

90% Remedial Design Basis of Design Report

Appendix C

Clean Water Act Sections 401/404 and

Rivers and Harbors Act Section 10

Substantive Compliance Report

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## ABBREVIATIONS

ARAR	Applicable and Relevant or Appropriate Requirement
BA	<i>Biological Assessment</i>
BMP	best management practice
BODR	<i>Basis of Design Report</i>
CFR	Code of Federal Regulations
COC	contaminant of concern
CQAP	<i>Construction Quality Assurance Plan</i>
CWA	Clean Water Act
ENR	enhanced natural recovery
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESD	<i>Explanation of Significant Differences</i>
FNC	federal navigation channel
LDW	Lower Duwamish Waterway
MNR	monitored natural recovery
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
RAA	remedial action area
RAL	remedial action level
RD	remedial design
RHA	Rivers and Harbors Act
RM	river mile
RMC	residuals management cover
ROD	<i>Record of Decision</i>
WQMP	<i>Water Quality Monitoring Plan</i>

# 1 Introduction

This document presents a Clean Water Act (CWA) Sections 401/404 and Rivers and Harbors Act (RHA) Section 10 substantive compliance analysis for the proposed cleanup remedy for the upper reach of the Lower Duwamish Waterway (LDW) Superfund Site in King County, Washington. The LDW Superfund Site has been divided into three reaches (lower, middle, and upper) that are each undergoing remedial design (RD) on different timelines, with the upper reach being the first reach for which RD is being performed. The upper reach encompasses river miles (RMs) 3.0 to 5.0 of the LDW (Figures C1-1 and C1-2). The project is proposed to clean up sediment contamination resulting from more than a century of urbanization and industrial activity on the LDW.

The proposed cleanup remedy has been designed consistent with the U.S. Environmental Protection Agency (EPA)-approved *Remedial Design Work Plan for the Lower Duwamish Waterway Upper Reach* (Anchor QEA and Windward 2019) and the EPA's November 2014 *Record of Decision* (ROD; EPA 2014) as modified by an *Explanation of Significant Differences* (ESD; EPA 2021). The selected remedy for cleanup of the LDW is described in Section 13 of the ROD and as modified in the ESD. The selected cleanup remedy addresses unacceptable human health risks associated with consumption of resident fish and shellfish and with direct contact (skin contact and incidental ingestion of sediment) from net fishing, clamming, and beach play. It also addresses ecological risks to bottom-dwelling organisms (benthic invertebrates), fish, and wildlife.

The Preliminary (30%) RD for the upper reach identified areas of sediment that exceeded ROD-defined remedial action levels (RALs). The RAL exceedance areas were further refined and developed during subsequent design stages into remedial action areas (RAAs). The RAAs have a larger footprint and encompass the RAL exceedance areas to account for engineering and constructability considerations, providing a greater degree of confidence for removing sediment that exceeds the RALs. Figure C1-2 illustrates the RAA locations, based on the Pre-Final (90%) RD.

The technologies that will be used to remediate each RAA are based on ROD criteria. The remedial technologies selected for cleanup include a combination of dredging, enhanced natural recovery (ENR), engineered capping, and monitored natural recovery (MNR). In addition, a thin layer of clean residuals management cover (RMC) will be placed over all dredging areas and within an approximate 20- to 40-foot perimeter (or greater as approved by EPA) from the dredge footprint to leave the post-remedial action surfaces below applicable RALs.

This document represents an "equivalency analysis" that can be used by EPA to document its substantive compliance with the CWA Section 404 and RHA Section 10 Applicable and Relevant or Appropriate Requirements (ARARs). This document is prepared as a supplement to the Pre-Final (90%) RD *Basis of Design Report* (BODR) for the LDW upper reach, which includes a detailed description of the proposed cleanup remedy.

## 2 Clean Water Act Section 401/404 Compliance

CWA Section 404 regulates discharge of dredged material and placement of fill within waters of the United States or jurisdictional waters (40 Code of Federal Regulations [CFR] Parts 230 and 232). The LDW is a navigable waterbody and therefore a “water of the United States.” Section 404(b)(1) of the CWA requires that proposed actions be designed to avoid or minimize adverse impacts to aquatic resources and waters of the United States. Compliance with CWA Section 401 is demonstrated in the *Water Quality Monitoring Plan* (WQMP) prepared as Appendix A of the *Construction Quality Assurance Plan* (CQAP; 90% RD Volume II, Part I).

The EPA Region 10 Decision Framework for Determining Clean Water Act Section 404 Compliance at Superfund Sites (EPA 2000) requires that information be provided to address several findings. The findings and information related to them are presented in the following paragraphs and demonstrate compliance with the substantive provisions of Sections 401 and 404 of the Clean Water Act.

### **1. There are no other practicable alternatives that will result in less impact to the aquatic environment.**

The proposed cleanup remedy (i.e., the remedial action for upper reach) is needed to address contamination at the LDW Superfund Site consistent with the remedial action defined in the ROD (EPA 2014) and ESD (EPA 2021). The primary contaminants exceeding RALs in the upper reach are polychlorinated biphenyls (PCBs). Other contaminants that determine the RAL cleanup areas include metals, polycyclic aromatic hydrocarbons (PAHs), phthalates, other semivolatile organic compounds (e.g. benzoic acid and phenol), and dioxins/furans, depending on the area (Anchor QEA and Windward 2022; BODR Appendix A). The remedy will address unacceptable human health risks associated with consumption of resident fish and shellfish and with direct contact (skin contact and incidental ingestion) from net fishing, clamming, and recreational beach uses. The project also addresses ecological risks to bottom-dwelling organisms (benthic invertebrates), fish, and wildlife. The selected remedy includes active remediation and natural recovery to achieve remedial action objectives. There will be long-term monitoring to assess the success of the remedy in achieving cleanup levels.

The remedial technologies selected for cleanup include a combination of dredging, ENR, engineered capping, and MNR. The current design minimizes dredge and fill discharges to the extent possible while addressing contaminated sediments and restores existing habitat elevations to meet the intent of the ROD. The *Biological Assessment* (BA), prepared as BODR Appendix E, includes conservation measures and construction best management practices (BMPs) designed to avoid or minimize potential impacts to the environment. There are no other practicable alternatives that will result in less impact to the aquatic environment while meeting the intent of the ROD.

**2. The discharge will not cause or contribute to violations of water quality standards or toxic effluent standards, jeopardize an endangered or threatened species, destroy or adversely modify critical habitat, or impair a protected marine sanctuary.**

The proposed cleanup remedy is designed to minimize the potential for exceedances of ambient water quality to the extent practicable. This includes implementing water quality monitoring described in the WQMP (Appendix A of 90% RD Volume II, Part I) for compliance with Washington State water quality standards. The construction contractor will be required to employ BMPs to limit water quality impacts, as described in the specifications (90% RD Volume III). Should monitoring identify water quality exceedances, then the contractor will be required to modify operations to correct the exceedances.

The BA prepared as BODR Appendix E describes how the project will not jeopardize Endangered Species Act (ESA)-listed species or destroy or adversely modify critical habitat. The project will implement conservation measures and construction BMPs to avoid or minimize potential impacts to ESA-listed species or critical habitat as described in the BA. This includes working during the approved in-water work window for the LDW when ESA-listed species are least likely to be present.

Work will not occur within nor will it impair a protected marine sanctuary.

**3. The discharge will not result in significant degradation to waters of the United States.**

The proposed cleanup remedy is designed to minimize the potential for exceedances of ambient water quality to the extent practicable. Water quality monitoring will be conducted under an EPA-approved WQMP for compliance with Washington State water quality standards during construction. The construction contractor will be required to employ BMPs to limit water quality impacts, as described in the specifications. Should monitoring identify water quality exceedances, the contractor will be required to modify operations to correct the exceedances.

All dredge areas will also include either backfilling to grade, placement of an engineered cap, or placement of RMC within the dredge footprint such that the entire dredge prism will have a cover of clean material post-construction. In addition, RMC will be placed within an approximate 20- to 40-foot perimeter (or greater as approved by EPA) from the dredge footprint. The completed cleanup remedy will result in no significant degradation of waters of the United States.

**4. Potential adverse impacts to the aquatic ecosystem are minimized to the extent practicable and appropriate.**

The proposed cleanup remedy fully and most effectively meets the purpose and need of the project and balances dredging and alternate technologies to remediate the LDW upper reach portion of the site consistent with the ROD. Although there would be short-term impacts to the environment

during construction, it is expected that these impacts would be mitigated through avoidance and minimization measures and BMPs implemented during construction, as described in the Pre-Final (90%) RD BODR and the BA (BODR Appendix E). Over the long term, there would be a net improvement to the aquatic ecosystem from removal of and protection from contaminants. There will be long-term monitoring to assess the success of the remedy in achieving cleanup levels.

Mudflats are designated as a category of special aquatic sites per 40 CFR 230 Subpart E. Several intertidal mudflats are present in the LDW upper reach. Potential impacts to mudflats from discharge of dredge and fill materials include changes in water circulation patterns, which may permanently flood or dewater the mud flat or disrupt periodic inundation, resulting in an increase in the rate of erosion or accretion. Such changes can deplete or eliminate mud flat biota, foraging areas, and nursery areas.

The proposed cleanup remedy assigns remedial technologies to three RAAs that are located in or adjacent to mudflats at RAAs 27 (BODR Figure 6-2f), 30, and 31 (BODR Figure 6-2i).

The remedial technology assigned to RAA 27 is dredging and backfilling to original grade in the intertidal mudflat and removal and reconstruction of the upper intertidal riprap bank. Because backfilling with mud is not feasible, clean sand or a gravelly sand will be placed to restore the existing elevations in the intertidal mudflat area. Because the post-construction bathymetry remains the same, inundation and sedimentation patterns that created the mudflats are expected to restore the substrate to mud over time. The reconstructed upper intertidal riprap bank in RAA 27 will be designed to function as an engineered cap.

Dredging will occur in RAAs 30 and 31, which are located in an intertidal mudflat along the southern edge of the Turning Basin near RM 4.7. The assigned remedial technologies for these sites, per the RD, are dredging with backfill and the replacement of in-use timber piles as necessary. Because backfilling with mud is not feasible, clean sand or gravelly sand will be placed to restore the existing elevation. Because the post-construction bathymetry remains the same, inundation and sedimentation patterns that created the mudflats are expected to restore the substrate to mud over time.

There are no alternative sites available to perform these remedial actions while addressing the RAL exceedances within these three RAAs consistent with the ROD. As described previously, construction impacts from the proposed cleanup remedy in these areas will be short term, and it is expected that regular inundation and sedimentation are expected to restore the substrate to mud over time. Potential adverse impacts are minimized to the extent practicable and appropriate.

### 3 Rivers and Harbors Act Section 10 Compliance

Section 10 of the RHA prohibits the unauthorized obstruction or alteration of any navigable waters of the United States (33 United States Code Section 403). As described in the Pre-Final (90%) RD BODR, requirements for dredging, capping, ENR, and backfill elevations have been established in the ROD (EPA 2014) and were designed to accomplish the following: 1) preserve navigation and commerce by maintaining elevations below the authorized depth in the federal navigation channel (FNC); and 2) preserve habitat at elevations between -10 feet mean lower low water and mean higher high water (or within an elevation band defined by EPA). Preserving habitat areas is accomplished by complying with the ROD requirement to return dredged areas in these habitat areas to pre-construction elevations by backfilling the dredged areas with habitat suitable materials.

Any existing structures that are demolished or modified as part of the project will be either restored to provide the functional equivalent of existing conditions or permanently removed with consent of the owner (if privately owned). The *Section 408 Substantive Compliance Report* prepared as BODR Appendix D describes how the project will provide sufficient space within the FNC to allow commercial and recreational vessels to maneuver around vessels during construction and avoid or minimize potential impacts to navigable waters of the United States.



## 4 References

Anchor QEA and Windward (Anchor QEA and Windward Environmental), 2019. *Remedial Design Work Plan for the Lower Duwamish Waterway Upper Reach*. December 2019.

Anchor QEA and Windward, 2022. *Pre-Design Investigation Data Evaluation Report for the Lower Duwamish Waterway Upper Reach*. Prepared for EPA. July 15, 2022.

EPA (U.S. Environmental Protection Agency), 2000. Letter to: Office of Environmental Cleanup, Office of Ecosystems and Communities and Office of Regional Counsel Superfund Project Staff. Regarding: Region 10 Decision Framework for Determining Clean Water Act Section 404 Compliance at Superfund Sites. June 26, 2000.

EPA, 2014. *Record of Decision*. Lower Duwamish Waterway Superfund Site. November 2014.

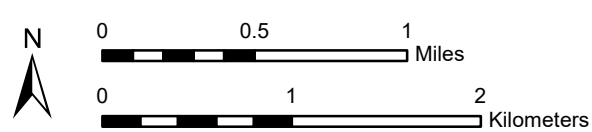
EPA, 2021. *Explanation of Significant Differences*. Lower Duwamish Waterway Superfund Site. September 2021.

## Figures

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Aerial photo: ESRI/DigitalGlobe, 0.5 m resolution, July 2017



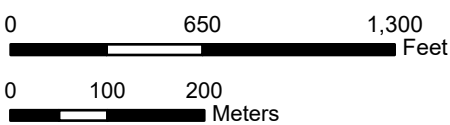
**Figure C1-1. LDW Superfund Site vicinity map and identification of upper reach**

90% REMEDIAL DESIGN BASIS of DESIGN  
 REPORT FOR THE LDW UPPER REACH  
 JULY 17, 2023

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- River mile
- - - Federal navigation channel
- ▭ Remedial Action Area (RAA)



**Figure C1-2. Remedial Action Areas within the Upper Reach**

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JULY 17, 2023

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