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LETTER REGARDING FEASIBILITY STUDY MEETING ACTION ITEMS FOR PROPOSED
GROUNDWATER SAMPLING LOCATIONS SOLVENT RELEASE AREA NAS SOUTH
WEYMOUTH MA
02/16/2011
U S EPA REGION I



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION I

5 Post Office Square, Suite 100
Boston, MA 02109-3912

February 16, 2011

Brian J. Helland, P.E.
BRAC Program Management Office NE
4911 South Broad Street
Philadelphia, PA 19112-1303

Re: Feasibility Study Meeting Action Items regarding the Proposed Groundwater Sampling Locations and Excavation Cost Estimate for the Draft Feasibility Study Report Follow-up Action Items for the Solvent Release Area

Dear Mr. Helland:

EPA reviewed the December 22, 2010 submittal containing two action items established during our October 28, 2010 team meeting to discuss the draft Feasibility Study Report for the Solvent Release Area. The submittal contains groundwater sampling locations proposed for additional sampling in the spring and fall of 2011 and also a cost estimate for excavation of the PCE hot spot. The primary purposes of the additional groundwater sampling are to establish more robust time series data for contamination in the plume that will facilitate more accurate modeling of the plume dynamics and to determine the extent of downgradient migration of the plume. The excavation evaluation was prepared at EPA's request because it would remove significant contaminant mass from the site in a shorter timeframe. The results for these two action items will be incorporated into the revised feasibility study and will result in a better documented and more comprehensive set of alternatives from which the final remedial action can be selected.

PROPOSED GROUNDWATER SAMPLING LOCATIONS:

1. As discussed at our October 28, 2010 meeting, additional groundwater data are needed to establish the dynamics of the groundwater contamination and to better characterize the site for future modeling and development of remedial alternatives. The locations proposed for additional sampling are primarily located in downgradient locations with the apparent purpose of evaluating the extent of and potential changes to contaminant concentrations in the leading edge of the plume. While there is value in collecting this data because of the scarcity of time series groundwater data at the leading edge, ideally, all existing on-site monitoring wells would be re-sampled in 2011. In any case, the proposed approach does not address the core of the plume which is also lacking in time series data and shows little evidence of reductive dechlorination. If reductive dechlorination is not occurring or is occurring at a minimal rate and if DNAPL is present in the source area, which is possible based on the significant PCE concentrations detected at the source area, then it is unlikely that the plume could be stable. As a result, EPA recommends that the core of the plume also be subjected to additional monitoring. Additional details are provided below.

2. The groundwater monitoring proposal devotes the majority of the resources to monitoring bedrock groundwater. Bedrock investigation should be conducted to the extent that data is collected to better understand the extent and potential movement of contamination in bedrock. However, EPA believes that because it is more likely feasible to remediate overburden groundwater and because overburden groundwater is more likely to influence potential risk (via surface water infiltration and vapor intrusion), a greater percentage of resources should be devoted to investigating that medium. Specific suggestions are included in comments, below. EPA recommends that overburden groundwater be investigated via a combination of new and existing wells. Two or more rounds of sampling need to be conducted (initially during spring and fall of 2011) to supplement the available overburden groundwater data. While it is possible that the feasibility study can be completed following the incorporation of that data, it is also possible that additional data needs could be identified pending the results of the two sampling rounds.

At a minimum, the following existing overburden wells related to the plume should be sampled: CH108-MW01, CH108-MW02, MW10-303, MW10-400, MW-401, MW10-403, MW10-405, MW10-406, MW10-407, MW-411, MW20-316, MW20-501, MW-302, and MW-304.

In addition, some background/upgradient information on groundwater quality will be required for comparison to the analytes detected when monitoring the plume wells. Specifically, EPA recommends monitoring the following (existing) background wells: MW-BG4, MW-338, and MW-03.

3. MNA Parameters; The rationale for selecting the handful of wells listed on the table entitled, "Proposed Groundwater Sampling Locations, Solvent Release Area, Spring/Fall Events," for additional analysis (i.e., various MNA parameters and related analytes) needs further discussion. In addition to the analytes proposed by Navy, EPA recommends that oxygen, ORP, and pH also be collected at each location. In addition to ferrous iron, soluble manganese would also be a good indicator of reducing conditions and therefore its inclusion should be considered. Perhaps the larger issue is that MNA data and related analyses will be of little value until the plume is understood in sufficient detail to enable selecting representative sampling locations in all key areas of the plume, along a consistent central axial flow pathway. It is unclear whether the current locations succeed in this regard. The selection of SRA-MW10-408D1 is particularly suspect for its intended purpose as an "upgradient" well given the uncertain history of contaminant trends at that location. The installation of a new, upgradient monitoring well is warranted to achieve this objective. Similarly, a suitable location(s) near the presently known "leading edge" of the plume (e.g., MW-411 cluster) is conspicuously absent in the proposal. More importantly, the potential for preferential flow in the suspected feature in the uppermost bedrock discussed in EPA's letter of December 6, 2010 needs to be fully vetted before meaningful MNA analysis can be attempted.
4. Bedrock monitoring locations; The proposed sampling locations for bedrock groundwater, with one exception, do not investigate the core of the plume. A new bedrock well cluster installed at the leading edge of the 1,000 ppm contour is recommended because of the lack of

data along the bedrock plume centerline. Also, existing wells MW10-405D1, MW10-405D2, and MW10-402 should also be monitored, particularly if the installation of a new bedrock well at the center of the high concentration area of the plume is not being considered. Additional locations where new monitoring wells in both bedrock and overburden are needed were outlined in a comment provided in EPA's letter dated December 6, 2010. This comment is reiterated below.

5. New monitoring well locations (*excerpted from EPA's letter dated December 6, 2010*):

Priority Locations for New Monitoring Wells: New overburden and shallow bedrock monitoring wells are needed. Priority one wells should be installed before spring 2011 for inclusion in the 2011 monitoring program. Priority two wells could be installed later, but ideally before the 2011 monitoring program. The locations of the proposed new wells are shown on Figure 2, Proposed New Well Locations.

- **Priority 1** -- New overburden well near the leading edge of the 1,000 µg/L contour, approximately 20 feet east of CH-GW108-04, screened above the top-of-bedrock surface. This well is to be located within the notch feature shown on Figure 1.
- **Priority 1** -- New shallow bedrock well near the leading edge of the 1,000 µg/L contour, approximately 20 feet east of CH-GW108-04, screened in the uppermost 50 feet of bedrock. This well is to be located within the notch feature shown on Figure 1.
- **Priority 1** -- New overburden well near the leading edge of the 100 µg/L contour, located on north side adjacent to the EMD, in the vicinity SW/SD-112, screened above the top-of-bedrock surface. This well is to be located within the notch feature shown on Figure 1.
- **Priority 1** -- New shallow bedrock well near the leading edge of the 100 µg/L contour, located on north side adjacent to the EMD, in the vicinity SW/SD-112, screened within the upper 50 feet of bedrock. This well is to be located within the 'notch' feature shown on Figure 1.
- **Priority 1** -- New overburden well near the eastern lateral edge of the 100 µg/L contour, approximately 150 ft. east of MW-302.
- **Priority 1** -- New shallow bedrock well near the eastern lateral edge of the 100 µg/L contour, approximately 150 ft. east of MW-302.
- **Priority 1** -- New overburden well near the leading edge of the 10,000 µg/L contour, approximately 50 feet east of MW10-405, screened above the top-of-bedrock surface.
- **Priority 1** -- New shallow bedrock well near the leading edge of the 10,000 µg/L contour, approximately 50 feet east of MW10-405, screened above the top-of-bedrock surface.
- **Priority 2** -- New overburden well, screened above the top-of-bedrock surface, approximately 30 feet east of MW10-402. This well should be located within the notch feature shown on Figure 1.
- **Priority 2** -- New bedrock well, screened in uppermost 50 feet of bedrock, approximately 30 feet east of MW10-402. This well should be located in the notch feature shown on Figure 1.
- **Priority 2** -- New overburden well located on south side of the EMD approximately 60 to 80 feet west of MW11-112, screened above the top-of-bedrock surface. This well is to be located on-strike within the notch feature shown on Figure 1.

- Priority 2 -- New shallow bedrock well located on south side of the EMD approximately 60 to 80 feet west of MW11-112, screened within the uppermost 50 feet of bedrock. This well is to be located on-strike within the notch feature shown on Figure 1.
- Priority 2 -- New overburden well near the present western lateral limits of the plume, approximately 200 ft. west of MW-302.
- Priority 2 -- New shallow bedrock well near the present western lateral limits of the plume, approximately 200 ft. west of MW-302.
- Priority 2 -- New up-gradient shallow bedrock well near MW-338.
- Priority 2 -- New up-gradient deep overburden well screened just above the top of bedrock surface near MW-338.

6. COST ESTIMATE FOR EXCAVATION OF THE PCE HOT SPOT:

1. The Navy completed a cost estimate for excavation of the PCE hot spot using very conservative assumptions for the excavation rate, even allowing for the need to dewater each bucket of soil excavated. Using a 2 CY clamshell and a 3.5 CY excavator, the Navy assumed a production rate of only 100 CY per day. A larger clamshell alone would be able to conservatively excavate 200 CY per day (allowing for bucket dewatering) cutting the production time by at least half. Nevertheless, because of the off-site disposal of excavated soil, this alternative would not likely be completed for much less than \$6,000,000. This is a high initial cost and it is not clear from the information currently available if that cost would be reasonable. Consideration needs to be given to the fact that any active groundwater remediation alternative in the absence of source removal would cost considerably more than what would typically be estimated over a 30 year evaluation period. Practically, the remediation could easily take 100 hundred years or more much more if DNAPL is present.
2. Although source removal was discussed on October 28, 2010, a potentially effective alternative to source removal is source containment. Although the Navy eliminated all containment alternatives in the draft feasibility study, it is not clear that that is appropriate. Construction of a slurry wall around the PCE hot spot is a feasible
3. technology and could potentially be constructed using a one-pass trencher to key a slurry wall into the fractured bedrock. Numerous sites have used one-pass trenchers to construct slurry walls for remediation. A 400 to 500-foot perimeter slurry wall could be constructed around the PCE hot spot (which is approximately 100 feet long by 50 feet wide) at a cost of approximately \$1,000,000, or less, replacing the costs to excavate, dewater, backfill, and dispose the excavated soil. The isolated hot spot could be remediated separately from the rest of the site potentially with a closed loop pump and treat system, an enhanced biological *in situ* treatment, or an *in situ* chemical treatment.

I look forward working with you and the Massachusetts Department of Environmental Protection on the investigation of the Solvent Release Area. Please do not hesitate to contact me at (617) 918-1393 should you have any questions or wish to arrange a meeting.

Sincerely,



Carol A. Keating, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Dave Barney, USN, South Weymouth, MA
Dave Chaffin, MADEP, Boston, MA
Kevin Donovan, SSTTDC, South Weymouth, MA
Phoebe Call, TTNUS, Wilmington, MA
Bill Brandon, USEPA

ATTACHMENT A

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Comment

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Please clarify how the « approximately 300 CY » estimate for soil predicted to require disposal at a hazardous waste facility was derived.