STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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April 21, 2020

Shane DeGross
BNSF Railway Company
605 Puyallup Avenue
Tacoma, WA 98421

RE: Ecology comments on draft BNSF/Wishram Railyard *"Initial Investigation Work Plan Addendum"* Report:

- **Site Name:** BNSF Track Switching Facility aka Wishram Railyard
- **Site Address:** 500 Main Street, Wishram, Klickitat County
- **FSID No.:** 1625461
- **CSID No.:** 230
- **Agreed Order:** DE 12897

Dear Shane DeGross:

Thank you for the submittal of the above-referenced draft work plan in accordance with Agreed Order DE 12897. I have had recent discussions with the Yakama Nation regarding the BNSF Track Switching Facility Site (Site). Per treaty, the State of Washington recognizes the Confederated Tribes and Bands of the Yakama Nation as a sovereign political entity. This Site is located along the shores of the Columbia River within a treaty 'usual and accustomed' fishing area. Tribal members exercise treaty reserved fishing rights on the shores of or in the Columbia River in the direct vicinity of the railyard. As such, I am integrating their input into the decision-making process by submitting their full comments regarding your draft work plan.

I am also submitting updated comments provided by Chance Asher, Ecology's Sediment Policy Program Lead. I provided her initial comments earlier as an attached memorandum in Ecology's letter dated October 4, 2017. As you may know, both Chance and Teresa Michelson are contributing authors to the Sediment Cleanup User's Manual as well as having ample requisite experience to comment on these matters. Thus, I am deferring to their expertise in helping inform the continuation of the sediments investigation.

The general message from both sources is that the inundated lands investigation completed to date is insufficient to meet the regulatory requirements of the Sediment Management Standards (SMS). Please address your response to these comments directly to me, consistent with the Agreed Order and as part of the administrative record. Indicate whether BNSF intends to incorporate Ecology's recommendations and please state what actions you will take to comply.

As you may also be aware, the granting of a Consent Decree is not a foregone conclusion. The State of Washington may enter into that type of agreement at Ecology's discretion based on relevant items such as its evaluation of the sufficiency of the investigations.

You can reach me at (509) 454-7836 or (509) 731-9613 or John.Mefford@ecy.wa.gov if you have any questions regarding this letter.

Sincerely,

John Mefford

John Mefford, LHG
Cleanup Project Manager
Toxics Cleanup Program
Central Regional Office

Enclosures (2): 1 - Technical memo dated March 26, 2020 from Teresa Michelsen, Yakama Nation to John Mefford, Ecology
2 - Memo dated April 13, 2020 from Chance Asher, Ecology to John Mefford, Ecology

cc: Chance Asher, Toxics Cleanup Program, Department of Ecology
Allyson Bazan, AGO Ecology Division
Brooke Kuhl, BNSF Railway Company
Teresa Michelsen, Avocet Consulting LLC
Matt Wells, Tupper Mack Wells PLLC

TECHNICAL MEMORANDUM

March 26, 2020

TO: John Mefford, Ecology

CC: Laura Shira, Bob Dexter, Rose Longoria, Yakama Nation Fisheries

FROM: Teresa Michelsen, Ph.D.

RE: BNSF Wishram Railyard, Comments on the Initial Investigation Work Plan Addendum

This memorandum provides Yakama Nation's comments on the BNSF Wishram Railyard Initial Investigation Work Plan Addendum, addressing additional work to be carried out in the inundated lands area offshore of the railyard. We acknowledge that BNSF has carried out some initial field studies in the inundated lands. However, it is our view that neither these studies nor those proposed in the Work Plan Addendum meet the requirements for an initial investigation of sediments offshore of a MTCA site under the Sediment Management Standards (SMS).

1. INTRODUCTION

Page 1, Regulations and Guidance. The introduction refers to the SMS, Chapter 172-204 WAC and the Sediment Cleanup User's Manual (SCUM) in several places. However, the Conceptual Site Model (CSM) and proposed investigations are not in conformance with the rule or guidance. Confusingly, the Work Plan presents other CSM and project approaches derived from EPA guidance and BNSF internal approaches. However, this is not a Superfund site, and the approach directed by SCUM is incompatible in many respects with the proposed scope of the investigation, chemicals of potential concern (COPCs), and the sampling and analysis methods described in this work plan.

Sediment sites are generally handled as a separate site unit from upland sites and have their own decision processes, CSMs, COPCs, and characterization methods. Conclusions based on upland sampling are used throughout BNSF's draft work plan to limit the scope of the investigation, which is inappropriate for an initial investigation of an area of sediments adjacent to, and formerly part of, an industrial site. Detailed comments on these inconsistencies are provided below.

1.1 Site and Area of Interest. The "area of interest" is not a term used in the SMS and is certainly not limited to the small red square shown in Figure 1-1. The study area should include

any areas of inundated lands formerly adjacent to the railyard site and any deeper submerged areas into which outfalls or other potential sources of contamination may have discharged. The current investigation, along with historical records, has confirmed that the area adjacent to the active railyard was used for at least some disposal or dumping of waste or spilled materials. As this NAPL waste area was recently unknown and only fortuitously discovered, additional waste disposal areas may be present that are currently unknown and not necessarily linked to upland contamination through an active transport pathway.

In addition, multiple pipelines discharge or discharged into the inundated lands and potentially beyond to the original shoreline of the river. Any such areas should be included in the initial investigation study area, based on an appropriate CSM of potential existing and historical sources.

1.2 Project Objectives. These project objectives are limited and out of sync with an initial investigation of a sediment area under the SMS (see SCUM, Section 3.1.1). The objectives of an initial investigation under SMS are to:

- Identify station clusters of potential concern
- Identify and list sediment sites based on exceedances of the CSL criteria
- Gather initial information on sources, contaminants of concern, chemical concentrations, and extent of contamination.

As stated in Section 3.1.1, "such sampling and analysis must be sufficient to establish whether there are exceedances of the CSL criteria for site listing purposes..." The CSL criteria include all chemicals listed in Table 8-1 of SCUM and WAC 173-204-563. This is the main objective of the initial investigation.

It is insufficient for the project objectives of an initial investigation under SMS to address incremental refinement of a single accidentally identified area of contamination offshore for only a limited set of analytes.

2. CHARACTERIZATION STAGE CONCEPTUAL SITE MODEL

Page 2, CSM Numbered Steps. SCUM provides clear guidance on development and refinement of the CSM for a sediment site in Section 3.3, moving from the initial investigation through the remedial investigation and into the feasibility study, remedial action, and monitoring. This guidance should be used to establish an appropriate CSM that guides the initial investigation activities, each of which should be designed to fill an identified data gap.

The offshore CSM cannot rely on the upland CSM to limit an initial investigation, as many historical pathways at industrial sites no longer exist and are not discoverable through upland investigations. Instead, a sediments CSM is based on knowledge of industrial and other land uses, COPCs typically associated with these uses, potential and confirmed historical and existing pathways to the inundated and submerged lands, and any existing sediment data. At the initial investigation stage of the process, the CSM is broadly based and focused on filling data gaps to obtain a more complete screening level evaluation of sediment contamination rather than limiting the areas of investigation or the COCs. A determination can then be made regarding whether a sediment site exists that requires further investigation and cleanup.

Pages 2-3, CSM bullets. This CSM is limited to the small waste disposal area identified through recent sediment sampling that was not the original target of investigation activities. More such areas may be present. In addition, as noted above, other historical pathways exist and additional COPCs are associated with railyards with repair facilities that have not yet been included. Even with this limited CSM, the last four bullets represent premature conclusions based on a very limited area and duration of investigation.

It is too early to conclude that the source of sheen in the river is due to isolated offshore deposits. The pattern of sheen suggests a shoreline source, although there has been insufficient mapping and discussion of sheen observations to date to support a conclusion. A single short-duration field effort is not conclusive in ruling out episodic upland impacts to surface water. The riprap along the shoreline may have limited the ability of the nearshore survey to identify the presence or absence of impacted soils/groundwater behind or within the riprap that could give rise to occasional sheen. At this time, it appears most likely that there are both shoreline and offshore sources of sheen.

Irrespective of sheen, a comprehensive CSM should be developed that identifies all past and present potential and confirmed pathways to sediments. Potential pathways include exchange with river water through the berm; outfalls, oil pipelines, pumphouses, and other possible discharges; overland flow from contaminated soils to the river, and direct dumping or disposal in areas now inundated. The initial investigation should be designed to sample and either rule out or confirm each of these potential pathways to sediments with sufficient sampling data for comparison to site listing criteria (CSLs).

3. PROJECT APPROACH

Page 3, 1. The area of evaluation should include the inundated lands generally and the specific potential source areas, including at a minimum the identified NAPL deposit, the shoreline showing evidence of sheens, and each of the existing or former discharge pipes at the point of

discharge. Sampling should be sufficient to identify additional hot spots that may exist due to former waste disposal practices. Background concentrations of COPCs can be evaluated in the initial investigation, or more cost-effectively delayed until the COCs are refined for the Remedial Investigation.

Page 3, 2. The list of analytes is insufficient under SMS and SCUM for an initial investigation of an area with almost no sediment data. All sediment sites are analyzed for a base list of contaminants, consistent with the multivariate analysis used to develop the SMS freshwater sediment criteria. Identification of COPCs can only be based on existing information if there is existing information for sediments (not just for uplands).

SCUM Section 3.3.6.1 describes the procedures when there is limited or no sediment data. The guidance states "When there is no or very little data for the sediment at a site, the CoPCs should err on the side of inclusiveness for the initial phase of sampling. All standard SMS benthic chemicals (Table 8-1) should be measured, along with any additional analytes associated with processes at the site. Table 4-1 (Chapter 4) lists chemical classes and some specific analytes associated with various types of industries that should be considered."

Similarly, in SCUM Section 4.2.1, the opening sentence states, "The list of analytes should include the SMS chemicals and conventional parameters (Chapter 8, Table 8-1), as well as any additional chemicals suspected to be present such as other bioaccumulative chemicals. "The SMS chemicals" means all chemicals in Table 8-1.

In other words, when there is no sediment data, all chemicals in Table 8-1 shall be analyzed. This is the default COC list. The list may be narrowed somewhat, but not extensively, to the basic minimum that is analyzed at all sediment sites: TOC, grain size, metals (except butyltins), PAHs/semivolatiles (8270), TPH-D and TPH-R, and PCB congeners. Phthalates should be added for municipal and industrial stormwater and sewer outfalls. Pesticides/herbicides should be added if these chemicals were used for vegetation control at the site. Required sediment volumes, preparation and analytical methods, and detection limits are listed in SCUM Appendix D.

The SMS rule also requires that bioaccumulative chemicals be considered. SCUM Section 3.3.6.1 states with respect to bioaccumulative chemicals, "Most sites will have sources of PAHs and historical sources of PCBs, and therefore these groups should be included among the CoPCs." Note that PCBs are essentially always measured, because they are on both the default benthic list and the BCOC list, and are among the most frequently detected sediment contaminants after PAHs.

It's worth noting that this is the same process that the federal and state dredging agencies use to determine a COC list for initial dredging in an area that has not been sampled before, except that there is an even longer list of required analytes (56 in total), plus any additional industry-specific ones.

Page 4, first paragraph. Ten centimeters is the default biologically active zone (BAZ) for marine sediments, based on extensive benthic community analyses in Puget Sound showing that 95% of marine benthic organisms live in the top 10 cm. This value is not applicable to freshwater sites, which can have widely varying BAZs depending on the environment. The BAZ should be determined by a qualified agency or consulting biologist and the basis for the selected depth described in the work plan.

Section 3.1, second paragraph. The Triad approach as described and proposed in this work plan makes extensive use of field characterization technologies to make real time decisions in the field. This may be appropriate to an initial look at sediment contamination of specific types, but is not usable for regulatory decision-making and does not cover all the COPCs. SMS criteria require analyses using specified methods and detection limits, collected using standardized field techniques, with rigorous QA/QC. As the most important goal of an initial investigation is to determine whether sediment site identification criteria are exceeded, the data used for that purpose must be collected using the same methods used to develop the criteria and in sufficient amounts to be statistically defensible.

Section 3.1, last paragraph. Yakama Nation is a sovereign government, not a stakeholder. Yakama Nation's previous comments have not been integrated into this work plan to any substantive degree, so please remove statements suggesting that the work plan revisions have taken these comments into account.

Section 3.2, Project Deliverables. This highly focused investigation is not sufficient to determine whether the inundated lands sediments exceed site listing criteria, and therefore insufficient for completion of the remedial investigation or to support a feasibility study.

4. PROJECT TASKS

Table 4-1. As noted above, the purpose of this investigation needs to be better defined according to SCUM guidance and a complete initial investigation conducted. Therefore, this table will look quite different. However, some initial comments are as follows.

Here and in the comment-response tables there appears to be some confusion as to the use of the bioassay data. At this point, the inundated lands are still in the site identification phase.

Therefore, if a bioassay override is to be invoked by the PLP or required by Ecology, bioassays should be conducted on samples that include the highest-concentration samples to determine whether benthic effects in the three highest-concentration samples exceed the CSL. At least 10 samples should be subjected to benthic testing, including samples from the most-impacted areas.

The problem is that this investigation is mixing different phases of the process, and therefore the goals and interpretation procedures are confused. Some areas and COPCs have not been investigated at all. Others have undergone exploratory analyses but have insufficient samples collected using the SMS process to make a site determination. Some of the stated purpose in this work plan and in the response to comments suggests that BNSF is jumping ahead to site boundary delineation and remedial design.

It is correct to say that because sheens are occurring that violate water quality standards, these areas will need to be remediated regardless of further sediment investigations. However, water quality violations are a separate regulatory matter from sediment criteria exceedances, which is the purpose of the bioassays. Because several samples have exceeded sediment criteria even with the limited chemical analyses already conducted, the sediments would qualify as a site under SMS – unless bioassays are conducted in the most contaminated areas and pass the benthic toxicity criteria. Even then, bioaccumulative contaminants would need to be assessed.

Table 4-1 indicates that the purpose of the surface sediment samples is to support sediment cleanup site identification. This is appropriate for this stage of the process. However, to conduct sediment site identification, the bioassay samples need to be collected from all the same areas and stations as the surface sediment samples so that the highest-concentration samples can be subjected to bioassay analysis.

In the comment response matrix, BNSF's contractors pointed out that for benthic impacts, data are interpreted on a point-by-point basis. However, this is for steps occurring after the remedial investigation is conducted, such as for site boundary identification or compliance monitoring following remediation. Even then, the data set is also viewed as a whole and a specific number of exceedances is allowed based on statistical considerations, similar to the site identification process. The stations are first interpreted on an individual basis, then reviewed as a group to see if they exceed site identification criteria or compliance monitoring guidance, depending on the part of the process you're in. Therefore, a statistically representative data set with sufficient samples is required for both site identification and compliance determinations.

A single upstream sample is insufficient to determine background concentrations. Please review SCUM Sections 10.2.2 and 10.3.2 for methods to assess natural background and regional

background for freshwater sediments, respectively. Appendices F and I provide additional information on the statistical methods that are expected to be applied. Because this is a fairly complex and data-intensive process, it is recommended that background evaluations be conducted in a later phase of the investigation once all areas of concern and COPCs have been identified, to allow focusing in on the specific COPCs that may have relevant background concentrations.

Section 4.1.1. Phase 1 Characterization. The TARGOST approach is a field screening approach that cannot be used for site identification. For this purpose, Ecology requires that data be collected in the same manner and with the same analyses and units as were used to develop the sediment criteria. SCOs and CSLs applicable to DNAPL deposits include total PAHs, TPH-D, and TPH-R, with appropriate cleanup procedures. These measurements have the strongest statistical correlation to benthic toxicity in bioassays for petroleum contaminants.

In addition, among bioaccumulative contaminants, cPAH TEQ should be calculated and PCB congeners should be included among the analytes due to the potential for railyard oils to contain PCBs.

This type of rapid field analysis is more appropriate in the remedial investigation phase of the project when preliminarily delineating the nature and extent of the deposit. It is fine to conduct these evaluations alongside the site identification process, but the analytes needed for site identification should be prioritized.

Therefore, the TARGOST step-out procedure should be considered an exploratory analysis and not decisional. It cannot be used to delineate the boundaries of deposits or areas that would need to be addressed during the site investigation or cleanup. Any specific thresholds that may be discussed will need to be confirmed against the above chemical analyses. Therefore, it may be prudent to err on the site of lower thresholds for real-time decision-making, to ensure that any areas identified include all areas that may later need to be remediated.

This procedure ideally would be used to locate any additional NAPL deposits that may be present in the inundated lands or beyond, including areas offshore of the terminus of outfalls. Due to the likely origin of any such deposits, there is no clear way of locating them other than to use a field exploration method such as this to systematically cover the inundated lands. A statistically based approach designed to identify hot-spots should be used.

Phase 2 Characterization

Confirmatory Sediment Borings. Confirmatory sediment borings that are collected should be analyzed for the SMS parameters mentioned above to confirm sediment impacts.

Surface Sediment Samples. See previous comment on the BAZ.

Metals and PCBs are routinely analyzed at all sediment sites, as they are, in addition to PAHs, the most common COPCs found in sediments. Metals and PCBs are often found in sediments due to direct disposal, spills, or outfall pathways that are not associated with sources of upland contamination and thus cannot be ruled out based on an upland CSM. Table 4-2 does not provide sufficient information to rule out the presence of metals or PCBs in sediments, as it presumes that the only possible pathway to sediments is surface soils, and that current surface soil concentrations are similar to past surface soil concentrations. Table 4-2 should be removed.

Areas offshore of outfalls, particularly the repair shop discharge(s), may be as significant a concern as the DNAPL deposit identified previously. There are historical records of repeated oiling of the shoreline area that suggest that housekeeping practices were similar to many other isolated industrial facilities of that era, with waste oils and other products discharged directly to the river. TARGOST should be deployed in these areas to locate any residual petroleum along with the standard suite of SMS analytes. Sewage and stormwater outfalls are common sources of sediment contaminants and should be evaluated. Three samples total distributed among these outfall terminus areas is insufficient and may miss contaminated areas, especially since it is uncertain exactly where they discharged. At least three samples should be located offshore of each outfall. This is an insufficient number to conduct a separate site evaluation but should give an indication of whether there are issues that need to be followed up on.

Sediment Bioassays. Please specify that bioassays would be performed on these samples if they exceed the SCO or at the site manager's discretion. Bioassays must be conducted within the holding time of 2 weeks to be valid for SMS decision-making purposes. In general, chemical and bioassay analyses are conducted simultaneously for this reason, as there is usually not enough time to complete chemical analyses within the holding time. The SAP should include laboratory QA/QC protocols and data validation methods specific to bioassays.

Section 4.3 Data Evaluations and Reporting. Upon completion of the initial investigation, the CSM should be updated and a data gaps evaluation conducted for the RI/FS, assuming the area exceeds site identification criteria. The RI/FS should be organized around filling data gaps in the

updated CSM to determine the areal and vertical extent of contamination exceeding sediment criteria, establish a site boundary, and identify site-specific cleanup standards.

WASHINGTON DEPARTMENT OF ECOLOGY

April 13, 2020

TO: John Mefford, CRO, TCP

FROM: Chance Asher, Information and Policy Section, TCP

SUBJECT: Comments on the BNSF/Wishram Railyard *Initial Investigation Work Plan Addendum*, updated March 13, 2020

This memo is in response to your request for technical review of the Inundated Lands Initial Investigation Work Plan Addendum, updated March 13, 2020 (Work Plan Addendum). This was a review with an emphasis on ensuring compliance with the Sediment Management Standards (SMS), consistency with the Sediment Cleanup User's Manual (SCUM), and identifying fatal flaws or red flags. Below are the identified issues followed by suggested recommendations.

To provide useful and actionable comments on the Work Plan Addendum, I also reviewed the Inundated Lands Initial Investigation Report, May 30, 2019 (II Report). Based on my review of the II Report, it appears the goals of the sampling were to provide evidence to conclude that:

- There is either a lack of NAPL or that any observed NAPL does not pose a risk.
- NAPL-related chemicals of concern are below SMS benthic criteria.
- The area does not meet the criteria of a sediment site.

While these goals are sufficient for an Initial Investigation, the conclusions in the report and the framework and goals of the Work Plan Addendum read as a Remedial Investigation.

The sediment area should be investigated as a whole. When results are analyzed as such by combining the 0-0.5 foot core and surface sediment grab sample results, this area meets the SMS criteria of a sediment site for TPH-Diesel and TPH-Residual (Table 1 below). The number and spacing of stations in the II Report is insufficient to conclude that the nearshore is not a sediment site and artificially separating results and conclusions to nearshore vs offshore is inappropriate. In addition, the chemical analysis is limited to 0-0.5 feet of the core which excluded proving chemical contamination at depth.

Table 1. Average of the three highest concentration stations in 0-0.5 feet core and grab samples. Blue shading indicates a sediment site for the listed chemicals of concern.

Sample-ID	TPH-Diesel (mg/kg)	TPH-Residual (mg/kg)	Sample Depth (feet)
J260-GS-080818	12,700	31,000	0-0.5
D200-GS-080718	459	1,380	0-0.5
D240-GS-080618	180	781	0-0.5
Average	13,219	11,053	
SMS CSL	510	4,400	

Therefore, I recommend the Work Plan Addendum be revised to fulfill the requirements of a Remedial Investigation with the following goals (SCUM Chapter 3, Section 3.1.2):

- Filling data gaps and refining the conceptual site model.
- Confirming sources of contaminants, releases, and fate and transport into the environment.
- Determining whether the sources of contamination have been controlled.
- Identifying chemicals of concern which include NAPL and any railyard-related chemicals.
- Identifying the nature and extent of contamination.
- Determining site boundaries.
- Developing cleanup standards.

Given this recommendation, below are detailed comments that are intended to provide a path forward to meet the initial requirements of a Remedial Investigation.

Conceptual Site Model. The conceptual site model in the Work Plan Addendum, and previous documents, are based on EPA guidance which is not necessarily compatible with the SMS and SCUM. The CSM should also include:

- The sediment portion as part of the site, and the site would include the upland portion and a sediment cleanup unit (rather than a "sediment site" or "area of interest"). The sediment cleanup unit should have a stand-alone CSM developed based on the requirements in the SMS and SCUM Chapter 3 and investigated on a broader scale than currently written in the Work Plan Addendum.
- The full suite of SMS chemicals (SMS rule, Table VI), cPAHs, and PCB congeners should be included to ensure all potential chemicals of concern (CoCs) related to activities at the railyard are investigated to fully understand risks posed to the benthic community, higher trophic levels, and humans.

- Identification of all complete and incomplete receptors and exposure pathways. This includes benthic, higher trophic level, and human receptors.
- Identification of all current and historical sources of CoCs, which should extend beyond sources of NAPL and NAPL-related chemicals. The study area should extend beyond that in the Work Plan Addendum (Figures 1-1, 1-2 etc.) to address any impacts to sediment from railyard-related activities on the now inundated lands (e.g., from accidental or intentional dumping and disposal activities, wastewater and/or stormwater outfalls, docks) which may extend beyond any upland NAPL sources.

Sufficiency of sampling. The conclusion that NAPL was not present in the nearshore, therefore seep migration from upland sources has/is not occurring, and NAPL sheens are migrating from the offshore deposit cannot be strongly supported by this limited data set. This is due to lack of adequate sampling within the nearshore areas where intermittent NAPL sheening has been observed closer to the shoreline, overall insufficient number of core and grab sampling stations closer to the shoreline, lack of analyses below 1.5 feet, and lack of surface sediment sampling upstream and downstream of this limited NAPL-affected area. In addition, the Work Plan Addendum omits additional sampling in the nearshore or upstream and downstream of this limited NAPL-affected areas which needs to be corrected. Recommendations include:

- Targost stations. Stations should be added within the nearshore area where intermittent NAPL sheening has been observed (II Report Figure 3-3) as well as upstream and downstream to rule out any potential impacts from historical railyard- or NAPL-related activities.
- Core sampling stations.
  - Issue: Core samples were taken offshore where the presence of NAPL was observed while on the boat and one core sample (D200-GS-080718) was taken in the nearshore area where small-extent NAPL sheens were observed in 2017 and DART %RE was >10% (II Report Figure 3-3). This core sample showed TPH-Diesel at 459 mg/kg which exceeds the SMS Sediment Cleanup Objective. The number of core samples in the nearshore area is insufficient and chemical analysis below 1.5 feet is lacking for cores where NAPL was observed (J260, F360, G200, G260). Considering the area is a gaining water body for a few months of the year, contaminated groundwater and soil could be past or current sources.
  - Recommendation: Core sampling should be done within the areas where intermittent NAPL sheening has been observed (at least three) and at stations with the highest DART %RE. Any core sample that has visible NAPL observed should be analyzed for chemistry at 0-0.5 feet and 0.5-1.5 feet.
- Surface grab sampling stations.
  - Issue: Five grab samples were taken in the nearshore, but appear to be limited to four sampling stations at the outer edge of the area where small-extent NAPL sheens were observed in 2017 and one outside this area. However, grab samples were not taken

within the nearshore area where intermittent NAPL sheening has been observed (II Report Figure 3-3) nor upstream and downstream of this limited NAPL-affected area to investigate potential sediment impacts from other railyard-related activities. The Work Plan Addendum (Table 4-2) states surface sediment samples will be taken in the vicinity of suspected former outfalls, within the NAPL-affected area, and in areas outside the area of impact but potential locations are not identified.

- Recommendation: Identify the potential locations of surface sediment samples within and outside the NAPL-affected area. A minimum of an additional five surface samples should be taken within the nearshore area where intermittent NAPL sheening has been observed. In addition, surface sediment stations upstream and downstream of this limited NAPL-affected area should be taken along the nearshore to rule out other contamination from railyard-related activities. The total number of surface samples must be sufficient to represent impacts to the benthic community and an area-wide mean for impacts to humans and upper trophic levels.
- Issue. A default biologically active zone (BAZ) of 10 cm has been identified in the Work Plan addendum. Freshwater sediment ecosystems have diverse BAZs so assuming a default without evidence is not appropriate.
- Recommendation. Either an analysis to establish the BAZ should be done or an assumption that it may extend up to two feet should be made and chemical and bioassay analysis done at 10-15 cm intervals.
- Issue: The Work Plan Addendum Table 4-1 states bioassays will be conducted when one or more stations exceed the Sediment Cleanup Objective AND the average of the three highest stations exceed the Cleanup Screening Level.
- Recommendation: Bioassays should be conducted on stations that exceed the Sediment Cleanup Objective, if the goal is to override chemistry results (e.g., a chemical exceedance is void is bioassays pass SMS criteria). Holding times in SCUM Chapter 5 should be strictly adhered to and, if this holding time cannot be met, bioassays should be run before the time has expired.
- Issue: The background/reference station is insufficient to establish background and information about the reference area and potential sources is lacking.
- Recommendation. Sampling from a reference area, which would be roughly equivalent to background in the SMS rule (WAC 173-204-560), should be an upstream sampling location that is removed from point sources for the site CoCs. In this case, those CoCs would likely be cPAHs, PCB congeners, and metals. Approximately 10 samples should be taken and analyzed to calculate background values. Since the sample number is small, background should be calculated using the 95th UCL on the mean.

Analyte List.

- Issue: Sampling and analysis to identify all potential CoCs from site related activities and source areas was not conducted. The analysis for this initial investigation was limited to total PAHs, TPH-Diesel, and TPH-Residual. The Work Plan Addendum states that PCBs and metals should not be analyzed because upland soil concentrations were below the SMS benthic criteria. That may be applicable to current soil conditions but it is not representative of past upland soil concentrations, soil concentrations of now inundated land, historical spills and dumping, and other railyard-related activities.
- Recommendation: All chemicals of concern that may have been released from multiple potential sources and activities at the site should be identified which requires more sampling and analysis. For example, the site had transformers—a potential source of PCBs—and sewer/storm lines near pump houses draining to the river—a potential source of multiple chemicals. The full suite of SMS chemicals should be analyzed (SMS Table VI) as well as carcinogenic PAHs, and PCB congeners (reported as sum TEQs; SCUM II, Chapter 6). Practical quantitation limits (PQLs) should be low enough to limit the number of non-detects (below potential background/reference area concentrations) and meet QA/QC requirements in SCUM II, Chapter 5.

NAPL Seep Migration and Sheen Movement.

- Issue: The II Report concludes that the direction of NAPL movement is from offshore to nearshore with the reasoning that offshore NAPL is the source of nearshore sheening. However, the data appears insufficient to rule out upland/shoreline sources to the nearshore or potential contamination at depth in the nearshore. The mobility of observed NAPL was analyzed from two core samples G260-GS and G200-GS (II Report Figure 2-2) and the II Report concludes that offshore NAPL is not mobile and the NAPL sheening is due to gas ebullition in calm, low-water, and warm air temperature conditions. However, the sheening observations are not sufficient and the core samples used to conclude this were from low concentration cores.
- Recommendation: Additional investigation may be necessary to understand if the upland/shoreline is a source to the nearshore. In addition, the sediment cores with the highest chemical concentrations should be included in the test for NAPL mobility (e.g., J260-GS and D-200-GS).

DART/TPH correlation. The DART responses that strongly correlate with TPH concentrations from grab samples is interesting, but incomplete (II Report Figure 3-2). Four of six grab sample stations were either collocated or near DART stations and grab samples were only located near DART stations with either "low %RE" or "very low consistent with background of <10%RE" (Figure 3-3). With a limited data set (N=6) that is not consistently collocated or tested over a wider range of %RE, I suggest the conclusion that DART technology is an effective indicator of TPH concentrations is a tentative one.