



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10

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OFFICE OF
ENVIRONMENTAL CLEANUP

May 11, 2010

Ms. Noel Mak, NPL Program Coordinator
Wah Chang
1600 Old Salem Road NE
PO Box 460
Albany, Oregon 97321-0460

**Re: EPA Comments – Crucible Cleaning Area Enhanced In Situ Bioremediation
Work Plan, Teledyne/Wah Chang Superfund Site, Albany, Oregon**

Dear Ms. Mak:

The U.S. Environmental Protection Agency (EPA) in coordination with the Oregon Department of Environmental Quality (ODEQ) has reviewed the Crucible Cleaning Area (CCA) Enhanced *In-situ* Bioremediation (EISB) Work Plan (Work Plan), dated March 29, 2010. Overall EPA supports the effort presented in the Work Plan; however, additional details are necessary to help clarify the rationale behind the Work Plan's approach to meet stated objectives and Record of Decision (ROD) remedial goals. EPA has determined that the Work Plan is to be revised to address the attached general and specific comments.

The conceptual site model for the CCA, including contaminant distribution and hydraulic and geochemical conditions is lacking. The conceptual site model forms the basis for the remedial approach, and without a clear description of the physical and chemical setting, EPA cannot approve the proposed approach. In addition, further linkage between overall cleanup objectives and performance monitoring is necessary so that data quality objectives (DQOs) can be established.

More information is also needed that would attest to the long-term success of EISB in areas of probable non-aqueous phase liquid (NAPL). EPA believes that historical sampling in the CCA maybe indicative of free product. EISB is not an effective remedial alternative for source areas with NAPL. Therefore more information must be presented from Wah Chang regarding how groundwater concentrations will be monitored 2-5 years after injection.

EPA does find that the procedures and mechanics of implementing the remedial action are well written and complete. Therefore, upon receipt of this letter, Wah Chang may begin preparation of the Make-up Water Tanks and other non-ground disturbance activities necessary for the remedial action during the interim period as the Work Plan is being revised and approved by EPA.

Lastly, in accordance with the Second Explanation of Significant Differences for the June 10, 1994, Record of Decision for the Final Remedial Action of the Groundwater and

Sediments Operable Unit, no further modification to the cleanup decision is needed and this application of EISB in the CCA may proceed following approval of the Work Plan.

Please submit a revised Work Plan within 15 working days upon receipt of this letter. Should you have any questions about the attached comments or EPAs direction to Wah Chang in this letter, please contact me at 206 553 4092 or by email at sanga.ravi@epa.gov

Sincerely,

A handwritten signature in blue ink, appearing to read "Ravi N. Sanga".

Ravi N. Sanga, MS
Remedial Project Manager
Site Cleanup Unit 3

Enclosure
cc w.enc:

Curt Black
Environmental Protection Agency

Geoff Brown
Oregon Department of Environmental Quality

Dave Livesey
GI Water Solutions

Eric Roth
Parametrix

Lee Weber
Wah Chang

US Environmental Protection Agency Comments, Teledyne Wah Chang Superfund Site, Crucible Cleaning Area Work Plan, March 29, 2010

General Comments

Development of a working conceptual site model for the Enhanced *In-situ* Bioremediation (EISB) treatment area. A discussion is needed in the Work Plan for the current contaminant distribution and fate and transport within the Enhanced *In-situ* Bioremediation (EISB) treatment area so that the basis for the design can be evaluated by EPA. Please add this discussion under Section 2 (Background) and include a description of the current conceptual site model for the CCA, including contaminant distribution, geochemical parameters, and hydraulic conditions (i.e., hydraulic gradient, estimates for seepage velocity with and without pumping FW-1, roles and implications of catch basins and blast walls). Example: The rationale for the two planned characterization boreholes (Figure A-2) is very unclear without understanding the current contaminant distribution and more justification is needed for the placement of these boreholes.

A figure with the ground-water contours at high and low water would help the reviewers evaluate the hydraulic variability of the treatment area. The significant potential role of infrastructural modifications to the area should be clearly identified and explained. The role of short-circuiting by piping and pipe chases in earlier work in the Acid Sump Area makes clear the importance of the assessment of these structures in the CCA.

Justification for characterization boreholes. Please clarify how decisions are going to be made based on the two characterization boreholes (e.g., will the injection wall be extended if chlorinated volatile organic compounds [CVOCs] are found at high concentrations. Please also add an explanation of the criteria for the lengths of Strings 1 and 2. Please also show the current distribution of CVOCs and the data upon which that distribution is based. Please add an explanation of how the 2 locations are expected to provide sufficient understanding of the distribution of CVOCs in this inhomogeneous media.

Please clarify the rationale for placement of the injection string. For instance, if groundwater flow direction is towards FW-1, as stated, please explain why the barriers aren't oriented perpendicular to the plume, or encompass flow direction.

More discussion is needed between EPA and Wah Chang regarding how characterization boreholes and monitoring wells will be advanced and constructed.

EPA is requiring that characterization boreholes and monitoring wells be advanced and constructed using rotosonic drilling techniques. EPA believes that hollow-stem auger

drilling techniques are limited in their ability to adequately characterize subsurface soils and construct monitoring wells, relative to rotosonic drilling techniques. Collection of representative soil and groundwater analytical data and water level information is critical to the working conceptual model for the CCA, and will be used to verify or modify Work Plan approach. As noted in the Acid Sump Area Design Work Plan, MIPs (membrane interface probe) and continuous soil cores were used extensively to define the nature and extent of contamination. EPA believes that the previous level of effort using MIPs and continuous soil cores Geoprobe™ system for the Acid Sump would yield better samples vs. the proposed split spoon sampling hollow stem auger system for the CCA. Methods for qualitative and quantitative evaluation of soil sampling must be specified in the plan as well.

Meeting ROD standards. Please clarify how data collected as part of this action will contribute to the objective of, *“Achieve concentrations below Record of Decision (ROD) (EPA, 1994) standards for CVOCs in groundwater within and immediately downgradient of the injection point.”* EPA assumes that this means that ROD cleanup levels would be achieved within and immediately downgradient of the CCA source area. If this is the case, how is the source area defined. If this assumption is incorrect, please explain the purpose of the objective. Please also add a table that linked objectives to planned performance monitoring. Refer to the EPA Guidance on developing Data Quality Objectives (DQOs).

More clarification is needed to clarify how the data collected as part of this action contribute to the objective of, *“Determine whether contaminant concentrations in groundwater at the CCA are likely to decline to cleanup levels within the 15-year timeframe estimated in the ROD (EPA, 1994).”*

Clarify how data collected as part of this action will contribute to the objective of, *“Create an EISB system that will continue to treat groundwater as [it] moves toward extraction well FW-1.”* Please add a table that links objectives to planned performance monitoring. Currently, no monitoring well exists between PW-93 (stated source) and extraction well FW-1 along the direction of groundwater flow. An additional monitoring well is necessary to evaluate this objective.

Figures. Please add a figure that shows current groundwater flow superimposed over injection well placement and one that shows concentrations of SVOCs in groundwater (and/or in saturated soils if data exists) superimposed over injection well locations.

Specific Comments

Section Number	Section Title	Comment
Figure 2		Characterization is spelled wrong in the legend, please correct.
3.2	Project Approach	Paragraph 2 - The Furnace Building needs to be identified in Figure 2. Please provide a description of the physical attributes of the foundation/basement wall of the furnace building and why it is considered an "effective barrier." Please explain how deep the wall is and how it penetrates the entire Linn Gravel Unit.
3.2	Figure 2	Please indicate the groundwater flow direction with and without pumping of FW-1. Also indicate any seasonal variability in gradient/flow direction.
3.2	Project Approach	Please provide either a reference and/or supporting data that the CVOC plume is indeed captured by FW-1 in reference to the statement, "Groundwater flow modeling results indicate that groundwater movement across the CCA is influenced by the operation of extraction well FW-1. Continued operation of FW-1 will provide hydraulic control of groundwater containing elevated CVOCs during injection."
3.2	Project Approach	Paragraph 4- Please reference the appropriate Appendix/Table that describes how the sump will be monitored during injections. For example, please provide detail regarding the parameters (e.g., VOCs) to be monitored and the monitoring frequency.
3.2	Project Coordination	Insert "and" between "reviewed" and "updated: "registration will be reviewed [and] updated as required".
3.2	Implementation Activities, Preliminary Field Tasks	On page 4 the work plan discusses infiltration into the basement of the Furnace Building. According to the plan, a groundwater collection sump will be

		monitored for dye/substrate breakthrough. Please add an explanation of whether the sump collects groundwater under ordinary conditions, and where it discharges to.
3.2	Implementation Activities, Monitoring Well Installation, Baseline Sampling, Make-up Water Preparation	Page 7, first paragraph, discusses installation of the two temporary borings. The plan is vague in several regards and more detail must be added. First, the purpose of the borings, beyond "to better define the distribution . . ." is not specific enough. Please explain how these two borings fit into the recent characterization efforts in the CCA. Second, there is enough info available in the area to understand local stratigraphy and depth to water. The boring states that air knifing will occur to 5 feet and that soil samples (presumably from the vadose zone) will be collected. Wah Chang must state the expected depth to groundwater and the anticipated approximate depth at which groundwater samples will be collected to demonstrate that volatile loss due to air knifing will not be a problem. More discussion on the utility of air knifing vs. rotonasonic techniques must be discussed with EPA. Also, since the general vicinity is a possible soil source area, discrete soil samples should be collected vs. composite samples. These samples should include a 1) shallow sample, 2) a sample in the soil/groundwater interface and 3) a deep sample in or near the saturated zone.
3.2	Task 3, Temporary Injection Well Installation and Injection, Substrate Injection	Page 8, paragraph 4 describes monitoring for substrate intrusion into nearby catch basins and sumps. Wah Chang must specify the catch basins and sumps that will be monitored and indicate these on a figure. Also note in the plan that this would be an excellent opportunity to spot places where groundwater may be intruding into catch basins, sumps and lines, without running analytical samples.
3.2	Task 3, Injection wells paragraph	Reference is made to the Arc Welding and Materials Recycling buildings – on the map, this building is labeled, "Arc Melting", please correct.

Ref		Include reference to the ESD for OU2.
Table 1		Please clarify when and where water levels and dye samples will be evaluated during injections.
Appendix A	Table A1	<p>Include a baseline monitoring technical memorandum under Task 3. CVOC results from baseline monitoring must be tabulated prior to installation of injection strings.</p> <p>Table A1 is incomplete and needs boxes checked for performance monitoring, which must include all parameters (i.e., CVOC, groundwater chemistry, etc).</p>