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

September 27, 2010

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

RE: Comments on the *Draft Site 1 Soil Feasibility Study, Allegany Ballistics Laboratory, Rocket Center, West Virginia*, July 2010

Dear Mr. Fraser:

EPA has finished its review of the above-referenced document. We offer the following comments for further consideration:

Comments Submitted by Sun Yi, EPA RPM

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.

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 f_{oc}) and the fraction of organic carbon in soil.

3. Editorial comments are provided electronically in the accompanying CD; comments are highlighted in blue, red and yellow.

Comments Submitted by Nancy Rios-Jafolla, EPA Toxicologist

1. Please provide a reference for the facility-wide background investigation that was used as alternate PRGs for some metals.

2. Note that the boundary of the areas noted as the extent of contamination should be confirmed after remediation.

3. Editorial comments are provided electronically in the accompanying CD; comments are highlighted in blue, red and yellow.

Comments Submitted by Nancy Rios-Jafolla, EPA Toxicologist

1. Please provide a reference for the facility-wide background investigation that was used as alternate PRGs for some metals.

2. Note that the boundary of the areas noted as the extent of contamination should be confirmed after remediation.

Comments Submitted by TechLaw, EPA Contractor

General Comments:

1. 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.

2. 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.

2. 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.

3. The oral cancer slope factor (CSFo) for TCE used in the derivation of human health risk-based PRGs in Appendix D, Risk-PRG Development, appears to be outdated. The source for the TCE CSFo used in the FS (1.3E-02 kg-day/mg) has not been provided but the value appears to be the 2004 California Environmental Protection Agency (Cal EPA) CSFo for TCE. The current Cal EPA value, which is also used in derivation of US EPA Region 3 Regional Screening Levels (RSLs), is now 5.9E-03 kg-day/mg (RSL Table, May 2010). Please revise the FS to utilize the most recent TCE toxicity values in the development of PRGs, or provide additional justification for use of outdated values. Please also note that reference doses (RfDs) for TCE are no longer available.

4. 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).

5. 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.

Specific Comments

6. **Section 2.4.10, Membrane Interface Probe (MIP) and FLUTe Liner Investigation, Page 2-9:** This section describes the results of a recent MIP and FLUTe Liner investigation at Site 1, but a reference to the document which provides more information on the investigation has not been provided. The FS does not evaluate remedial alternatives associated with dense non-aqueous phase liquid (DNAPL) removal/treatment based on the results of this investigation; therefore, sufficient documentation of this investigation should be provided. Please revise the FS to either include a reference to a document which presents further detail of the investigation, or provide further detail in the FS (to include locations and results from the MIP study, locations of the FLUTe liner tests, and field documentation and figures).

7. **Section 2.5.1, Human Health Risk Assessment (HHRA), Page 2-10:** This section summarizes the COCs that were identified in the HHRA for the three separate site areas. It does not, however, distinguish between surface soil and total COCs, nor does it state which COCs apply to which of the receptors evaluated. This information will be helpful when deriving PRGs for the site. Additionally, the total risks and hazard estimates calculated in the HHRA have not been provided in this section. This section also notes that a summary of COCs retained and risks identified for Site 1 soil are included in Table 6-7 of the *Final Focused Remedial Investigation for Site 1 Soil, Operable Unit 1*, dated April 2006 (Focused RI). To promote clarity, this table should be reproduced in the FS. Please revise Section 2.5.1 to provide a more complete summary of the HHRA, and identify specific COCs based on surface soil or total soil, and receptor evaluated. According to the Summary and Conclusions section of the Focused RI, "The only receptors identified in the HHRA with potential hazards or risks above EPA's target levels are the potential future child resident and the lifetime resident…" This conclusion should be included in the FS.

8. **Section 3.2, Site Specific RAOs, Page 3-2:** The first site-specific RAO addresses risks for potential industrial workers, trespasser/visitor adolescents, or ecological receptors, but it does not mention future construction workers or residential receptors. As the HHRA did not elaborate on risks to individual receptors, it is unclear whether these additional receptors need to be incorporated into the first RAO (particularly since the Focused RI only identified risks/hazards above EPA target levels for residential receptors). Please revise the FS to clarify the exclusion of construction workers and residents from the RAO.

9. **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.

10. **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.

11. **Section 3.4.1, Areas Requiring Remediation, Page 3-5:** This section states, "If the detected concentration of a COC at a sample location was more than 10% greater than the respective SRG, it was considered as part of the area of remediation for that particular COC." The FS does not describe why a 10% increase over the SRG was applied to determine areas requiring remediation, rather than selecting the SRG itself as the criterion. Please revise the FS to include the rationale for selection of the criterion used to estimate areas requiring remediation, and explain how this approach will be adequately protective.

12. **Section 3.4.1, Areas Requiring Remediation, Page 3-5:** This section states, "The areas requiring remediation were estimated by comparing the SRG for the remediation driver constituents listed on Table 3-4 to the existing soil data. This determination of exceedances is shown in Appendix B." Appendix B, Raw Data Tables, only appears to evaluate a subset of the remediation driver constituents. For example, the table titled, Eastern OABG Remediation Driver Exceedances, only compares detected concentrations of six constituents (PCE, TCE, Perchlorate, RDX, arsenic, and cobalt) to their applicable SRG. Table 3-4 shows that 15 constituents were identified in the OABG as remediation risk driver COCs. Please revise the FS to incorporate all identified remediation risk driver COCs identified in Table 3-4 into the evaluation of the areas requiring remediation. If the SRGs based on ecological risk have been excluded from this evaluation, this information should be clearly expressed, and the rationale for their exclusion provided.

13. **Section 3.4.1, Areas Requiring Remediation, Page 3-5:** The second paragraph indicates that the areas requiring remediation for the industrial scenario are shown on site figures, but "…the areas requiring remediation for the ecological scenarios at the East and West OABG were determined to be subsets of the industrial scenarios, and are therefore not shown." The FS has not provided supporting documentation to show that all of the areas requiring remediation for the ecological scenarios would be covered by the areas requiring remediation for the industrial scenario. No comparison of the soil data to the ecological-based SRGs appears to have been provided. Please revise the FS to present additional documentation to support and demonstrate that the areas targeted for remediation under the industrial scenario will also incorporate all areas requiring remediation under the ecological scenario.

14. **Table 3-3 Series, Remediation Drivers:** In several instances, a COC is eliminated as a remediation driver because the COC is considered an essential nutrient, and the maximum daily intake of the constituent is below the Dietary Reference Intake for an adult. However, the calculations of maximum daily intake and a comparison of maximum daily intake to Dietary Reference Intake have not been provided or referenced. In support of elimination of these COCs as remediation drivers, please provide daily intake calculations for essential nutrients and compare these calculated values to Dietary Reference Intakes, or provide a reference for a document which includes these calculations and comparisons.

15. **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.

16. **Table 3-3C, West OABG Remediation Drivers:** Silver is excluded as a remediation driver for combined surface and subsurface soil in the West OABG, but the rationale for its exclusion has not been provided in the "Notes" column of the table. The rationale for excluding all other constituents as remediation drivers was provided. For clarity and consistency with the approach followed for all other non-remediation drivers, please revise Table 3-3C to include the rationale for excluding silver as a remediation driver for combined surface and subsurface soil in the West OABG.

17. **Table 3-4, Remediation Risk Driver COCs at the ABG and OABG:** This table does not identify chromium as a remediation risk driver COC at the Western OABG. Chromium had, however, previously been identified as a COC remediation driver in surface soil on Table 3-3C, West OABG Remediation Drivers. Additionally, Table 3-4 does not identify cadmium or chromium as remediation risk drivers at the Eastern OABG, but Table 3-3B, East OABG Remediation Drivers, identified both of these constituents as remediation driver COCs in surface soil. Please revise the FS to address these discrepancies, and update Table 3-4 to include all relevant remediation risk driver COCs.

18. **Section 5.1.4, Alternative 4a – Modified RCRA Equivalent Subtitle D Cap, Hotspot Treatment, and ICs, Page 5-3:** The first bulleted item in this section indicates that Alternative 4a for the ABG would include treatment of soil using ex situ ZVI for VOCs and perchlorate. In Section 5.4.1, ABG Alternatives, under the Reduction of Toxicity, Mobility, and Volume through Treatment subsection on Page 5-11, it is noted that "Reduction of toxicity, mobility, and volume would occur through hotspot excavation and treatment with in situ ZVI for Alternative 4a." Please clarify if ex situ or in situ ZVI treatment is proposed for Alternative 4a, and consistently state the proposed method throughout the FS. Cost estimates for this alternative should also be consistent with the treatment to be used.

19. **Section 5.4.1, ABG Alternatives, Page 5-10:** When evaluating Alternative 2, Institutional Controls, the FS states, under the Compliance with ARARs subsection at the top of Page 5-10, that Alternative 2 "…is in compliance with the location-, action-, and chemical-specific ARARs." This statement is not consistent with the information presented in Section 5.5.2, Compliance with ARARs, where it is noted that Alternative 2 "would not meet the applicable chemical- and location-specific ARARs." Please revise the FS to resolve this discrepancy.

20. **Appendix A, Soil Screening and Remediation Goals (SSRGs) Modeling Summary for Site 1:** There are several concerns with the modeling exercise, which are summarized below:

a) The SSRG Tool allows one to enter site-specific data or use default parameters based on a specified soil type for its Pore Water Velocity Module. The FS has not described which approach was selected and did not provide the site-specific input parameters if the former approach was used. Additionally, none of the input parameters used in the Mixing Zone Depth (MZ)/ Dilution Attenuation Factor (DAF) Module have been provided for review (fraction organic carbon, bulk density, hydraulic conductivity, hydraulic gradient, etc.). In order to verify the model's output, please provide all input parameters, and either provide a source for each parameter or the rationale for its selection. Additionally, please indicate whether any of the model's default parameters were used.

b) In the Model Setup and Assumptions section, the tenth bullet states, "The water table (pre-pumping conditions) was reported consistently at 18-19 ft below land surface." This is inconsistent with the depth of groundwater described in Section 2.3.1, Geology and Hydrology, in which it is noted that depth to groundwater is 10-12 ft below ground surface (bgs) in alluvial monitoring wells. Please resolve this discrepancy and update the model as appropriate.

c) The SSRGs are calculated using the tapwater RSLs, but the model has not indicated which version of the RSLs was used. Please provide the published date of the RSLs that were incorporated into the calculations.

d) The last two columns of Table A-2, SSRGs and SSRG-Based COCs for FDPs, ABG, Western, Central, and Eastern OABG, on page 7 of 8 and page 8 of 8 of the table, are titled, "Number of Chemicals Affecting Same Target Organ" and "Adjusted HI". It is unclear how these columns relate to the information presented in the table. Please clarify the data in these columns and why these two columns are presented on this table which addresses SSRGs.

e) Subsurface debris is buried at the site, but it is unclear what impact this may have on the estimation of SSRGs for the site. Please clarify how the buried debris and heterogeneity of the subsurface is accounted for within the model.

Since many of the SSRGs were ultimately selected as site remediation goals (SRGs), additional clarification and documentation of their development is required.

21. **Appendix B, Raw Data Tables:** Several tables are grouped into this appendix, but none of them includes a specific table number. For ease of reference, please number the individual tables in Appendix B (i.e., B1, B2, etc.)

22. **Appendix D, Table B.1, Summary of Ecological Risk-Based PRGs:** Table B.1 does not list perchlorate as a COPEC while Table 3-1 (SRG Selection at the ABG and OABG) does. Please rectify this discrepancy.

23. **Appendix D, Risk-PRG Development:** There are several concerns with development of human health risk based preliminary remediation goals (PRGs), which are summarized below:

    a) The second paragraph under Human Health Risk PRGs references "agreements with the regulatory agencies" as the basis for changing some of the exposure assumptions used in calculation of the PRGs, but the specific agreements (dates, parties involved, etc.) have not been identified. Please provide more detail on the specific agreements that are referenced (dates of meetings, parties involved, etc.).

    b) Sources for toxicity data, exposure factors, and other assumptions have not been identified in the summary tables. Please provide sources for all input parameters so that they can be verified.

    c) The Particulate Emission Factor (PEF) value appears to be the same for all receptors, including the construction worker (1.32 E+09). PEFs for the construction worker scenario can vary significantly from PEFs for residential or non-residential scenarios. EPA's *Supplemental Guidance for Developing Soil Screening Levels For Superfund Sites* (December 2002), includes a specific equation for derivation of a PEF specific to a construction worker scenario. Please revise the FS to incorporate a construction worker-specific PEF.

24. **Appendix E, HELP Model:** Throughout the text of this appendix references are made to Tables C-1, C-2, C-3, etc. where the references should have been to Tables E-1, E-2, E-3, etc. Please revise the text of this appendix to correct all table references.

25. **Appendix E, HELP Model, Material Input Parameters:** The subheading "Alternative 2 – RCRA Subtitle D Cap with Soil Barrier" does not match the description below the sub header which indicates a RCRA D with GCL cover profile. Please revise the text to remove the GCL reference.

26. **Appendix F, Detailed Cost Estimates:** The following discrepancies or items requiring additional clarification were noted in the individual cost estimates provided in this appendix:

    a) Table F-1a – Detailed Cost Estimate – ABG Remedial Alternative 2: Under the Cost Component Column, there are costs associated with "Draft for Navy Review and RTC" and "Final for Regulatory Review and RTC" at the bottom of the table, but the specific documents to be developed have not been identified and the table does not indicate if these are capital costs or periodic costs. Revise this table to clarify these costs.

b) Table F-4a – Detailed Cost Estimate – ABG Remedial Alternative 5: This cost estimate should provide costs for a RCRA C Cap and Institutional Controls, but the Description of the Alternative is provided as "Localized hotspot treatment where COCs exceed their SSRGs multiplied by 50 (Modified RCRA D cap reduction in infiltration); construct modified RCRA D cap over entire ABG area requiring remediation; implementation of ICs for 30 years." Please address this discrepancy and include all costs associated with a RCRA C Cap and Institutional Controls in the cost estimate.

c) Table F-7c – FS Detailed Cost Estimate – OABG Remedial Alternative 3b: Remedial Alternative 3b consists of a Modified RCRA D Cap, Partial Hotspot Removal, Shoreline Stabilization, and ICs; however, the Description of the Alternative in Table F-7c does not accurately reflect this. The Description of the Alternative is given as "Construct soil cover over entire OABG area requiring remediation; implementation of ICs for 30 years." Revise Table F-7c to address this discrepancy and revise the cost estimates as appropriate.

d) Table F-9a – FS Detailed Cost Estimate – OABG Remedial Alternative 5: The Description of Alternative presents incorrect information for Alternative 5. Alternative 5 consists of RCRA C Cap, Shoreline Stabilization, and ICs. Revise the Description of Alternative on Table F-9a to include this description.

Minor Comments

27. **Executive Summary, Page IV:** The description of Alternative 4a for the Active Burning Grounds indicates that this alternative involves "installation of a RCRA Equivalent Subtitle D Cap with a GCL…," however, GCL has not been defined. For clarity, please define all acronyms and abbreviations the first time they are used in the document.

28. **Section 5.4.2, OABG Alternatives, Page 5-16:** Under the Cost subsection, the FS states, "Alternatives 2, 3a, 3b, 4, and 5 have approximate capital costs of $10.04 million, $11.56, $10.37 million, $15.37 million, and $10.87 million, respectively." Please revise the above statement to include "million" after $11.56.

29. **Appendix E, HELP Model:** For Alternative 1 – RCRA Subtitle C Equivalent Cap, the text does not specify the thickness of the lateral drainage layer. It appears a 0.20 inch layer was input to the HELP Model. Please include this thickness in the text description of this layer.

<u>Comments submitted by Dave Kargbo, EPA Hydrologist</u>

SSRG Tool Comments

First, as I mentioned before, it is very important that the site hydrogeologic features be thoroughly evaluated and data submitted confirmed. For example, the summary I reviewed indicates that the 3 layers that were consistently reported for Site 1 are:

1. silty clay;
2. silty to clayey sand interbedded with sandy clay; and
3. sand, clay, gravel mix.

First, this will need to be verified. Assuming these are the correct layers, I performed a simple interpretation (Table below) that indicates that the weighted average vertical hydraulic conductivity is 3 times that estimated by the Navy.

Reported layers (soil boring log)	Navy's Interpretation			Kargbo's Interpretation		
	Layer	Thickness (m)	Vertical Ks (m/y)	Layer	Thickness (m)	Vertical Ks (m/y)
Silty Clay	Silty Clay Loam	3.3	43	Silty Clay	3.3	26
Silty to Clayey sand, interbedded with Sandy Clay	Sandy Clay Loam	1.9	131	Loamy Sand	1.9	1772
Sand, clay, gravel mix	Loamy Sand	0.5	1772	Loam	0.5	197
		Weighted Ks average	224	**Weighted Ks average**		623

The vertical hydraulic conductivity (Ks) is extremely important in calculating the vertical pore water velocity which in turn affects the mean travel time through the vertical layer to groundwater. In essence, a lower Ks means a travel time that is much longer than the real travel time and may lead to a false conclusion that the contaminant will degrade in the vadose zone before reaching groundwater.

Second, I would caution against the use of the parameter values that I included in the database. As I have frequently stated, these are very old and are for illustrative purposes only. For a site as important as the ABL site, funds should be expended in generating chemical specific data (for

example, decay rates and Kd values) using site soils. In lieu of site specific data, any data used should be one that was generated with site conditions similar to the ABL site.

Finally, in their next submittals, I would like to see both the input and output files.

Thank you for the opportunity to provide comments. Please note that Kathy Patnode may provide additional comments pertaining to ecological risk considerations presented in the report and will send them to you directly in my absence. 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)
Steve Glennie (CH2M HILL)
John Aubert (NAVSEA)
Lou Williams (NAVSEA)