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LETTER AND COMMENTS FROM U S EPA REGION III ON U S NAVY RESPONSES REGARDING DRAFT SITE 1 SOIL FEASIBILITY STUDY ALLEGANY BALLISTICS LABORATORY NIROP ROCKET CENTER WV
03/04/2011
U S EPA REGION III

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

March 4, 2011

Mr. Bill Fraser
NAVFAC Mid-Atlantic
Environmental Restoration OPHREV4
Building N-26, Room 3208
9742 Maryland Avenue
Norfolk, VA 23511-3095

RE: *USEPA Comments and Navy Responses to the Draft Site 1 Soil Feasibility Study Allegany Ballistics Laboratory, Rocket Center, West Virginia*, January 2011

Dear Mr. Fraser:

EPA has finished its review of the Navy's responses to our comments on the *Draft Site 1 Soil Feasibility Study* (FS). Our comments to specific responses are provided below.

In addition, on further examination of the remedial alternative analysis provided in the draft FS report, EPA believes the former disposal pits (FDPs) should be addressed as part of the Site 1 remedial action. Although not identified as a hot spot based on the criteria outlined in the report, the FDPs are identified as a source of groundwater contamination in the Active Burning Grounds, as discussed in the April 1997 *Record of Decision Site 1, Operable Unit 3, Groundwater, Surface Water and Sediment*. The draft-final FS report should include a discussion on how the FDPs will be addressed.

Please note that EPA comments to the Navy's Response to Comments are provided in italics.

1. Please discuss the cap protectiveness factor and how this number is calculated for each of the capping scenarios presented in the report and in Table 4-2. (Page 2 of 16, Comment 1, submitted by Sun Yi)

Response: Discussion regarding the calculation of the protectiveness factor will be included in the draft-final FS report and/or Table 4-2.

Comment: Please provide the discussion on the cap protectiveness factor in the response to the comment, and prior to the issuance of the draft final FS report.

2. Please provide the source information of the values used in the SSRG Tool, especially for the fraction of organic carbon in the aquifer (groundwater foc) and the fraction of organic

carbon in soil. (Page 2 of 16, Comment 2, submitted by Sun Yi)

Response: A table has been attached to these responses describing the input parameters and providing the sources of the data. The table also shows revisions to the input parameters in response to USEPA and WVDEP comments on this FS. An additional evaluation of the vertical distribution of organic carbon was conducted following receipt of the agency comments (see attached table). Of the 143 samples on which total organic carbon was analyzed most (137) were from less than 15 feet below ground surface. The geometric mean of the foc data from less than 15 ft bgs was calculated as representative value for the vadose zone, which equaled 0.012 (g/g, unitless). The few samples (6) collected from greater than 15 ft were used for a representative estimation of the saturated zone foc. The geometric mean of the data from greater than 15 ft bgs was equal to 0.0032.

The evaluation conducted above indicates that the vadose zone foc used in the SSRG model (0.0073) was underestimated by 39 percent. However, the saturated foc value used in the model (0.026) overestimated the site concentrations by an order of magnitude. The User's Guide for the SSRG model is silent on the use of the saturated zone foc and therefore the model sensitivity to the parameter was underestimated.

Comment: EPA stresses the importance of gathering site-specific data of constituent half lives (T1/2) in calculating SSRGs. It is recommended that for each chemical, the Navy demonstrate that the conditions used in generating the T1/2 for that particular chemical are similar to the site conditions; otherwise they should default to the SSL value.

3. The PRGs for cadmium, lead, mercury, and dioxin were derived by back-calculating a soil concentration using a Hazard Quotient (HQ) of 1.0 and three different ingestion based, COPEC-specific toxicity values representing the No Observed Adverse Effect Level (NOAEL), the Lowest Observed Effect Level (LOAEL) and the Maximum Acceptable Toxicant Concentration (MATC) (Note: the MATC is the geometric mean of the NOAEL and LOAEL). Tables B.2-1 through B.2-4 indicate that the selected PRGs for these chemicals were derived using LOAEL toxicity values. These PRGs are not protective enough of their target ecological receptors because they were derived using toxicity values at which effects can be expected. MATC-based PRGs should be selected instead to ensure that unlimited future exposures to residual COPECs in soil will not result in unwanted toxic effects to wildlife receptors. The text and tables should be amended accordingly. (Page 3 of 16, General Comment 1, submitted by TechLaw)

Response: The methodology for deriving the ecological soil PRGs was presented to and accepted by the ABL Partnering Team in September 2009 and are contained in Appendix D of the draft FS, which is verbatim from the previous submittal. Since the Partnering Team and associated support staff previously accepted these soil PRG values as being adequately protective, no changes will be made to these values.

The following text will be added to the ecological PRG section of Appendix D to

justify the use of LOAEL-based values for PRGs that are based upon back-calculated food web exposures: "Although the MATC was used as the threshold to select food web COCs in the Baseline ERA (RI), mean surface soil concentrations were also used as the exposure point concentration during the COC selection process. Since the PRGs are used in the FS as risk-management values (and are thus analogous to the use of a maximum exposure point concentration), using either the NOAEL or MATC to develop the PRGs for food web COCs would result in overly conservative values. For this reason, the PRGs for food web COCs were based upon the LOAEL."

Comment: The text that will be added to Appendix D justifying use of the LOAEL-based PRG would provide a clearer explanation with the following change: "Since the PRGs are used in the FS as risk-management values ~~(and are thus analogous to the use of a maximum exposure point concentration)~~ (i.e., a not-to-exceed concentration), using either the NOAEL or MATC to develop the PRGs for food web COCs ~~would~~ may result in overly conservative values."

4. The FS identifies Alternative 3b (RCRA D Equivalent Cap, Partial Hotspot Removal, Shoreline Stabilization, and Institutional Controls [ICs]) as the preferred remedial alternative for the Outside Active Burning Ground (OABG). It is not apparent, however, that this alternative will meet all of the remedial action objectives (RAOs) defined for Site 1. Specifically, it does not appear that Alternative 3b will satisfy the third site-specific RAO for the site, which as defined in Section 3.2, Site-Specific RAOs, is to "Eliminate or control migration of [constituents of concern] COCs from soil to groundwater, in order to enhance the ability of the groundwater remedy to restore the aquifers to beneficial use." Alternative 3b includes only partial hotspot removal. Hotspots, as defined by the FS, are "those areas that have contaminant concentrations above the leaching protectiveness offered by the cap/cover alternatives" (Section 4.3, Development of Remedial Alternatives.) For the OABG, trichloroethylene (TCE) is the only COC for which hotspots associated with a RCRA D Equivalent Cap were identified (Table 4-2, Hotspot Criteria Determination for Capping Scenario). The concern for partial hotspot removal associated with Alternative 3b is that the only hotspots removed would be those that are necessary to establish stable slopes for the cover system. The most contaminated areas may not necessarily be targeted for removal. Additional TCE hotspots may remain that would not be protected by the RCRA D Equivalent Cap, and therefore continued migration of TCE from soil to groundwater could occur. Please revise the FS to address how Alternative 3b for the OABG will meet all of the site-specific RAOs, including the elimination or control of migration of COCs from soil to groundwater. (Page 4 of 16, General Comment 2, submitted by TechLaw)

Response: It is acknowledged that there are impacted soils in the OABG area (i.e., concentrations in excess of the RCRA D protectiveness factor) that would not be excavated as part of the "Partial Hotspot Removal" alternative. The analysis performed in the preparation of this FS indicates that capping of these soils in place will be protective and meet ARARs as required by CERCLA and offers the best possible remedial alternative when evaluated against the other CERCLA screening criteria. Further, this action will control potential contaminant migration from soil to groundwater (to the extent practicable) and thus "enhance the ability of the

groundwater remedy to restore the aquifers to beneficial use" in accordance with the RAOs established for Site 1.

Comment: The above response is contradictory. If the preferred remedial alternative is to cap in place the impacted soils in the OABG area, which as defined in the FS report and in the above response as soils with contaminant concentrations in excess of the RCRA D protectiveness factor, then this alternative is not protective of the human health and environment and would not meet the groundwater migration (third) RAO.

In addition, proposing a preferred remedial alternative at the feasibility study stage is inappropriate. As outlined in the EPA ***Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA****, dated October 1988 (OSWER Directive 9355.3-01), the purpose of the feasibility study is to evaluate potential remedial options which establishes the basis for a remedy selection decision. As Section 6.3 of the guidance specifies, the results of the detailed analyses performed during the FS are used as part of the rationale for selecting a preferred remedial alternative, which is presented to the public in a proposed plan. References in the FS report to a preferred alternative should be removed.*

Additionally, the Navy recommends that the RAO's be modified in order to provide more clarity and consistency. The forth RAO has be removed because it is redundant, as compliance with ARARs is already required. The draft-final FS will include the following RAOs:

- **Prevent direct contact with soil COCs at concentrations above background that pose unacceptable risks to potential industrial workers, trespasser/visitor adolescents, or ecological receptors.**

- **Prevent or minimize overland migration of COCs to the North Branch Potomac River, at levels that result in unacceptable risks to human or ecological receptors and/or exceedance of appropriate in-stream surface water quality standards.**

- **Prevent or minimize migration of COCs from soil to groundwater, in order to enhance the ability of the groundwater remedy to restore the aquifers to beneficial use.**

Comment: The ARARs included in the draft FS regarding the handling of solid waste or waste material appears to specifically refer to waste that is generated by the remedial action, and not waste that is currently present. Therefore, EPA disagrees with the proposed change to remove the original fourth RAO and that it should remain as an objective of the cleanup action. In addition, EPA requests the WVDEP be provided an opportunity to comment on the proposed change; all three parties involved in the remedial action decision should be in agreement of the RAOs.

5. In situ and ex situ chemical reduction with zero-valent iron (ZVI) is proposed as a component

of several of the remedial alternatives that involve treatment of hotspots. The FS, however, has not provided a detailed description of this treatment process (how it works, how it would be employed at the site, additional space or material requirements for the technology, and whether or not treatability studies will be necessary.) Additionally, Table 4-1, General Response Action Table, indicates that chemical reduction with ZVI has been shown to reduce chlorinated organic compounds, including TCE, tetrachloroethylene (PCE), and dichloroethylene (DCE), but it does not comment on its effectiveness with RDX and perchlorate, which are also COCs of concern at the site based on potential to leach to groundwater. It also does not appear that any post-treatment confirmatory sampling has been proposed as part of alternatives that include treatment. Please revise the FS to provide a detailed description of chemical reduction with ZVI and how it would be used at the site. Additionally, please clarify whether post-treatment soil sampling has been incorporated into the cost estimates that include this treatment process. (Page 5 of 16, General Comment 3, submitted by TechLaw)

Response: The FS text and Table 4-1 will be expanded to provide technical information on the effectiveness of ZVI at treating the Site 1 COCs. If ZVI is chosen as a component of the selected remedial alternative for Site 1, a detailed description of the treatment process and site requirements will be included in the remedial design and remedial action documentation.

The cost estimates include pre-design characterization sampling in order to establish areas requiring treatment. These data will also be used to verify the lateral extent of the cap, if such an alternative is selected. The proposed approach for the ZVI treatment includes using ten times the stoichiometric demand of the contaminants via soil mixing methods, which removes subsurface heterogeneity in the process. Based on these two assumptions, and the ultimate final remedy (i.e., landfill cap), post-treatment confirmatory sampling was assumed not to be needed.

Comment: Please note that the treatment method that is chosen to address the hotspots will need to address all the COCs identified at Site 1. Post-treatment confirmatory sampling should be assumed to be necessary, as it is required to confirm the performance of the remedy.

6. Several of the alternatives evaluated in detail include hot spot removal or hot spot treatment. A determination of what COC concentrations would constitute a hot spot under the different capping situations has been provided as Table 4-2, Hotspot Criteria Determination for Capping Scenario, and the cost estimates provided in Appendix F do include specific volumes of soil requiring hot spot removal or treatment, but no supporting documentation on how these volumes were derived has been provided. Several of the cost estimates, including the cost estimate for Remedial Alternative 4a for the Active Burning Ground (ABG), state that the volume estimates were derived from a "Hotspot figure", but these figures do not appear to have been provided. To support the hot spot volume estimates provided, please revise the FS to include figures that delineate the hot spots, and further describe how the depth and areal extent of the hot spot areas were determined for cost estimating purposes (it is noted that the hot spot areas will be further

delineated with pre-design sampling). (Page 5 of 16, General Comment 5, submitted by Tech Law)

Response: Source information from the hotspot volumes will be provided in the draft-final FS report.

Comment: Please provide a figure delineating the hot spots identified for the OABG that would be addressed under those alternatives where hot spot treatment / excavation is proposed. The grading plans in Appendix G only provide the proposed hot spot delineations for the ABG.

In addition, Figure 1-2 of Appendix G indicate that retaining walls will also be installed around Burning Pads B, C, and D, but the text (Section 5.1.3, page 5-2) states that Burning Pads A, B, and C would not be affected by the construction activities of the different proposed cover / capping scenarios for the ABG. Please address this discrepancy.

7. The alternatives evaluated in detail do not specifically address the handling of the debris and other physical waste that has been identified in the subsurface at Site 1. For example, Alternative 6 for the Active Burning Grounds (ABG) is Excavation and Off-Site Disposal, but the description of this alternative, presented in Section 5.1.7, only addresses segregating the soil by the magnitude of the constituents detected in the soil and does not identify any specific requirements for the debris. The fourth site-specific RAO for the site is: Manage debris, ash, and other non-soil materials in compliance with the appropriate State and Federal Regulations (Section 3.2). Please revise the FS to clarify how debris will be handled as part of each of the alternatives evaluated in detail, and specifically for those alternatives that involve excavation of or treatment of soil, to show that the alternatives will meet the fourth site-specific RAO noted above. Include all costs associated with meeting this RAO into the cost estimate. (Page 6 of 16, General Comment 6, submitted by TechLaw)

Response: The ABG is not expected to contain debris material; however, if debris is encountered the management will be handled in the same manner as the debris encountered in the OABG. The draft-final FS will include this approach. As stated in response to Comment 2, the forth RAO be removed because it is redundant, as compliance with ARARs is already required.

Comment: See above; second half of Response 4.

8. **Section 3.4, Site Remediation Goals (SRGs), Page 3-4:** This section describes derivation of site SRGs, but it does not elaborate on the human health-based PRGs that were calculated for the site. According to Appendix D, human health-based PRGs were calculated for three separate receptor groups: industrial workers, construction workers, and residents. Table 3-1, SRG Selection at the ABG and OABG, only identifies the Industrial PRGs. The Industrial PRGs, in many cases, are not as conservative as the Construction Worker PRGs or Residential PRGs. Please clarify why only the Industrial PRGs have been included in the SRG selection table. (Page 7 of 16, Specific Comment 10, submitted by TechLaw)

Response: Although PRGs were developed for residential and construction worker exposures, the PRGs for these groups are not applicable to the current or future land use or required to meet the RAOs. The site is an active industrial facility and cleanup to residential levels is not appropriate. Land use controls will be enforced to protect construction workers. Therefore, the industrial PRGs are the most appropriate human health risk-based PRGs for the site. The text in Section 3.4 will be expanded to include explain why industrial PRGs are appropriate for this site.

Comment: Since the Site will be used for industrial purposes, it is assumed there may be construction of buildings for future use. If so, the construction worker exposure should be considered further.

9. **Section 3.4, Site Remediation Goals (SRGs), Page 3-5:** This page identifies two cases in which COCs would not be considered remediation drivers, one of which is: "There were no maximum contaminant level (MCL) or tap water regional screening level (RSL) exceedances in the groundwater in the area where the COC was identified based on the SSRG." While this could be used as a decision criterion in areas where groundwater data are available downgradient of the SSRG exceedance, it is not necessarily applicable when the nearest groundwater data are upgradient of the SSRG exceedance. For example, Figure 2-3, Site 1 Plan View, shows that, with the exception of well 1GW04, all of the groundwater monitoring wells at Site 1 are located on the upgradient southern boundary line of the OABG. Areas with COCs above the SSRGs in the OABG may be impacting groundwater, but these COCs may not have been detected in upgradient wells. If there are data from pore water samples or surface water samples from the point of groundwater discharge downgradient of the SSRG exceedances, these data could potentially be used in support of eliminating a COC from consideration as a remediation driver. Eliminating COCs on the basis of detections (or lack thereof) in wells upgradient from an SSRG exceedance in soil does not appear appropriate. Please revise the FS to use additional data downgradient of the SSRG exceedances to support elimination of COCs. Alternatively, revise the FS to further substantiate the current decision criterion. (Page 8 of 16, Specific Comment 11, submitted by TechLaw)

Response: Groundwater at Site 1 is under pumping conditions which reverses the natural gradient along the river front. Therefore, data collected from the monitoring wells along the southern boundary of OABG are representative of the OABG area. Note that the elimination of the COCs based on these criteria had a minimal impact on the overall remedial requirements, resulting in a slight reduction in the area requiring remediation in the western OABG, due to antimony and cobalt in soil. No other areas were impacted. A schematic will be included in the draft-final version of the FS which further describes the method used for selecting remediation driver COCs the selection and evaluation of COCs.

Comment: EPA does not agree that pumping conditions are entirely effective at reversing the natural gradient along the riverfront. Even limited porewater sampling in the river sediments

indicates that under certain conditions, pumping is not capturing the entire plume. Thus, data collected from the monitoring wells along the southern boundary of the OABG may not always be representative of the OABG area. Thus, the response to the comment should be revised.

Furthermore, EPA disagrees with the above proposed methodology in the selection of COC remediation drivers.

10. **Tables 3-3B, C and D, OABG Remediation Drivers:** These tables indicate that lead is eliminated as a COC because the "constituent [was] identified as a COC only for [the] leaching scenario." This is not consistent with the HHRA COC list presented on Page 2-10, where lead is identified as a HHRA COC for the OABG. Furthermore, based on modeling conducted as part of the HHRA in the *Final Focused Remedial Investigation for Site 1 Soil, Operable Unit 4*, dated April 2006 (Focused RI), "there may be a risk associated with exposure to lead in soil at the OABG area by construction workers" (Page 6-21). The Focused RI also identified risk associated with lead in soil by the future residential receptor (Page 6-20). Please revise the FS to consistently identify lead as a COC based on human health risk, and revise the FS to establish a PRG for lead that is protective of exposure to lead in soil. (Page 10 of 16, Specific Comment 16, submitted by TechLaw)

Response: Please see response to Comment 10; there are no unacceptable risks associated with exposure to lead for the receptors considered in this FS.

Comment: See Response 8, above.

11. **WVDEP Comments and Navy Responses to the *Draft Site 1 Soil Feasibility Study Allegany Ballistics Laboratory, Rocket Center, West Virginia.*** Comment 5. Appendix C: Please include RCRA closure requirements 40 CFR 265 or 264.228 as an ARAR at the Site 1 solvent disposal impoundments.

Response: RCRA closure requirements 40 CFR 265 and 264.228 are in the process of being re-evaluated to determine their applicability at the Site 1 solvent disposal impoundments. The results of the re-evaluation will be submitted prior to issuance of the draft-final FS report.

Comment: EPA concurs with the WVDEP that 40 CFR 265 Subpart K or 264.228 should be identified as an ARAR for the Site 1 solvent disposal impoundments.

If you have any questions or concerns, please contact me at 215.814.3377.

Sincerely,

Ji-Sun (Sun) Yi
Remedial Project Manager
NPL / BRAC Federal Facilities Branch
MC: 3HS11

cc: Thomas L. Bass (WVDEP) – provided electronically
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