UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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SUPERFUND AND
EMERGENCY MANAGEMENT
DIVISION

Memorandum

CLEAN WATER ACT §404 ARAR MEMO: SUBSTANTIVE WATER QUALITY REQUIREMENTS FOR THE GASCO IN SITU STABILIZATION AND SOLIDIFICATION FIELD PILOT STUDY AT THE PORTLAND HARBOR SUPERFUND SITE

September 8, 2023

I. Introduction

This Clean Water Act §404 Applicable or Relevant and Appropriate Requirements Memorandum (CWA §404 ARAR Memo) documents the United States Environmental Protection Agency's (EPA's) determination that in-water activities associated with the Gasco Sediment Project Area In Situ Stabilization and Solidification (ISS) Field Pilot Study at the Portland Harbor Superfund Site meets the substantive requirements of The Clean Water Act §404 (CWA §404). This determination included coordination and review with EPA's Office of Water. A copy of this CWA §404 ARAR Memo and any future amendments will be placed in the Site File. In addition, copies of this original and any future amendments shall be kept on the job site and made readily available for reference by EPA, the contractor, and any other appropriate federal, tribal, state, and local inspectors.

NW Natural is currently performing the design activities specified in the Administrative Settlement Agreement and Order on Consent for Removal Action (ASAOC) at the Gasco Sediment Project Area within the boundaries of the Portland Harbor Superfund Site, CERCLA Docket No. 10-2009-00255, issued in September 2009. The Pilot Area is a subset of the Project Area. The Pilot consists of an in-water construction footprint of 1,750 square feet (0.04 acre), is located approximately at RM 6.4, and is representative of Project Area sediment conditions. The Pilot Area contains visual observations of principal threat waste (PTW) nonaqueous phase liquid (NAPL), elevated concentrations of contaminants of concern, and intervals of fine-grained sediment. The average daily production rate for over the 4-week Pilot Study is anticipated to be 60 to 100 cubic yards of ISS-treated sediment (e.g., approximately two ISS columns). The overall goal of this field pilot is to determine which means and methods optimize ISS implementation and performance in the field. Objectives include optimizing construction methods, post-ISS swell material management, and BMPs as well as verifying post-construction ISS characteristics, quantifying vibrations, and performing post-construction sampling. To minimize effects to juvenile salmonids, the Pilot Study will be completed during the in-water construction window and is currently expected to occur from September through October 2023. Pilot study mobilization, construction, and demobilization is expected to take 6 to 8 weeks. A detailed description of the Field Pilot background and design can be found in the In Situ Stabilization and Solidification Field Pilot Study Work Plan (ISS FPSWP) prepared by NW Natural's Design Team (Anchor QEA, Sevenson Environmental Services, and Hahn and Associates).

A copy of this CWA §404 ARAR Memo and any future amendments shall be included as an Attachment to the Water Quality Monitoring Plan. Copies of this original and any future amendments shall also be kept on the job site and made readily available for reference by the EPA, the contractor, and any other appropriate federal, tribal, state, and local inspectors.

The in-water activities covered in this evaluation of substantive compliance with CWA §404 ARAR Memo include: Sediment ISS Treatment, ISS Post-Treatment Swell Management, Timber Dolphin Removal, and Temporary Ramp and Pier Installation.

The EPA is responsible for review of this project to ensure compliance with the substantive requirements of the CWA §404 as outlined in the PHSS Record of Decision (EPA 2017). This Memo is intended to meet the substantive short-term requirements of CWA Sections 401, 402, 404, 301, 303, 304, 306, 307, 308, and Oregon's water quality law and regulations including ORS 468B .025 and .048 and OAR 340-41-0002 through 0059, 0340, and 0345, and OAR 340-048-0015.

This finding of substantive compliance with CWA §404 ARARs is based on our review of the following documents:

- August 2023, Gasco Sediments Revised In Situ Stabilization and Solidification Field Pilot Study Work Plan and associated appendices including:
    - Appendix C, Revised In Situ Stabilization and Solidification Field Pilot Study Water Quality Monitoring and Quality Assurance Plan
    - Appendix D, Spill Control Plan
    - Appendix E, Revised CWA Section 404(b)(1) Analysis

The Water Quality Monitoring Plan (WQMP) serves as the overall water quality monitoring plan for the project, though conditions of this CWA §404 ARAR Memo shall supersede the WQMP when specifications conflict among those documents. Should new or more specific information become available during implementation of the project, an amended CWA §404 ARAR Memo will be prepared by the EPA, if necessary.

II. Removal Action

Details of this pilot study are described in the Revised In Situ Stabilization and Solidification Field Pilot Study Work Plan. The following is a brief summary of the study's components that are relevant to water quality.

- Sediment ISS Treatment - The ISS is expected to be constructed using a hydraulic rotary drill rig equipped with an 8-foot auger on an appropriately sized barge platform. ISS grout injection and mixing occurs within columns. Columns are constructed by drilling into the sediment to create a series of overlapped columns. The required number of columns are advanced to depths below the sediment surface down to the depth of

contamination. Injection of the grout mixture within each column occurs by pumping the mixture through the hollow-stem auger during penetration and is simultaneously mixed with impacted sediment. Grout is injected throughout the entire column and is mixed at a constant rate typically over a single auger pass. When mixing is complete, the auger is extracted and moved to the next column location. No sediment is removed from the column during grout injection.

- ISS Post-Treatment Swell Management – Swell is the expansion of the grout material and sediment mixture that causes a mound to occur at the sediment surface. After the columns are injected over a certain area, the mounded swell materials will be removed as necessary to return the sediment bed to the approximate pre-construction elevations, while accounting for the uneven surface created by removal using a dredge bucket, equipment tolerances, and ensuring no net elevation increase across the field pilot study area. Swell material removal is anticipated to occur every day, or every other day.

  Swell material removal will occur inside a mobile moon pool curtain. The removal is expected to be performed using a long-reach excavator positioned that can reach the areas of column installation with a 2 cubic yard environmental swell removal bucket. The removed material will be placed in 450-ton watertight barges. When filled to capacity, the scow carrying swell material will be transported to a transloading facility for decanting of any overlying water to Baker tanks onshore.

- Transport and Disposal of ISS-Treated Swell Material – Transport of the removed swell material from the Pilot Area to the disposal site will be accomplished in three stages: in-water transportation to the transload facility via water-tight barge, transfer of sediment from the barge to either a truck or rail car at the identified transload facility, and upland transportation to the disposal site.

  No dewatering fluids collected during swell removal will be returned to either the Willamette or Columbia rivers. Swell material and removed dewatering fluids will be stored and transported to the transloading facility on water-tight dredge material barges. All free water generated during the transport of swell material to the transloading facility will either be absorbed with a drying amendment or will be pumped from the water-tight material barge to an onshore tank at the transloading facility.

- Timber Dolphin Removal - A dilapidated timber dolphin adjacent to the northwest corner of the Pilot Area will be removed to facilitate access to the Pilot Area. The dolphin is located in a shallow water area approximately 8 feet below OLW (Figure 2). No as-built drawings are available for this dolphin, so the exact dimensions of the individual pilings cannot be determined. It is uncertain if the piles are creosote-treated, and this will be confirmed after removal to determine the appropriate disposal location. Based on visual observations of the dolphin, the dolphin consists of 4 timber piles that are estimated to be 12 inches in diameter and approximately 50 feet long and 8 to 12 timber piles that are broken some distance above the mudline that are estimated to be 12 inches in diameter and approximately 30 feet long.

- Temporary Ramp and Pier Installation – A 450 square foot aluminum or wood ramp will be installed from the top of the riverbank where the grout plant will be located to below OHW where an 800 square foot pier structure will be placed extending waterward for access to facilitate movement of field personnel and samples from the uplands to the in-water field pilot vessels. Minimal grading (in the dry) will be necessary prior to placement, but there will not be any fill or removal associated with placing the ramp. The ramp and pier structures will both be removed after the Pilot Study is completed.

III. Conditions of Substantive Compliance

As documented in this 404 ARAR Memo, EPA finds that it has reasonable assurance that the discharges associated with the Gasco Sediment Project Area ISS Field Pilot Study as proposed and conditioned will be in substantive compliance with CWA Sections 401, 402, 404, 301, 303, 304, 306, 307, 308, and Oregon's water quality law and regulations including ORS 468B .025 and .048 and OAR 340-41-0002 through 0059, 0340, and 0345, and OAR 340-048-0015. This finding of compliance with the substantive requirements of the CWA §404 ARARs is subject to the following terms and conditions:

A. General Conditions

1. Expiration and Amendment

a. This CWA §404 ARAR Memo shall become effective on the date it is signed and shall remain valid for one construction season, expiring October 31, 2023 unless specifically extended by EPA through amendment. All in-water construction activities related to this field pilot will be prohibited after October 31, 2023, unless timing extensions are specifically coordinated and approved by the appropriate resource agencies.

b. Prior to expiration, this CWA §404 ARAR Memo may be amended if there are significant additions, changes, modifications, and revisions to the Work Plan, the WQMP or other EPA-approved performing party submittals.

c. The EPA contact person for amendments, modifications, approvals, or any other changes to this CWA §404 ARAR Memo is Hunter Young (young.hunter@epa.gov), Superfund and Emergency Management Division (503) 326-5020.

2. Reporting

a. The EPA must be notified as soon as possible and within 2 hours of any confirmed water quality criteria exceedance or failure to comply with conditions of this CWA §404 ARAR Memo. Typically, the EPA Project Manager (PM) will be notified first and they will then immediately notify the EPA Water Quality Specialist (WQS); however, the reverse may occur.

EPA Project Manager: Hunter Young (503) 326-5020; young.hunter@epa.gov

EPA Water Quality Specialist (WQS): Erika Hoffman, (360) 753-9540; hoffman.erika@epa.gov

b. Pre-project: The EPA's project manager shall be notified at least 2 weeks prior to the commencement of placement activities.

c. Daily reporting: Data will be collected and recorded in the field on the Water Quality Monitoring Form and the Water Quality Sampling Form, or equivalent. At the end of each field day, the field forms will be scanned and emailed to the Construction Quality Assurance Officer (CQAO) and EPA. EPA will be notified of an exceedance of a water quality parameter immediately after an exceedance is confirmed, as described in the contingency response actions in Section 3.6, and if further analysis indicates that the exceedance was caused by Pilot Study construction activities. The chemical monitoring results will be reported to EPA as they are received from the laboratory.

d. Final project report: After all construction has been completed, the water quality monitoring data for the entire construction project will be provided to the EPA in a Water Quality Monitoring Report (WQMR) as an appendix to either the Preliminary Design Report or Interim Design Report, depending on the project schedule. The WQMR will, at a minimum, include the following information:

- A description of field sampling activities and a plan view of monitoring locations relative to the location pilot project activities;
- A summary of field observations, including sampling times, weather conditions, water conditions, silt plumes, distressed/dying fish, and any relevant anecdotal or unusual observations;
- Any deviations from the specifications of this WQMQAP and reasons for the deviations
- Tabular summaries of all water quality monitoring data with comparisons to water quality compliance criteria
- Time-series plots depicting field and chemical parameters on the Y axis with time on the X axis and callouts for any BMP or work area/work type changes such that observed correlations and trends can be applied to future remedial action work.
- Narrative text describing the results of water quality monitoring related to each ISS construction operation (e.g., debris removal, timber dolphin removal, ISS treatment, and ISS post-treatment swell management dredging)
- Narrative discussion of any water quality exceedances, probable cause of the exceedance(s), results of follow-up measurements, agency communications and decisions, and actions taken to mitigate the exceedance(s), including implementation of additional or enhanced BMPs
- Lessons learned regarding BMP implementability and effectiveness
- An appendix containing all completed Water Quality Monitoring Forms
- Documentation of instrument calibration will be provided on request

3. Incorporation of Other Documents by Reference:

The Revised ISS FPSWP (September, 2023) includes project details and identifies BMPs to be applied to the site. The WQMP is an appendix to this report. The final versions of these documents are incorporated by reference here.

Additions, changes, modifications, and revisions to the Revised ISS FPSWP, WQMP, or any other deliverables by NW Natural, shall require prior notification to and approval by the EPA. If significant, the change will be documented and if necessary, an amended 404 ARAR Memo will be prepared by the EPA Water Quality Specialist.

4. Fish Timing Window

Salmonids listed under the Endangered Species Act utilize the Lower Willamette River for migration and feeding. In order to minimize potential impacts from actions associated with this project, in-water construction activities will occur between July 1 and October 31 which is within the in-water work window established for this area by U.S. Fish and Wildlife Services and the National Oceanic and Atmospheric Administration. In the event additional time is needed to complete construction, EPA will coordinate with the U.S. Fish and Wildlife Services and the National Oceanic and Atmospheric Administration to see if work can be completed without impacts to salmonids or other threatened or endangered species or their designated critical habitat.

B. Water Quality and Water Quality Monitoring

1. Applicable Activities

Water quality monitoring will be conducted for the in-water construction phases of this project. Chemical monitoring of indicator COCs in the water column will also be performed. Visual monitoring of construction and background locations will be performed at the transload facility, with confirmation turbidity monitoring if a plume is visually observed. In-water activities requiring water quality monitoring are:

- Debris removal (if needed to prepare the areas for stabilization)
- Timber dolphin removal
- ISS sediment treatment (grout injection and mixing)
- ISS post-treatment swell material removal

2. Compliance Standards

The action will meet the substantive requirements of the applicable provisions of CWA §401, 402, 404, 301, 303, 304, 306, 307, 308, and Oregon's water quality law and regulations as related to minimizing short-term impacts on aquatic resources from the discharge of dredged or fill material.

3. Points of Compliance

This CWA §404 ARAR Memo establishes the Points of Compliance for this project in Table 1.

During normal river flow and ebb tide conditions, measurements of field parameters will be collected at the following stations:

- Compliance Stations: Two compliance stations 150 feet downcurrent from the existing reconfigured oil containment and absorbent booms (CS-1N and CS-2N)
- Early Warning Station: One early warning station 100 feet downcurrent from the existing reconfigured oil containment and absorbent booms (EW-1N). The objective of the early warning station is to become more quickly aware of potential field parameter water quality impacts at the construction area, and to be able to adjust ISS operations or BMPs before a field parameter exceedance occurs at a compliance station.
- Background Station: One background station will be established at least 300 feet upcurrent from the Site (BG-1S) and beyond the influence of Pilot Study construction activities. The background station will be sited in a comparable water depth as the Pilot Study work area.

During flood tides, these stations will be reversed, as will the "N" and "S" codes on the station names, which represent general north and south compass directions (i.e., N = downstream, S = upstream). Flood tide stations will include BG-1N, EW-1S, CS-1S, and CS-2S. The phase of the tide will be determined by National Oceanic and Atmospheric Association tidal predictions and direct field observations during monitoring.

Table 1: Summary of Monitoring Stations and Locations for the Pilot Study Area by Tidal Stage

Tidal Stage	Station	Station ID	Location
Ebb	Background	BG-1S	300 feet upcurrent of the Site
	Early Warning	EW-1N	100 feet downcurrent of the existing reconfigured oil containment and absorbent booms
	Compliance	CS-1N CS-2N	150 feet downcurrent of the existing reconfigured oil containment and absorbent booms
Flood	Background	BG-1N	300 feet upcurrent of the Site
	Early Warning	EW-1S	100 feet downcurrent of the existing reconfigured oil containment and absorbent booms
	Compliance	CS-1S CS-2S	150 feet downcurrent of the existing reconfigured oil containment and absorbent booms

At each monitoring station, measurements of field parameters will be collected at the following three depths:

1. Within 1 foot of the river surface
2. At the midpoint of the water column
3. Within 3 feet of the riverbed

Target monitoring depths will be established based on measurements of the water depth at the specific monitoring station at the time of monitoring.

4. Applicable Water Quality Criteria

i. Turbidity

Consistent with Oregon state water quality standards (OAR 340-041-036), the following turbidity criteria will apply at the compliance boundary:

- Turbidity should not exceed 5 NTU above background if background is less than 50 NTU.
- Turbidity should not exceed 10 percent above background if background is greater than 50 NTU.

Background turbidity will be established using contemporaneous measurements at upcurrent background locations. Turbidity exceedances at the compliance boundary will trigger potential contingency response actions outlined in the WQMP.

ii. Temperature

The lower mainstem Willamette River has been designated as a salmon and steelhead migration corridor according to OAR 340-041-0340. At the point of compliance, the 7-day average temperature shall not exceed 20.0°C (OAR-340-041-0028). When ambient conditions exceed 20.0°C, no temperature increases will be allowed, which will raise the receiving water temperature greater than 0.3°C. The ISS process includes an exothermic reaction (i.e., heat of hydration), and potential temperature impacts will be monitored accordingly.

iii. pH

Consistent with Oregon state water quality standards (OAR 340-041-0021), pH levels at the point of compliance may not fall outside of 6.5 to 8.5 standard units.

iv. Dissolved Oxygen

Consistent with Oregon state water quality standards (OAR 340-041-0016), for waterbodies identified as providing cold-water aquatic life, the DO may not be less than 6.5 as a 7-day minimum and may not be less than 6.0 mg/L as an absolute minimum.

v. Indicator COCs

Consistent with Oregon state water quality standards (OAR 340-041-0033), toxic substances may not be introduced above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife, or other designated beneficial uses. Acute and chronic criteria for the ISS Field Pilot Study indicator COCs, benzo(a)anthracene and benzo(a)pyrene, are

summarized in Table 2. Acute criteria will be the compliance criteria for water quality monitoring during all Pilot Study activities because such activities are intermittent and ephemeral in nature. Chronic criteria will be used to evaluate the effectiveness of construction BMPs, and the potential need for additional or enhanced BMPs, but will not be used for compliance purposes.

Table 2: Acute and Chronic Chemical Water Quality Criteria

Analyte	Units	Chronic Criteria[1]	Acute Criteria	Reference
Benzo(a)anthracene	µg/L	2.2	9.2	[1]
Benzo(a)pyrene	µg/L	0.96	4.0	[1]

Notes:
1. Chronic criteria will be used to evaluate the effectiveness of construction BMPs and the potential need for additional or enhanced BMPs, but will not be used for compliance purposes.
References:
[1] Acute and chronic PAH criteria are from Procedures for Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures (EPA 2003).

5. Water Quality Monitoring

EPA has approved the Revised ISS FPSWP and associated appendices including the WQMP and the Quality Assurance Project Plan and these documents are incorporated by reference as a condition of this CWA §404 ARAR Memo. Any additions, changes, modifications, and revisions to the ISS Field Pilot Study shall require prior notification to and approval by EPA.

i. Visual Monitoring

Visual monitoring will take place continuously whenever construction is actively underway, including at the transload facility, and in tandem with field parameter collection. Construction is anticipated to occur only during daylight hours.

ii. Conventional Field Parameter Monitoring

Water quality monitoring for conventional field parameters (turbidity, temperature, pH, and DO) will be conducted every 2 hours each day during all sediment-disturbing construction activities:

- Debris removal
- Timber dolphin removal
- ISS sediment treatment
- ISS post-treatment swell removal

Implementation of the ISS Field Pilot Study is anticipated to occur only during daylight hours. No monitoring will be initiated within 2 hours before dark and during dark hours. Water quality parameter triggers and the associated work restrictions and contingency response actions are summarized in Table 3.

Table 3: Water Quality Field Parameter Triggers

Parameter	Unit	Location	Trigger[1,2]	Work Restrictions	Action Triggered
Turbidity	NTU	150 feet downcurrent of the existing reconfigured oil containment and absorbent booms at compliance boundary	0–5 NTU above BG (where background <50 NTU) >10% over background (where background >50 NTU)	No work restrictions	None
			>5 NTU over background (where background <50 NTU) >10% over background (where background >50 NTU)	Implement additional BMPs	Inspect construction and select additional BMPs that focus on the cause of the exceedance. If exceedance continues after new BMPs are implemented, cease all in-water activities, and notify EPA.
			>50 NTU above background	Stop work	Operations cease until turbidity is <5 NTU above background and additional BMPs are implemented, or approval has been given by EPA.
Temperature		150 feet downcurrent of the existing reconfigured oil containment and absorbent booms at compliance boundary	>20.0°C (where background is >20.0°C, temperature increase greater than 0.3°C)	Stop work	Operations cease until temperature levels have returned to compliant levels and approval has been given by EPA.
pH	SU	150 feet downcurrent of existing reconfigured oil containment and absorbent booms at compliance boundary	pH <6.5 or pH >8.5	Implement additional BMPs	Inspect construction and add/modify BMPs that focus on the cause of the exceedance. If exceedance continues after new BMPs are implemented, cease all in-water activities, and notify EPA.
Dissolved Oxygen	mg/L	150 feet downcurrent of existing reconfigured oil containment and absorbent booms at compliance boundary	DO >6.5 mg/L	No work restrictions	None
			DO <6.5 mg/L	Implement additional BMPs	Inspect construction and select additional BMPs that focus on the cause of the exceedance. If exceedance continues after new BMPs are implemented, cease all in-water activities, and notify EPA.
			DO <6.0 mg/L	Stop work	Operations cease until DO is >6.0 mg/L and additional BMPs are implemented, or approval has been given by EPA.

Table 3 (continued): Water Quality Field Parameter Triggers

Parameter	Unit	Location	Trigger[1,2]	Work Restrictions	Action Triggered
Turbidity	Visual Observation	150 feet downcurrent of existing reconfigured oil containment and absorbent booms at compliance boundary	Turbidity plume extending beyond the compliance boundary for more than 1 hour	No work restrictions	Conduct turbidity monitoring
Oil/Sheen	Visual Observation	150 feet downcurrent of existing reconfigured oil containment and absorbent booms at compliance boundary	Minor project-related sheen	No work restrictions	Inspect construction and add/modify BMPs.
			Substantial project-related sheen	Stop work	Inspect construction and add/modify BMPs, and notify EPA, National Response Center, and Oregon Emergency Response System.
			Oily project-related plume (heavy, contiguous, and persistent oily release)	Stop work	Notify EPA and deploy spill response team.
Distressed or Dead Fish	Visual Observation	In the vicinity of the Pilot Study work area	Observation of any distressed, dying, or dead fish as a result of a construction activity	Stop work	Collect fish, determine species, notify EPA and NMFS. Consult with EPA on next steps.
Tide Phase/Flow Reversal	Visual Observation, Feet per second	Compliance boundary	Visual observations of the river tidal phase, in particular, periods of reversed or upstream-directed currents, Representative spot measurements of river velocity	None	Confirm tidal predictions and the orientation of background, early warning, and compliance stations Confirm flow direction

Notes:
1. If field parameter monitoring results exceed trigger, then the same field parameter will be measured within 30 minutes of the determination of the exceedance to confirm the exceedance. If the exceedance is confirmed, then additional controls discussed in Section 3.6 will be implemented. If the exceedance is not confirmed in two rapid and successive follow-up measurements, then monitoring will continue on the existing schedule. Additionally, any second measurement would be conducted if there is reason to believe the monitoring equipment is not accurate/needs to be re-calibrated, and that any repeat measurement would be performed immediately.

2. Trigger is exceeded where downcurrent conditions exceed the specified amounts relative to the event-specific background measurements and in consideration of Willamette River baseline conditions.

iii. Water Chemistry Monitoring

The water chemistry monitoring schedule includes the following:

- Intensive schedule: Monitoring will occur during all rounds performed (i.e., every 2 hours) on Days 2, 4, and 6 from the start of each major construction activity. If the activity takes less than 1 week to perform, at least two representative samples will be collected.
- Routine schedule: 1 sample per week for the remainder of work unless a water chemistry sample exceeds an acute water quality criterion, in which case, reestablish intensive monitoring

If there are no exceedances of any acute water quality criteria during the intensive monitoring period, chemical monitoring will be reduced to a routine schedule consisting of one sampling event per week for the remainder of that activity, unless a water chemistry sample exceeds an acute water quality criterion, in which case, intensive monitoring shall be reestablished.

EPA will be notified of any acute water quality exceedances at the compliance boundary. If acute water quality criteria are exceeded at both the background and compliance stations, EPA will be consulted to determine an appropriate path forward and monitoring schedule. Water quality parameter triggers and the associated work restrictions and contingency response actions are summarized in and Table 4.

The turnaround time for providing draft analytical results to EPA is 3 working days (72-hours) from receipt of samples at the analytical laboratory unless otherwise approved by EPA

Table 4: Water Quality COC Triggers

Parameter	Unit	Location	Trigger[1,2]	Work Restrictions	Action Triggered
Benzo(a)anthracene	µg/L	150 feet downcurrent of the existing reconfigured oil containment and absorbent booms at compliance boundary	Acute[3]—9.2 Chronic[3]—2.2	Acute—Add/modify BMPs Chronic—Evaluate BMPs	Acute—Notify EPA, inspect construction and add/modify BMPs, revert to intensive monitoring schedule. Chronic—Evaluate effectiveness of existing BMPs
Benzo(a)pyrene			Acute[3]—4.0 Chronic[3]—0.96		

1. Trigger is exceeded where downcurrent conditions exceed the specified amounts relative to the event-specific background. The results from the preconstruction background survey will be considered when evaluating an exceedance.
2. PAH acute and chronic values from Procedures for *Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures (EPA 2003).*

6. Water Quality Exceedance

i. Exceedance of Visual Monitoring Criteria

If visual monitoring criteria are exceeded, the following contingency actions will be implemented:

- Turbidity Observed
  - – Determine if the turbidity plume is attributed to the construction activity or other activities occurring within the river (e.g., wind waves, boat wakes, barge/ship traffic, etc.).
  - – Determine if the turbidity plume is of sufficient extent (i.e., extends beyond the compliance boundary) and sufficient duration to trigger a response action.
  - – If the turbidity plume is attributed to the construction activity and is of sufficient extent and duration (1 hour or more), begin turbidity monitoring within the plume at the point of compliance to determine if the visual exceedance is also an exceedance of turbidity criteria.
  - – If turbidity criteria are exceeded, inform the CQAO and EPA.
  - – Immediately retake measurements at all depths at the non-compliant station to confirm the exceedance. If no exceedance occurs, retake measurements within 45 minutes of initial reading to confirm the pass. If the pass is confirmed, inform EPA of resolved exceedance.
  - – If an exceedance is confirmed, inform EPA of exceedance and identify plan for implementing BMPs. BMPs for specific construction activities are listed in Section 3.6.4.
  - – Chemical monitoring will revert to the intensive monitoring schedule.

- Sheen/Oil Observed
  - – Determine if the observed petroleum contamination is attributed to the construction activity.
  - – Characterize the petroleum contamination as “minor sheen,” “substantial sheen,” or “oily plume.”
    - • If a minor sheen is identified, continue work with no restrictions while continuing to monitor the sheen to ensure it does not worsen and become substantial.
    - • If a substantial sheen is identified related to the construction activity, stop work, notify EPA, inspect construction, and add/modify BMPs as necessary.
    - • If an oily plume is observed (contiguous, heavy, and persistent oily release), stop work, notify EPA, and deploy the spill response team.
    - • Restart activities upon approval from EPA.
    - • Distressed, Dying, or Dead Fish Observed

ii. Exceedance of Field Parameters

If conventional parameters (turbidity, temperature, pH, and DO) are exceeded at the compliance boundary during construction activities, the following actions will occur:

- Determine if exceedance is attributed to the construction activity or other activities occurring within the river (e.g., wind waves, boat wakes, barge/ship traffic, etc.).
- If the exceedance is attributed to the construction activity, inform the CQAO.
- Immediately retake measurements at all depths at the non-compliant station to confirm the exceedance. If no exceedance is confirmed, then construction can recommence. A third set of measurements will be taken within 45 minutes of initial reading to confirm the pass. If the pass is confirmed, inform EPA of resolved exceedance.
- If an exceedance is confirmed, inform EPA immediately of exceedance and identify plan for implementing BMPs.
- If an exceedance is confirmed, chemical monitoring will revert to the intensive monitoring schedule.

iii. Exceedance of Water Chemistry Parameters

If acute or chronic (based on a 4-day average) chemical criteria are exceeded, EPA will be notified as soon as possible upon receipt of the analytical data. NW Natural and EPA will discuss if BMPs need to be modified and what additional BMPs may need to be implemented to minimize the potential for any future exceedances of acute chemical criteria, and intensive chemical monitoring will be restarted. Because water chemistry results require a longer turnaround time, it will be difficult to use such results to manage the construction operations in "real time," but these results will be used to help manage construction BMPs through the duration of the Pilot Study. "Real time" management decisions will, by necessity, rely primarily on conventionals measured in the field. BMPs will also be evaluated if chronic values are exceeded continuously for more than 4 days running if it is determined that this is not a baseline condition using contemporary background and historical (e.g., RI/FS) data.

7. Effects on Fish

If construction operations result in conditions causing distressed, dying, or dead fish, then the following actions, at a minimum, will be taken:

- Stop work and notify EPA and NMFS within the first hour of such conditions.
- Collect fish specimens and record the following, at a minimum:
  - Condition of fish (dead, dying, decaying, erratic, or unusual behavior)
  - Number, species, and size of fish in each condition
  - Location of fish relative to operations
  - Presence of any apparently healthy fish in the area at the same time
- Inspect construction activities and add/modify additional BMPs as necessary.

- Restart activities upon approval from EPA

Additional water quality measurements may need to be taken at the discretion of EPA and are intended to define the area of impact and assess the situation to allow informed decisions. The cause of any water quality problem will be assessed and appropriate measures (e.g., change production rates) will be taken to correct an identified problem.

C. **Summary of Best Management Practices (BMPs)**

Best management practices (BMPs) for this project have been reviewed and approved by EPA for each of the activities affecting water quality and are presented in Appendix C of the Revised ISS FPSWP. Implementation of these BMPs will be directed by the NW Natural, their contractors, and EPA to avoid and minimize environmental impacts. The activities covered by these BMPs include:

- General Construction Physical, Mechanical, and Operational Control BMPs
- Enhanced BMPs for Controlling Water Quality During ISS Sediment Treatment Activities
- Enhanced BMPs for Controlling Water Quality During ISS Post-Treatment Swell Material Removal
- Swell Barge Loading and Transport BMPS
- Swell Barge Dewatering and Amendment BMPs
- Transloading and Transport to Upland Disposal Facility BMPs
- Timber Dolphin Removal BMPs
- Temporary Ramp Installation and Removal BMPs

D. Emergency/Contingency Measures:

1. NW Natural has prepared a Spill Control Plan (Appendix D of the ISS FPSWP). This plan provides preventive measures to avoid/contain a release, and corrective actions for mitigating any release during the In Situ Stabilization and Solidification Field Pilot Study. This Spill Control Plan will be updated throughout the duration of the contract if necessary, to reflect actual site conditions and practices, subject to the EPA approval.

2. Any work that is out of compliance with the provisions of this CWA §404 ARAR Memo, or conditions causing distressed or dying fish, or any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, is prohibited. If these occur, NW Natural (i.e., the construction operator) shall immediately take the following actions:

- Cease operations that are causing the compliance problem.
- Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage.
- Immediately notify EPA's RPM: Hunter Young (503) 326-5030; young.hunter@epa.gov.

- In the event of finding distressed or dying fish, the applicant shall collect fish specimens and water samples in the affected area within the first hour of the event. These samples shall be held in refrigeration or on ice until the applicant is instructed by EPA on what to do with them. EPA may require analyses of these samples before allowing the work to resume.
- In the event of a discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, containment and cleanup efforts shall begin immediately and be completed as soon as possible, taking precedence over normal work. Oregon Emergency Response System (800-452-0311) shall be notified immediately. Cleanup shall include proper disposal of any spilled material and used cleanup materials.
- Submit a detailed written report to EPA within five (5) days that describes the nature of the event, corrective action taken and/or planned, steps to be taken to prevent a recurrence, results of any samples taken, and any other pertinent information.

3. The contractor will follow the Spill Control Plan (Appendix D of the ISS FPSWP). The contractor shall have spill cleanup materials and an emergency call list available on site.

4. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills.

PREPARED AND APPROVED BY:

Hunter Young

9/28/2023
Date

Hunter Young