition to the contamination from the Superfund site.

Community Concern 4.2: Will monitoring data be available in a public database and as part of a data management plan?

The ROD did not address the availability of a public database for tracking monitoring data. However, Appendix A of the Remedial Investigation states that EPA maintains a Source and Site Characterization and Risk Assessment (SCRA) database. All sampling data through 2010 are maintained in the database.

Technical Advisor Comment

An example of a publicly available database is the Scribe database at the Lincoln Park Superfund site in Colorado. EPA relies on Scribe, an internal database, to manage data for many Superfund sites. EPA will be updating site data in Scribe quarterly. To learn more about Scribe, check out the Scribe Database Community User Guide, which TASC developed for CAG members at the Lincoln Park Superfund site: http://recycle4colorado.ipower.com/Cotter/2017/012717_TO18-R8-1.2-Lincoln-Park-CAG-SCRIBE-Guide.pdf. The community could ask if EPA plans to continue to update the SCRA database and if a similar approach to the Scribe database could be implemented at Portland Harbor.

Community Concern 4.3: How does the ROD address chemical air volatilization of PCBs and other COCs?

EPA received 41 comments expressing concern that the Agency has not evaluated human health risk from existing exposure to PCBs in air at the Site. Some comments indicated that people would like additional sediment to be dredged because of this perceived existing health risk and concern that remaining contamination will continue to expose people to unacceptably high levels of PCBs in the air. Commenters referred to recent literature, other Superfund sites and previous TAG technical advisor comments to support their concerns about possible volatilization of PCBs into air causing current and future health risks.

In its response, EPA explained that it followed its risk assessment guidance to determine that inhalation of contaminants released from sediment is not a complete exposure pathway because PCBs are not expected to volatilize significantly from sediment due to their low vapor pressure. EPA further pointed out that the highest surface concentrations at the Site are in the 1 to 35 parts per million range, most of which are to be removed by dredging or sequestered by capping, leaving no possibility of future long-term emissions to air. For comparison, PCB concentrations are much higher at the Hudson River Superfund site in New York, and the calculated cancer risk from inhalation of PCBs in air was insignificant there. Lower calculated risk is expected for the Portland Harbor site. EPA also stated that it will review any relevant new information regarding PCB volatilization that would cause the Agency to revisit the remediation footprint (the area targeted for cleanup).

Technical Advisor Comment

The amount of PCB volatilization at a Superfund site depends on a variety of conditions, including the nature and concentration of the PCBs, site conditions, the amount of exposure to air, temperature and wind velocity. It is reasonable for EPA to qualitatively conclude that volatilization of PCBs in the range of 1 to 35 parts per million in sediment will not contribute significantly to calculated risks. This does not mean that volatilization is not occurring; it means that people are more likely have significant risk from other exposure routes such as eating fish. TASC agrees with the ROD assessment that dredging or capping existing contaminated sediment will mitigate existing PCB volatilization from sediment.

Technical Advisor Comment, continued

PCB volatilization is likely to increase temporarily during remediation when sediment is disturbed and exposure to air increases. The community may want to ask EPA whether the remedial design will include air monitoring. There may be an opportunity to measure PCBs in air prior to, during and after remediation activities as part of the remedial action.

At some Superfund sites where volatilization is a concern, best management practices are used to mitigate transfer of PCBs from sediment into air during remediation activities. The New Bedford Harbor Superfund Site Draft Final Ambient Air Monitoring Plan for Remediation Activities discusses such best management practices, which include use of oil booms, keeping sediment wet and careful placement of removed sediment to reduce disturbance and suspension of contaminated materials. See <https://www.epa.gov/sites/production/files/2015-08/documents/577154.pdf>. The community may want to ask EPA if such practices will be employed at this site.

Community Concern 4.4: How will EPA monitor and mitigate remedy construction impacts on the community such as sound, light, diesel emissions and odors?

The ROD states that EPA will monitor any impacts of releases on communities, including air and water monitoring, use best management practices to avoid volatilization of chemicals, and encourage collaboration with academia and consultation with the community.

EPA will design the monitoring plan during the remedial design process with public input.⁴⁹ If health-based standards are exceeded, additional controls may be put in place. EPA will provide contact information so that the community can report complaints or concerns.⁵⁰ Sample monitoring plan components, as outlined in the ROD, include:

- Requiring closed buckets for dredging and sheet piles for nearshore work.
- Requiring site-specific plans for any issues, best management practices and protection of human health and the environment. Air quality, noise, odor, light and other community impacts will be taken into consideration. This includes developing plans for air and water monitoring during dredging, specifically air monitoring in the work area and at the perimeter of the Site or cleanup area.
- Development of health and safety plans.
- Development of contingency plans with corrective actions to address human-caused errors and natural hazards.

In addition to monitoring, EPA will reduce truck and rail traffic impacts by using barges to move sediment and will reduce volatile emissions and odors. Where trucks are used, EPA and contractors will use pollution control technologies, route trucks away from schools, and upgrade

⁴⁹ Responsiveness Summary 2-109.

⁵⁰ Responsiveness Summary 2-109.

roads to reduce community impacts and improve fuel efficiency.⁵¹ Sample best management practices include:

- Using reusable energy sources.
- Limiting idling.
- Transporting materials only after trucks are full to reduce traffic.
- Using on-site dust/noise control strategies.
- Requiring clean fuel and emissions control retrofit incentives in construction contracts.

Technical Advisor Comment

The ROD states that EPA will set up a system to identify and address community concerns. The community could review the Identifying Violations Affecting Neighborhoods (IVAN) tool (<https://ivanonline.org>) as a potential resource. IVAN was created by community-based organizations to bring federal, regional, state and local enforcement agencies together as part of monthly community forums to address site-related issues. IVAN coordinators collect community comments online and facilitate communication with agencies between monthly meetings.

Community Concern 4.5: How will progress toward remedy success be tracked, and what is the contingency plan if criteria are not met?

EPA will develop timelines and metrics for success during the remedial design phase.⁵² The ROD states that performance standards will be developed based on environmental media and scientific criteria and that the standards will be part of all remedial designs. Fish and shellfish tissue values will be used as a qualitative performance standard metric and to update CERCLA-related advisories. Contaminant loading to the Multnomah Channel and the Columbia River will be evaluated to ensure decreasing trends over time and that any elevated levels during construction are mitigated to the extent practicable. Compensatory mitigation projects will include performance standards such as native plant coverage, invasive species limits and the presence of target species.⁵³

Community members expressed concerns about the potential impacts of earthquakes on the capped contamination. The ROD states that EPA will design the caps (soil placed over contamination) to be protected from earthquakes and will monitor and inspect the caps after any earthquakes. Specifically, EPA will take the following actions to protect the caps from earthquakes:

- When slopes are greater than 15 percent but less than 30 percent, EPA will evaluate geotechnical information and site specific information to determine if the design should be modified. Areas with slopes greater than 30 percent are not eligible to be used as capped areas due to their risks.

⁵¹ Responsiveness Summary 2-140.

⁵² Responsiveness Summary 2-104.

⁵³ ROD Section 14.2.10.

- Planned capped areas will go through an analysis of proximity to faults, type of material used, slope and the strength and chance of an earthquake.
- EPA will develop contingency plans, part of the Institutional Control Implementation and Assurance Plan, with local cities and towns to develop actions if tank farms and other petroleum storage facilities leak during an earthquake and impact the Site.

Technical Advisor Comment

The community could ask EPA if it plans to conduct a liquefaction and slope stability analysis immediately upstream and within the Site. Landslides along the river could contribute sediment and additional contamination to the river.

Primary Concern 5. How does the ROD align with federal, state and local policies?

Superfund guidance (CERCLA Sec. 121(d)(1)/(2)) requires that any COCs left at a site must meet applicable or relevant and appropriate requirements (ARARs), including the federal Safe Drinking Water Act, Clean Water Act Sections 303 and 304, and any state standard, requirement, advisories, criteria or limitation that is more stringent than federal standards.⁵⁴ EPA can also use criteria and advisories that government agencies have not formally adopted, especially in cases where COCs interact with each other to affect toxicity levels to impact human health and the environment.

As new information and data are collected and additional ARARs are identified, they can be used to modify remediation goals. While EPA takes federal and state standards into account, the ROD states that EPA is not required to comply with City of Portland codes. The ROD does not accept the city codes as ARARs.⁵⁵

Community Concern 5.1: How does the ROD address federal Clean Water Act and Oregon Water Quality Standards?

The ROD states that many sources of contamination are impacting the river, including resuspension of contaminants from the river bed, runoff from riverbank erosion, groundwater input and stormwater runoff.⁵⁶ EPA expects cleanup and source control will decrease surface water contaminants to meet Oregon Water Quality Standards. However, more work will be needed at the watershed level. Monitoring will ensure compliance with water quality standards.⁵⁷

The ROD assumes that cleanup levels need to meet drinking water standards for surface water and groundwater. This assumption is consistent with state policy, which states that all groundwater in Oregon is considered designated for use as domestic water supplies. The ROD

⁵⁴ Responsiveness Summary 2-21.

⁵⁵ Responsiveness Summary 2-25.

⁵⁶ Responsiveness Summary 2-43.

⁵⁷ Responsiveness Summary 2-43.

accordingly assumes a continuous connection between surface water and groundwater and the same use for both sources.

The ROD relies on cleanup levels from the Safe Drinking Water Act and the Clean Water Act's National Water Quality Criteria, Section 304, which are similar to the State of Oregon's standards for surface and groundwater drinking water supplies. The ROD states that EPA will also ensure compliance with Section 401 of the Clean Water Act to reduce the input of new pollutants into the river. The ROD notes that short-term degradation of water quality may be acceptable in order to achieve long-term water quality goals. EPA and contractors will include best management practices such as dredging controls where needed to reduce transport of chemicals downstream during the cleanup process.⁵⁸

Community Concern 5.2: How does the ROD meet the requirements of the Oregon Health Authority's fish consumption standards?

The ROD relies on OHA guidelines for fish advisories and consumption to inform the number of fish meals that people could consume after cleanup for each of the alternatives (See Table 1).⁵⁹ Existing OHA fish consumption advisories apply to all resident fish at the Site, including carp, bass and catfish. The advisories state that none of the fish should be consumed by children under age six, women of childbearing age, or people with thyroid or immune system problems. Everyone else should eat no more than one fish meal per month. There is no advisory for consumption of migratory salmon because these fish do not reside at the Site long enough to bioaccumulate the contaminants in their tissue to levels of concern.

The ROD states that it would be beneficial for EPA to coordinate with OHA in the future.⁶⁰ EPA will maintain fish advisories at the Site until cleanup levels are achieved. OHA may need to keep fish advisories in place for the river due to additional upstream sources of contamination.⁶¹

Technical Advisor Comment

The community could ask EPA about a process for identifying and adopting new and/or revised ARARs as they become available. Typically, new ARARs are added during the five-year review process. However, the timing of this process may not always align well with the cleanup process and it might be beneficial to embed relevant ARARs into the cleanup process sooner.

The ROD mentions using non-promulgated guidance where chemicals have an additive effect. The community could ask EPA to clarify which COCs have an additive effect.

⁵⁸ Responsiveness Summary 2-43.

⁵⁹ ROD Table 22.

⁶⁰ Responsiveness Summary 2-119.

⁶¹ Responsiveness Summary 2-28.

Primary Concern 6. What are the potential human health effects before and after the cleanup?

The ROD summarizes the potential existing and future health effects from the Human Health Risk Assessment in Section 8.1. The ROD includes risks from exposure to sediment along the banks, in the river and on beaches used by people, from surface and groundwater contact and consumption of fish and shellfish. The risks were then evaluated based on how often people that live, work and play on the river would come in contact with water or sediment or would consume fish.

Existing risks at the Site were evaluated and then compared to the human health risks for each alternative. Existing risks were highest for exposure to PCBs and dioxins. Risks were highest for people consuming fish versus those coming in contact with water or sediment. Of the types of people consuming fish, those who depended on fish for subsistence or were breast feeding children were most at risk. At the site level, using reasonable maximum exposures (RME) to fish, subsistence fishers have a 1 in 100 chance of having cancer from consuming resident fish in the river. Similarly, tribal fishers have a 1 in 100 chance of having cancer from consuming fish fillets and 2 in 100 from consuming the entire fish.

The human health risks associated with each alternative are summarized below. The risk to human health and the environment remaining after cleanup is called "residual risk". The ROD included cancer and non-conventional health risks. For cancer risk, EPA's goal is 1 in 1 million people at risk from site contamination. EPA will typically require cleanup actions when more than one in 10,000 people are at risk of getting cancer from site contaminants. For non-conventional risk, a hazard index (HI) greater than "1" suggests a potential risk of health effects on people.

RAO 1 is the risk to human health from direct contact with sediment on beaches or in the river. The risk for cancer from contaminants was determined to be 1.8 in 100,000 (Alternative I), 1 in 100,000 (Alternative F Mod) or 7.2 in 1 million (Alternative G). RAO 2 is the risk to human health from fish consumption. The risk for cancer from contaminants was determined to be 1.7 in 10,000 (Alternative I), 1.5 in 10,000 (Alternative F Mod) or 8.9 in 100,000 (Alternative G). For non-cancer risks for children, the HI was 18 (Alternative I), 15 (Alternative F Mod) or 9 (Alternative G). Only Alternative G meets EPA's target of 10. For non-cancer risks for infants, the HI was 307 (Alternative I), 259 (Alternative F Mod) or 157 (Alternative G). All of these alternatives met EPA's target of 1,320.

Technical Advisor Comment

The community could ask EPA about the hazard index target for non-cancer risks to children for RAO 2. The non-cancer risks exceed the general EPA target of 1 and the site-specific target of 10 for Alternative F Mod. The community could ask about the types of non-cancer health effects that are possible with fish consumption at the Site.

List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
BA	Biological Assessment
BACI	Before-After-Control-Impact
BMP	Best Management Practice
CAG	Community Advisory Group
CDC	Centers for Disease Control and Prevention
CDF	Confined Disposal Facility
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CIP	Community Involvement Plan
COC	Contaminant of Concern
DDT	Dichlorodiphenyltrichloroethane
DEQ	Oregon Department of Environmental Quality
ENR	Enhanced Natural Recovery
EPA	U.S. Environmental Protection Agency
FCEC	Palos Verdes Fish Contamination Education Collaborative
FEMA	Federal Emergency Management Administration
FS	Feasibility Study
HI	Hazard Index
IVAN	Identifying Violations Affecting Neighborhoods
LWG	Lower Willamette Group
MNR	Monitored Natural Recovery
MOU	Memorandum of Understanding
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
OHA	Oregon Health Authority
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PRG	Preliminary Remediation Goal
PRP	Potentially Responsible Party
PTW	Principal Threat Waste
QAPP	Quality Assurance Project Plans
RAO	Remedial Action Objective
RI	Remedial Investigation
RME	Reasonable Maximum Exposures
ROD	Record of Decision
SCRA	Site Characterization and Risk Assessment
SuperJTI	Superfund Job Training Initiative
TAG	Technical Assistance Grant
TASC	Technical Assistance Services for Communities
USFWS	U.S. Fish and Wildlife Service

Technical Assistance Services for Communities Contact Information

Lead Technical Advisor
Marcus Griswold, Ph.D.
415-814-0393 ext. 299
mgriswold@skeo.com

Task Order Manager
Emily Chi
434-975-6700 ext. 238
echi@skeo.com

Senior Program Manager
Krissy Russell-Hedstrom
(434) 975-6700 ext. 279
krissy@skeo.com

Director of Finance and Human Resources
Briana Branham
434-975-6700 ext. 232
bbranham@skeo.com

TASC Quality Control Monitor
Eric Marsh
434-975-6700 ext. 276
emarsh@skeo.com