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Subject: Response to DEQ Comments on the May 7, 2021 Draft Source Control Evaluation Work Plan  
Crawford Street South Site  
8524 North Crawford Street  
Portland, Oregon  
ECSI# 2363  
File No. 006209-010-01

Dear Kevin,

This letter responds to comments on the May 7, 2021 *Draft Source Control Evaluation Work Plan* (SCE Work Plan), for the Crawford Street Site (ECSI #2363) in Portland, Oregon. The comments were prepared by the Oregon Department of Environmental Quality (DEQ) and U.S. Environmental Protection Agency (EPA) and sent on July 16, 2021. For ease in reviewing our responses, the DEQ and EPA comments are provided below in italics, followed by our response in regular font.

The responses also identify revisions made to the SCE Work Plan in response to comments. A revised SCE Work Plan is transmitted with this response to comments letter. Of note, Cascadia Associates was recently acquired by GeoEngineers, Inc. The SCE Work Plan is still in Cascadia format because it was initiated prior to the acquisition.

## **RESPONSE TO DEQ COMMENTS**

DEQ provided general and specific comments. Our responses and proposed revisions to the SCE Work Plan in response to the comments are provided below.

### **General Comments**

DEQ General Comment 1: *Section 5.2 of the work plan discusses the installation of nine groundwater monitoring wells at the site. Figure 13 shows the proposed placement of the wells. As currently proposed, the placement of the wells leaves a coverage gap along the top of the riverbank between MW-2 and MW-4. The stormwater drainage map (Figure 9) indicates that stormwater runoff from basin "E" discharges over the riverbank in this location. A 10<sup>th</sup> monitoring well should be added along the top of the riverbank*



between MW-2 and MW-4 to fill in the coverage gap and to evaluate the effects of stormwater infiltrating in that area.

**Response:** An additional well will be added in the approximate location of surface water sampling point SW-4, shown on Figure 9 of the SCE Work Plan. This location is shown as MW-10 on Figure 13 in the revised SCE Work Plan.

DEQ General Comment 2: Section 5.2.1 of the work plan states that groundwater samples from the monitoring wells will initially be analyzed for all chemicals of interest. “The analytical program for the remaining three monitoring events will be developed based on the results of the first groundwater monitoring event. Analytical suites . . . that are not detected or for which the constituent concentrations are below [levels of concern] will not be included in the quarterly monitoring analytical program for the remaining events.” One round of sampling is not a sufficient basis to support reducing the analytical testing suite. The work plan should anticipate analyzing all groundwater samples for all COIs for four quarters. DEQ may agree to reductions in the analytical testing suite in the third or fourth quarters if certain chemicals or classes of chemicals remain below levels of concern.

**Response:** The SCE Work Plan has been revised to state that groundwater samples will be analyzed for Site chemicals of interest (COI) and the analytical program may be reduced for the third and/or fourth quarter monitoring based on results of the first two quarterly events and in conjunction with discussions with DEQ. Because the 2017 Portland Harbor Superfund Site (PHSS) Record of Decision (ROD) does not include cleanup levels for dioxin/furans, this suite of constituents will be included in the first quarterly event and further analyses of groundwater samples for dioxin/furans will be made in discussion with DEQ based on the first quarter results.

DEQ General Comment 3: As noted by EPA, the vertical extent of contamination below the riverbank leave surface is a data gap that is not addressed in the current work plan. Depending on the outcome of the Basis of Design Report, this data gap may need to be addressed in the future to design the riverbank source control measure.

**Response:** Noted; please also see our response to DEQ Section-Specific Comment 6, below.

DEQ General Comment 4: DEQ recommends that an interim source control measure for the stormwater pathway be considered for the site. Construction of an interim source control measure, such as berms/curbs to eliminate off-site flows prior to redevelopment, would obviate much of the need for additional stormwater evaluation and analysis.

**Response:** We agree that this would be an expeditious and environmentally sound approach to addressing stormwater on an interim basis until the long-term stormwater management program can be integrated with site development. The SCE Work Plan has been revised to propose this solution.

### DEQ Section-Specific Comments

DEQ Section-Specific Comment 1: Section 2.5.1. The last sentence of the *Preliminary Assessment – 1999 to 2002* section should reference Section 2.5.7 instead of Section 2.5.6.

**Response:** Noted—thank you.

DEQ Section-Specific Comment 2: Section 2.5.6. DEQ clarifies that, consistent with determinations at several other Portland Harbor sites, stormwater that is observed to “infiltrate into the bank” is considered discharge. As such, DEQ considers stormwater from sub-basins B, C, D and E to discharge over the bank, requiring control or further evaluation. Any discharges of stormwater off-site, even into adjacent treatment facilities, require control or further evaluation.

**Response:** Understood.

DEQ Section-Specific Comment 3: *Section 3.2 Chemicals of Interest.*

- *Please add semi-volatile organic compounds to the list of COIs.*
- *Please provide a comprehensive list of all COIs for the site, which can include acknowledgement of those which apply only to specific pathways.*
- *Please ensure that dioxins/furans are included as a COI for the stormwater pathway.*

**Response:** Section 3 has been revised to include the above requests.

DEQ Section-Specific Comment 4: *Section 3.4 of the work plan lists both a “stormwater discharge to the river” contaminant migration pathway and an “overland flow” pathway. These are effectively the same stormwater pathway. Please revise to one category of overland flow stormwater discharge.*

**Response:** We feel it is important to separate these pathways in the discussion, as the intent is to distinguish stormwater that flows via a conveyance system to discharge to the river through an outfall from stormwater that may migrate off site and discharge to the river via overland flow. At this site, there is no conveyance system; therefore, the “stormwater discharge to the river” is an incomplete pathway. Overland flow is a potentially complete pathway. Section 3.4 has been revised to better clarify these distinctions.

DEQ Section-Specific Comment 5: *Section 4.0. The extent of soil contamination exceeding Remedial Action Levels and/or Principal Threat Waste thresholds below the riverbank leave surface, and the potential presence of subsurface sources of contamination leaching to groundwater, are data gaps that should be noted in this section.*

**Response:** As noted in our response to Specific Comment 8, moving proposed wells MW-5 through MW-8 to the outermost top of the riverbank will allow the wells to be installed through the riverbank fill and provide results characterizing the “riverbank fill leaching to groundwater” pathway. As noted in our response to Section Specific Comment 6, below, the leave surface characterization, once completed, will be in conformance with the EPA’s River Bank Guidance: the lateral and vertical extent of leave surface soil with COIs at concentrations exceeding remedial action levels (RALs) and/or principal threat waste (PTW) threshold levels will be sufficiently defined to complete remedial design of the river bank source control measure (RBSCM). Section 4.0 of the SCE Work Plan has been revised to identify these data gaps and how they will be addressed.

DEQ Section-Specific Comment 6: *Section 4.1.2 should include an explanation of how riverbank areas with contaminants exceeding Remedial Action Levels/Principal Threat Waste thresholds from Table 21 of EPA’s 2017 Portland Harbor Record of Decision will be addressed in conformance with EPA’s River Bank Guidance.*

**Response:** Section 2.2 of the Riverbank Guidance states (page 15):

“If surface results exceed PTW threshold values, which are NAPL, highly toxic PTW, and not reliably contained (NRC) PTW thresholds listed in Table 1, subsurface sampling is necessary to vertically bound contamination exceeding PTW threshold values to the depth appropriate to support remedial action design.”<sup>1</sup>

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<sup>1</sup> Emphasis added.



We anticipate that the characterization of the anticipated leave surface performed for the riverbank SCE will be sufficient to support design of the proposed RBSCM and, therefore, the work will be in conformance with the River Bank Guidance.

DEQ Section-Specific Comment 7: Section 4.1.3. To clarify, notification to the State Historic Preservation Office should occur before field work is conducted, as described in Section 7.1.(2) of the Consent Order.

**Response:** Noted. Reference to the State Historic Preservation Office has been removed from Section 4.1.3 and added to the Sampling and Analysis Plans.

DEQ Section-Specific Comment 8: Section 4.2. The proposed groundwater monitoring wells are upgradient of the riverbank, leaving the riverbank soils leaching to groundwater pathway as a data gap. Consider angling some of the top of bank monitoring wells beneath the riverbank to address this data gap.

**Response:** Installing angled monitoring wells is not recommended as the wells can be difficult to install and maintain. To ensure that the riverbank soil leaching to groundwater pathway is adequately assessed, proposed wells MW-5, MW-6, MW-7, and MW-8 will be moved to the edge of the top of the riverbank, to the extent practicable and accessible. That will place these wells on or near the downgradient edge of the former lumber mill structures previously present at the site and well within the filled area of the riverbank, as the historic riverbank was filled beneath these structures during and following demolition of the buildings. Figure 13 of the SCE Work Plan has been updated to illustrate the revised locations of the monitoring wells. We note that these wells will be installed in the proposed layback area of the RBSCM and would need to be decommissioned before construction of the RBSCM was initiated.

Wells MW-1 and MW-2 are located within or directly adjacent to black sand fill areas, and therefore will provide representative results for evaluating the leaching to groundwater pathway from the black sand fill and the other fill used to construct the riverbank in this area. Riverward of these locations, the riverbank is comprised of very large concrete debris and sampling/installing wells in these areas would be difficult to impossible without destabilizing the slope.

DEQ Section-Specific Comment 9: Section 4.3.3 should note that there are data gaps in the stormwater sampling data. In addition to the data gap for PCBs described in EPA's comments, site stormwater samples were not analyzed for DDx or dioxins/furans, as shown on Table 13.

**Response:** The intent of Section 4.0 is to identify the data gaps that would preclude making a determination whether a source control pathway is complete and may present an unacceptable risk to the river. As identified in Section 4.3.3, previous data support that stormwater management is needed, i.e., the pathway is complete and may present an unacceptable risk to the river if not appropriately managed on an interim basis until the site is redeveloped and long-term management is implemented. Therefore, no further characterization is proposed; rather the SCE Work Plan proposes to move this pathway directly into evaluation of an interim Source Control Measure (SCM). Identifying dioxin/furans and DDx as data gaps in Section 4.3.3 would be confusing to the reader as it would suggest that further characterization of stormwater is needed prior to making the determination whether an SCM is needed.

We note that the stormwater samples were analyzed for polychlorinated biphenyls (PCBs) and that a sample of stormwater running onto the site was analyzed for dioxin/furans. Section 4.3.3 has been revised to identify that previous stormwater samples were not analyzed for DDx and that one run-on sample was analyzed for dioxin/furans.

DEQ Section-Specific Comment 10: Section 5.1 Riverbank.

- a. *Given the heterogeneous nature of the soil contamination and the previous detections of dioxins/furans in riverbank samples, dioxins/furans should be added to the list of analytes for all soil samples to complete characterization of the eastern area of the upper riverbank and the launchable toe leave surface.*

- b. *The first paragraph at the top of Page 36 should describe the applicable sampling methodologies, rather than refer to a Sampling and Analysis Plan that is not included with the current work plan.*

**Response:**

- a. Although we disagree that including dioxin/furans analyses at all of the launchable toe sampling locations and at locations XS10-70 and XS13-70 will significantly enhance the understanding of the character of the leave surface relative to the high cost for these analyses, dioxin/furans analyses at the launchable toe locations and at XS10-70 and XS13-70 have been added to the analytical program.
- b. The information provided on the top of page 36 is to inform the reader that what is being proposed is consistent with what was performed in the past. As stated in the third paragraph from the top of page 36, the methodologies for the sampling and analyses are provided in the Quality Assurance Project Plan (QAPP) (Appendix A); they are also discussed in the Riverbank Sampling and Analysis Plan (SAP) (Appendix B). Both the QAPP and the Riverbank SAP are included as appendices in the SCE Work Plan. The SCE Work Plan has been revised to clarify that the information provided on the top of page 36 is informational and that the methodologies are contained in the QAPP and the Riverbank SAP.

DEQ Section-Specific Comment 11: *Section 5.3. In DEQ's experience at other sites in Portland Harbor, back-to-back storms late in the rainy season (Jan-Mar) also produced stormwater runoff and observable overland flow.*

**Response:** Noted.

DEQ Section-Specific Comment 12: *The Willamette Cove and Cathedral Park Sediment Management Areas should be included on the riverbank transect figures (Figures 6, 7, 8, 10 & 11).*

**Response:** The Willamette Cove and Cathedral Park Sediment Management Areas have been included on the riverbank transect figures (Figures 6, 7, 8, 10 and 11) in the revised SCE Work Plan.

DEQ Section-Specific Comment 13: *Table 12. Portland Harbor Cleanup Levels and source control screening criteria should be referenced, rather than RBCs.*

**Response:** It appears that an outdated version of the table was used; we appreciate your catching this error. The revised SCE Work Plan includes a version of Table 12, which incorporates Portland Harbor Cleanup Levels and source control screening criteria.

DEQ Section-Specific Comment 14: *Figure 12. Please include the proposed additional sampling locations on the cross-sections.*

**Response:** The step-out locations near XS1-TOE, XS11-50; and XS12-40 that are in-line with the transect have been added to the cross-sections. Step-out locations near XS11-50 and XS11-72 that are perpendicular to transect XS-11 have also been plotted; although because of the two dimensional view of the cross-section, the two step-out locations, which are on either side of the transect, appear as one location on the transect. However, the depiction at least provides the reader with a visual understanding of the proposed sampling depths relative to the previous results.

The step-out locations at XS1-TOE and XS12-40 that are perpendicular to the transect will plot on top of locations XS1-TOE and XS12-40 on the cross-sections and will not be visible; therefore, these locations have not been added to the cross-sections. Table 15 identifies the sampling depths at these locations.



DEQ Section-Specific Comment 15: Appendix C (Groundwater Sampling and Analysis Plan).

- Modify to include the installation of 10 monitoring wells, and sampling and analysis for all groundwater COIs for four quarters.
- Obtaining well start cards should be included in Section 3.1.
- Portions of Section 3.3 are inconsistent with Oregon Water Resources Department rules (e.g., surging the wells prior to installation of the well seals). Please state that the wells will be installed per OWRD rules (Chapter 690, Division 240).

**Response:** The Groundwater Sampling and Analysis Plan has been modified as follows:

- The SAP includes 10 wells and is revised consistent with our response to General Comment 2.
- Section 3.1 identifies that well start cards will be obtained.
- Section 3.3 states that the wells will be installed per Oregon Water Resources Department (OWRD) rules (Chapter 690, Division 240).

DEQ Section-Specific Comment 16: Appendix D (Health and Safety Plan). The HASP should be signed on Page i.

**Response:** The HASP is signed in the final plan.

DEQ Section-Specific Comment 17: Appendix J is currently a second copy of the Evergreen Environmental Management report in Appendix I. Appendix J should be a copy of the 2016 Focused Subsurface Investigation Report from EVREN Northwest.

**Response:** The revised SCE Work Plan includes a copy of the 2016 *Focused Subsurface Investigation Report* from EVREN Northwest. We appreciate you catching this error.

## RESPONSE TO EPA COMMENTS

### Primary Comments

1. Stormwater Assessment: The stormwater source control assessment should consider all contaminants with Portland Harbor Superfund Site Record of Decision (ROD) cleanup levels (CULs) for surface water (EPA 2017). Historical data provides much of the chemical characterization data needed for this assessment; however, there are no stormwater data for DDx despite historical exceedances of the CULs and Remedial Action Levels (RALs) in other media at the site. EPA understands that the planned stormwater assessment will not include analytical sampling at this time, but the lack of stormwater DDx data should be acknowledged as a data gap which may need to be filled at a later date.

**Response:** Section 4.3.3 has been revised to identify that stormwater was not analyzed for DDx and, depending upon the selected interim SCM, stormwater analysis for DDx may be needed to complete the SCM.

2. Section 4.1.3 Summary of River Bank Pathway Data Gaps: Given that the proposed sampling is limited to depths around the expected leave surface, the vertical delineation of COCs exceeding PTW thresholds, required by Section 4.1.2 of the River Bank Guidance, is considered a data gap for informing design decisions. EPA acknowledges that the scope of work is intended to complete characterization of the leave surface and understands that the river bank source control measure (RBSCM) will be designed so that visible black sand fill will be removed prior to or during the layback.

However, EPA expects that the vertical extent of contaminants exceeding PTW thresholds that continue below the leave surface be bounded in order to inform the RBSCM design and to ensure consistency with the Portland Harbor Superfund Site ROD and the Remedial Design Guidelines and Considerations. Given the heterogeneity of the bank fill, delineation of continuous RAL exceedances extending below the leave surface should be considered to better inform the RBSCM design.

The second paragraph of this section should be revised to state that the objective of this work plan is characterization of the leave surface, rather than complete characterization of the entire river bank. The vertical extent of contaminated material left in place beneath the leave surface will remain a data gap until bounded. EPA recommends vertical delineation of PTW exceedances be completed prior to bank layback. This will allow for a more streamlined and strategic approach for any necessary removal of continuous PTW exceedances and black sand fill.

**Response:** The second paragraph of Section 4.1.3 has been modified such that the first sentence now reads: “Once the characterization of the *anticipated* riverbank *leave surface* is complete by filling the data gaps identified above, a Basis of Design Report (BODR) for the RBSCM will be prepared...” (the italicized words have been added to the sentence in the revised SCE Work Plan).

We note that Section 4.1.2 of the Riverbank Guidance is inconsistent with Section 2.2, which states on page 15:

*“If surface results exceed PTW threshold values, which are NAPL, highly toxic PTW, and not reliably contained (NRC) PTW thresholds listed in Table 1, subsurface sampling is necessary to vertically bound contamination exceeding PTW threshold values to the depth appropriate to support remedial action design.”<sup>2</sup>*

We anticipate that the characterization of the anticipated leave surface performed for the riverbank SCE at the site, which characterizes 2- to 6-foot depth intervals at most locations, will be sufficient to support design of the proposed riverbank SCM.

3. Section 4.3.3 Summary of Stormwater Evaluation and Identified Data Gaps: Polychlorinated biphenyls (PCBs) data in stormwater should be identified as a data gap. The PCB results shown in Table 13 indicate that laboratory reporting limits are orders of magnitude higher than the surface water CUL; therefore, there is no way to confirm whether the non-detect results are below the CUL. PCB congener analysis should be conducted to chemically characterize site discharge, which is the analytical approach performed for other PHSS work.

**Response:** As identified in our response to DEQ General Comment 2 and Specific Comment 6, additional stormwater characterization is not needed at this time because the sampling performed to date is sufficient to address the objective of the stormwater SCE, which is to identify whether the stormwater pathway is complete (it is) and whether a SCM is needed to address stormwater (it is). DEQ’s recommended approach to berm the Site to prevent stormwater from flowing offsite has been added to the SCE Work Plan and an ISCM work plan detailing this approach will be prepared.

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<sup>2</sup> Emphasis added.



Therefore, the detection limits for the previous PCB analyses relative to recent PHSS ROD CULs are not considered a data gap for this purpose.

Section 4.3.3 has been revised to state that samples were analyzed for PCB Aroclors and the detection limits were above the CULs in the 2017 Portland Harbor ROD. We do note that other Portland Harbor sites have recently proposed and received EPA approval for PCB Aroclors analysis (e.g., the Willamette Cove Pre-Remedial Design Investigation).

4. Section 5.1 Sampling to Characterize Launchable Toe Leave Surface: EPA recommends analysis of the deeper sample at each location for dioxins/furans regardless of the results of the shallower samples. The surface sediments are dynamic, and therefore not a conclusive measure of likely contamination in the subsurface.

**Response:** The SCE Work Plan has been revised to include analysis of the deeper launchable toe samples for dioxin/furans.

#### Response to EPA “To Be Considered Comments”

1. Section 3.4 Potentially Complete Source Control Pathways, Erosion of Riverbank Soil: The discussion about the Erosion of Riverbank Soil pathway is too limited in scope and detail. This section should be supplemented with a brief summary of the RBSCM meant to control this pathway and a brief overview of the plan to complete leave surface characterization. This section should have a similar level of detail to the discussion of the other potential pathways.

**Response:** The intent of Section 3.4 is to briefly identify the potentially complete pathways at the site. The level of detail is approximately similar to the other identified pathways in this section. The need for a riverbank SCM and supporting characterization work is described in Sections 2.5.3 through 2.5.5 of the SCE Work Plan and further detailed in the various leave surface characterization work plans, copies of which are contained in Appendix L of the SCE Work Plan.

2. Section 4.3.1 Stormwater Drainage: Rationale should be provided for the statement, “The Site grade has likely changed since the stormwater drainage basins and discharge locations were mapped.” The Site history provided in Section 2.2 does not indicate that any changes were made to site topography. Based on the Site history, it appears that information collected during the 2007, 2012, and 2013 stormwater assessment reports in Appendix O could be used to support the SCE.

**Response:** Section 4.3.1 provides the rationale for the above statement, which is as stated:

“The stormwater drainage basin details, stormwater surface flow patterns, and discharge locations noted during stormwater assessment activities, were observed between 2007 and 2013, at least eight years ago.”

The statement quoted in the EPA comment is not definitive; it simply says that it likely has changed. Eight years is a long time and the grade of an unpaved parking area can change subtly over time sufficient that stormwater movement will be different and discharge points may have changed. If an interim SCM is to be developed to prevent stormwater from flowing off of the Site, an accurate and current understanding of surface water movement across and off of the site is needed. We note that the information provided in Appendix O was used to complete the SCE, the results of which indicate



that an interim SCM is needed until site development occurs, which will include a long-term stormwater management program.

3. Section 4.3.2 Stormwater Characterization Data:

- a. Stormwater Sampling: EPA recommends that the following text be removed: “screening Site stormwater data that may never discharge to the river against ROD CUL and JSCS SLV likely overestimates the risk to the river.” Comparing site analytical data to screening levels is one line of evidence to assess risk and is not, alone, considered a risk assessment. The text is misleading, as the comparison to ROD CULs and JSCS SLVs, where no CUL is established, is an important consideration when developing the CSM.
- b. SW-1 Discharge from Basins A: EPA disagrees with the conclusion that the 2007/2008 data is more representative of stormwater because there were less total suspended solids (TSS) in the discharge. The misleading text should be justified or removed, and all available data should be considered in the source control evaluation. Changing flow patterns and storm event characteristics may also impact TSS concentrations, and TSS removal is often used as a design parameter as a surrogate for contaminants.

**Response:**

- a. While we disagree and believe it is important for the authors of the report to be able to have and express their technical opinion, we have revised the SCE Work Plan to remove this sentence to expedite approval of the work plan and implementation of the work.
  - b. The intent of this paragraph is to identify for the reader that the stormwater results appear to be highly influenced by the amount of TSS in the sample. This information is important in the evaluation and selection of an interim SCM. The text has been revised to clarify this point.
4. Section 5.3 Stormwater: The SCE WP should provide additional detail describing the visual observations to be performed, type of data to be collected, documentation required, and limitations to this approach. For instance, the text states that observations will be used to confirm the volume of stormwater runoff that would need to be addressed through an interim source control measure (ISCM). However, there is no discussion of flow measurement methods, required equipment, or quality control. This section should be revised to describe the type of data needed to initiate the ISCM Work Plan and the specific protocols to be followed for collecting this data to meet necessary quality standards.

**Response:** The DEQ has suggested an interim SCM of berming the upland portion of the Site to prevent stormwater flow from the Site. The SCE Work Plan has been revised to include this option and identified that a ISCM work plan will be prepared which provides details of its implementation.

5. Appendix A Quality Assurance Project Plan (QAPP): The QAPP should include a section that discusses the data summation methods used to calculate total PCBs, PAHs, cPAHs, dioxins/furans, DDx and chlordanes. Tables should include notes to clearly show how individual analytes are summed in the calculation of totals. Providing a discussion in the text and tables to clearly demonstrate the calculations used to sum analytes is helpful for the reader/reviewer of the report, improves the data quality objectives (DQOs), and allows for a meaningful comparison of the results with the CULs. For detailed summation rules, refer to the Program Data Management Plan (EPA 2020).

**Response:** The QAPP has been revised to note that data summation will follow the EPA's *Program Data Management Plan*, which we understand will be re-published in August 2021 with updated summation rules.

6. *Appendix B Riverbank Sampling and Analysis Plan: EPA recommends using one (1) foot sampling intervals to correspond with standard practice in the Portland Harbor Superfund Site. Surface samples should be taken in a 0-1' interval, and subsurface sample intervals should be taken in a 1'-2' interval. This will allow the RD at Crawford Street to effectively integrate with the RD at the Cathedral Park and Willamette Cove In-Water Project Areas.*

**Response:** We respectively note that the above referenced sites are performing assessments of sediment as a part of pre-remedial design investigations (PDI) for sediment remedial action design; the Willamette Cove In-Water Project Area has not completed its riverbank characterization and, therefore, the sampling interval proposed for that effort has not yet been determined. Further, the objectives of these PDIs differ from the objectives of the leave surface characterization for the Crawford Street site. As the riverbank leave surface characterization program for the Crawford Street Site is almost complete, we believe it is important to remain consistent with the sampling approach and intervals that were approved for the previous characterization efforts so that the collected data is consistent across the site.

7. *Appendix C Groundwater Sampling and Analysis Plan, Section 3.3 Well Installation: If a direct push technology (DPT) drill rig is used to install the proposed monitoring wells, EPA strongly suggests that at a minimum, 2-inch diameter wells be constructed using pre-pack screens to achieve a higher degree of confidence in proper well construction. Due to the limited annular space when installing monitoring wells using a DPT drill rig, placement of the sand filter pack using conventional means with a slotted PVC screen is difficult to control and monitor and there is a high likelihood that well constructions may be compromised. Additionally, given the nature of the lithology of the alluvium at the target depth of installation, flowing sands in the saturated zone may cause the borehole to collapse and prevent the well screens from being installed at the desired depth interval. The use of conventional drilling and well installation methods using a hollow stem auger drill rig should be considered in order to achieve a higher degree of confidence that the objectives of groundwater monitoring well installations will be achieved.*

**Response:** A pre-packed screened interval can be installed; the groundwater SAP has been updated to reflect that a pre-pack will be adopted if a DPT rig is used. The SAP has also been updated to include hollow stem auger as a possible method for advancing the boreholes for well construction.

#### Response to EPA Matters of Style Comments

1. *Section 4.3.2 Stormwater Characterization Data, SW-2 Discharge from Drainage Basin A: The first sentence states, "Three stormwater samples were collected from discharge location SW-2 between April 2017 and March 2013" (**emphasis added**). It appears that the sentence should be revised to indicate April 2007.*

**Response:** The sentence should read April 2007; we appreciate you catching and identifying this error.

2. *Figure 5 Geologic Cross Section A-A': The figure should include a note indicating that a dashed line represents an inferred contact.*



**Response:** The dashed line in the figure represents the estimated groundwater surface. We recognized that the “SI/SA Alluvium” notation was directly on top of the dashed line suggesting that the line was an inferred lithological contact, so this notation was moved to avoid this confusion.

We appreciate the thorough review provided on the SCE Work Plan and look forward to your feedback on our responses to comments and approval of the revised work plan.

Sincerely,  
GeoEngineers, Inc.



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Principal Hydrogeologist

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