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Date: May 12, 2008

Ms. Linda L. Cole, P.E.
NAVFAC MIDLANT, Code EV3
9742 Maryland Avenue
Building N-26, Room 3208
Norfolk, VA 23511-3095

Re: Naval Weapons Station–Yorktown, Cheatham Annex, Yorktown, Va.
Areas of Concern (AOCs) 1, 2, 6, 7, and 8
Review of draft *Work Plan for Site Investigation – Various Areas of Concern*

Dear Ms. Cole:

Enclosed, please find the U.S. Environmental Protection Agency's (EPA's) comments pertaining to the review of the U.S. Navy's (Navy's) February, 2008 draft *Work Plan for Site Investigation – Various Areas of Concern* for the investigation of Areas of Concern (AOCs) 1, 2, 6, 7, and 8 located at the Naval Weapons Station-Yorktown Cheatham Annex (CAX) NPL site:

GENERAL COMMENTS

1. The draft SI Work Plan indicates in Section 3.2.2, Sampling Rationale, Page 3-6 that "... a bias toward locations with the greatest potential for contamination as well as through spatial coverage" would be the intended approach for sample location selection. The SI Work Plan includes conceptual site model (CSM) discussions, but does not include the rationale for the proposed biased sample locations. The SI Work Plan needs to tie the sample locations to the bias and the CSM. Of additional interest would be the inclusion of topographic maps to allow for an assessment of the most probable release pathways. Please revise the SI Work Plan to address these issues.
2. The draft SI Work Plan contains data from previous investigations. However, there are a number of issues with the data presented:
 - A significant amount of the data from previous investigations referenced in the SI Work Plan is missing. The historical data is located in Appendix C, Historical Analytical Data. In addition, references in the body of the SI Work Plan are incorrect. Specific examples are as follows:
 - ▶ Area of Concern (AOC) 2 - The top of Page 2-5 states "the analytical data from this report are included in Tables 4-13 through 4-20 in Appendix C." This data was not found in Appendix C, no data was located for AOC 2.

In addition, the tables in Appendix C are labeled Table C-1, C-2, etc.

- ▶ AOC 6 - The first sentence on Page 2-9 states “the analytical data from this report are included in Attachment 2 in Appendix C.” The analytical data for AOC 6 was located in Appendix C, however, there are no Attachments to Appendix C, the data is found in Tables C-5, C-6 and C-7 in Appendix C.
- ▶ AOC 8 – The last paragraph on Page 2-10 states “the analytical data from this report are included in Table 4-4 in Appendix C.” This data was not found in Appendix C, no data was located for AOC 8. In addition, the tables in Appendix C are labeled Table C-1, C-2, etc.

It is not possible to draw conclusions regarding the validity of the sample location rationale without reviewing the data being referenced to substantiate the rationale. Revise the SI Work Plan to correctly reference the data in Appendix C and ensure all the historical data is included in Appendix C.

- The approach to presenting the historical data is inconsistent and often lacking in the SI Work Plan.
 - ▶ Section 2.2.2, Previous Investigations at AOC 1 discusses on Page 2-3 that a historical sediment sample for manganese was elevated “above the background sample concentration.” Page 2-4 states “low estimated levels below reporting limits of ethylbenzene and xylenes were also detected in sediment.”
 - ▶ Section 2.3.2, Previous Actions and Investigations at AOC 2 discusses on Page 2-5 that for soil “concentrations of chromium and lead exceeded ecological screening criteria and background concentrations.” When discussing the test pits on Page 2-6 it is stated “an organic concentration exceeded the USEPA Region III residential soil RBC.”

Throughout the SI Work Plan references are made to background sample concentrations, “reporting limits,” and human health and ecological screening criteria (i.e., EPA Region 3 Risk Based Concentrations (RBCs)). However, the risk based numbers and background concentrations are not included on the tables in Appendix C or fully presented elsewhere in the SI Work Plan. Without this information, the detection levels cannot be compared to the different screening levels, and it cannot be ensured that based on the data, the information presented in the SI Work Plan is accurate. Additionally, it would be prudent to compare the historical sampling data to the most current RBC values.

Please address the issues discussed above in the revised SI Work Plan.

3. Page 32 of the SI Guidance states that the project management section of an SI work plan/sampling plan should include a description of community relations plans and meetings and information on the SI costs. This information was not found in the SI Work Plan. Please include this information in the revised SI Work Plan.
4. The SI Work Plan includes discussions of the use of upper tolerance limits (UTLs) on Page 1-2, middle paragraph; Page 3-1 (under the bulleted listing); and in the last paragraph on Page 3-13; however, the SI Work Plan does not include the UTL values discussed. Please revise the SI Work Plan to provide the UTL values used for data assessment and include documentation that stakeholder approval for these values has been attained.
5. Page 2-1 of the SI Work Plan discusses that the CAX is a recreation area, as follows: “the mission of CAX includes recreational opportunities to military and civilian personnel, with outdoor recreational facilities including cabins, camp sites, an 18-hole golf course, swimming pool, ball fields, freshwater and saltwater fishing areas, boating, wildlife watching, and hunting.” However, the potential receptors listed for each AOC throughout the SI Work Plan are industrial workers and terrestrial and aquatic ecological receptors (and base personnel for AOC 6). The current approach in the SI Work Plan is ambiguous. A clear approach to risk and data screening should be established within the SI Work Plan. Revise the SI Work Plan to clearly indicate the screening criteria for the data which will depend on the receptor populations at risk or likely to be exposed.
6. Section 3.2.1, General Sampling Approach, discusses the general sampling methods for the Site Investigation. Page 3-3 states “Sediment sample collection will be conducted in accordance with the SOP, Sediment Sampling, included in the UFP-QAPP (Appendix B). At each proposed sediment sample location, samples will be collected from 0 to 4 inches bgs and 4 to 8 inches bgs using a stainless steel trowel.” It is unclear how the proposed sampling approach will collect a representative sample (e.g., without a significant loss of fines and ensure multi-depth sample integrity). Please revise the SI Work Plan to provide additional detail on the proposed sampling approach which elaborates on how a representative sample will be collected via the proposed approach.
7. Section 3.2.1, for those AOCs where the PCOCs include explosives, EPA recommends a multi-incremental sampling approach for soils, used in combination with EPA Method SW846 8330B. This method is proven to be more effective in capturing explosives contamination in soils in comparison to discrete sampling techniques.
8. The Quality Assurance Project Plan (QAPP) worksheets included in Appendix B often reference standard operating procedures (SOPs) for acceptance limit criteria. However, the QAPP should provide summary tables of this information. Please revise the QAPP (Appendix B) to include all acceptance limit criteria in the appropriate worksheet tables.
9. Several analytes in QAPP Worksheets #15-1 through #15-27 list “NC” for the project action limit (AL) and the QAPP does not specify how these compounds will be evaluated. Further, the contract required quantitation limits (CRQLs) are greater than the ALs for many

compounds. It is unclear how these analytes will be assessed. Please revise the QAPP to explain how these compounds will be evaluated.

10. The QAPP included as Appendix B does not provide all of the required forms. For example, generic laboratory audit information is provided in the QAPP. However, examples of laboratory audit checklists are not provided. Revise the QAPP to include copies of laboratory audit checklists, data validation forms, sample labels, chain of custody forms, custody seals, and data reporting forms.
11. The QAPP included as Appendix B references Method SW846 8330. However, Method SW846 8330B was issued in October 2006. This method should be used for applicable explosives analyses. Revise the QAPP to indicate that Method SW846 8330B will be used.

SPECIFIC COMMENTS

12. **Page 1-2:** According to the second paragraph, the qualitative risk evaluation "would involve screening the data against appropriate screening criteria, and if the data exceeds the criteria, a risk-ratio calculation would be conducted. If the qualitative risk evaluation indicates a potential risk, further remedial investigation with quantitative risk assessments and/or removal actions warrant consideration." Please provide more detail in the SI Work Plan regarding "appropriate screening criteria." Similarly, unacceptable "potential risk" should be defined.
13. **Section 2.6.2, Previous Investigations at AOC 8, Page 2-10:** The first paragraph in this section states "the locations of these test pits and sediment sample (7-SD01) are shown in Figure 2-12." Figure 2-12, AOC 8, shows the approximate boundaries of AOC 8. No figure was located in the SI Work Plan depicting the locations of the test pits and sediment sample. Please include this figure in the revised SI Work Plan and correct the reference to it in Section 2.6.2.
14. **Section 3.2.1, General Sampling Approach, Page 3-1:** The discussion on Mobilization/Demobilization in this section states that all field team members are required to review the appropriate master documents prior to conducting field activities. The discussion specifically included a requirement to review the Master Quality Assurance Project Plan [Baker, 2005c], but did not state that review of the Site Inspection QAPP (UFP-QAPP) found in Appendix B was required. According to the Uniform Federal Policy for Quality Assurance Project Plans, EPA-505-B-04-900A, dated March 2005 (UFP-QAPP Manual) and the 'Introduction' of the UFP-QAPP in Appendix B, the UFP-QAPP worksheets are intended to serve as guidelines for the field work and data quality. Since pertinent field sampling and analytical requirements for sample collection, preservation and holding times are not comprehensively listed in Section 3.0 of the SI Work Plan, it appears appropriate to also include a requirement for sampling field team members to review the UFP-QAPP in Appendix B. In accordance with UFP-QAPP guidance, please revise this discussion to include a requirement for field team members to review the UFP-QAPP provided in Appendix B.

15. **Section 3.2.1, General Sampling Approach, Page 3-4:** The table of required quality assurance/quality control (QA/QC) samples and frequency of collection does not appear to match the UFP-QAPP Worksheet #20, Field QC Sample Summary Table (Page 167 of Appendix B). The table of required QA/QC samples in Section 3.2.1 lists the following QA/QC sample collection frequency: 1 field duplicate/10 samples, 1 matrix spike/matrix spike duplicate (MS/MSD)/20 samples, 1 field blanks/source of decontamination water for each sampling event (defined as 1 week) and 1 equipment blank/each day of sampling. However, the UFP-QAPP Worksheet #20 appears to indicate different frequencies. For example, the UFP-QAPP Worksheet #20 lists the total number of soil samples collected for Target Compound List (TCL) volatile organic compounds (VOC) as 62 field soil samples, with the following field QA/QC samples designated: 7 field duplicates, 8 MS/MSDs, 4 field blanks, 4 equipment blanks, and 4 trip blanks. Based on the frequency listed in the Section 3.2.1 table, it appears that collection of 62 field samples would require 4-5 MS/MSDs samples to be collected and a greater number of equipment blanks than field blanks be collected. For consistency and clarity, please revise the QA/QC samples and collection frequency table in Section 3.2.1 to agree with the UFP-QAPP Worksheet #20, or remove the table in Section 3.2.1 and reference the UFP-QAPP worksheets.
16. **Section 3.2.2, Sampling Rationale, AOC 6, Page 3-8:** The third paragraph on Page 3-8 states "Sampling will be conducted in each of the five areas comprising AOC 6 (Penniman AOC) with the exception of the Waste Slag Material. The Waste Slag Material is associated with steam locomotives operations and is not considered a CERCLA release. As such, this area does not warrant further consideration under CERCLA." EPA cannot concur with this statement, as the Waste Slag Pile is a Source Area for the HRS score used to place Cheatham Annex on the NPL. Since the current SI Work Plan does not include any sampling for the Waste Slag Pile, EPA recommends removing all reference to this site in the document. The notion of whether this site is a "CERCLA" site or not should be dealt with separately from this Work Plan, most appropriately at the Tier II/III level. The overarching issue with the Waste Slag Pile is how to delist the Source Area from the NPL without any supporting data other than that obtained for use in the HRS scoring process. Obviously, there was enough data to include it as a Source Area on the NPL. Please remove reference to the Waste Slag Pile from the SI Work Plan if no sampling of the site is proposed.
17. **Page 3-8:** The draft SI Work Plan states that if certain explosives are identified in soil at concentrations below 10 percent, then DPT gw samples will be collected. Please explain why gw samples would not be collected if soil levels are greater than 10 percent. (This comment also applies to page 3-9, TNT Catch Box Ruins.)
18. **Section 3.2.2, Sampling Rationale, AOC 6, Page 3-9:** The second paragraph on Page 3-9, TNT Catch Box Ruins section, states "for a total of 10 soil samples (five surface and five subsurface soil) and three groundwater samples (Figure 3-4)." The second to last paragraph on Page 3-8, TNT Graining House Sump section, states "for a maximum total of four soil samples (two surface and two subsurface soil) and one groundwater sample (Figure 3-3)." Looking at Figure 3-3, Proposed SI Sample Locations, AOC 6, Ammonia Settling Pits and TNT Catch Box Ruins, a total of 10 soil samples and 3 groundwater samples are planned for the Catch Box Ruins and TNT Graining House area. If 4 soil samples and 1 groundwater

sample are considered within the TNT Graining House subarea, that leaves 6 soil samples and 2 groundwater samples at the TNT Catch Box Ruins subarea. It is not clear why the samples for the TNT Catch Box Ruins area are presented with the total samples for the combined area and the TNT Graining House Sump section presents only the samples for this subarea. This apparent inconsistency should be addressed in the revised SI Work Plan. Additionally, the use of a multi-incremental sampling approach will alter the sampling scheme for soils where explosives are considered to be PCOCs.

19. **Table 3-6, Summary of Screening Values:** Table 3-6 list the screening criteria to be used for screening detected results to determine if a release has occurred that may pose an unacceptable risk. This table does not contain any references. Revise Table 3-6 of the SI Work Plan to include references. Ensure that references/footnotes are also included explaining and providing a reference for the adjustments noted in this table.
20. **Figure 3-6, Proposed SI Sample Locations, AOC 8:** Figure 3-6 contains an area outlined in green. The significance of the green line is not contained in the legend of the figure. Revise the figure to include the green line and its significance in the figure legend.
21. **Appendix B, QAPP Worksheet #7, Personnel Responsibilities and Qualification Table, Page 30:** According to the UFP-QAPP Manual, QAPP Worksheet #7, Personnel Responsibilities and Qualification Table should list the responsibilities for all project personnel associated with each organization, contractor, and subcontractor. The QAPP Worksheet #7 of Appendix B does not provide personnel qualifications for the Quality Assurance (QA) officers for the laboratories, Katahdin Analytical Services (Leslie Dimond) and GPL Laboratories (Elsa Tai). In accordance with the UFP-QAPP Manual, please revise QAPP Worksheet #7 to include personnel qualifications for the laboratory QA Officer positions.
22. **Appendix B, QAPP Worksheet #12-4 and #12-5, Measurement Performance Criteria Table, Pages 41 and 42:** It appears that the measurement performance criteria for the target analyte list (TAL) metals/cyanide by ICP-AES (ILM05.3) as provided in QAPP Worksheet #12-4 has been duplicated in QAPP Worksheet #12-5. Please revise Appendix B to remove the duplicate Worksheet #12-5. Also, please ensure the appropriate measurement performance criteria are presented in Worksheet #12-4 since Worksheet #12-5 provides slightly different criteria.
23. **Appendix B, QAPP Worksheet #15, Reference Limits and Evaluation Table, Pages 79 to 151:** The CRQLs provided for several analytes in the tables provided for Worksheet #15 were above the ALs. However, these particular analytes were not always shaded in pink when the CRQLs exceeded the ALs. For example, Page 91 of Appendix B lists the AL for naphthalene at 0.176 mg/kg and the CRQL at 0.330 mg/kg, but this line is not shaded in pink. Please revise all tables in Worksheet #15 to shade all compounds where the CRQL exceeds the AL.
24. **Appendix B, QAPP Worksheet #19, Analytical SOP Requirements Table, Page 165:** This table indicates that the preservation requirement for temperature is less than or equal to

6 degrees Celsius (°C). However, the standard requirement is 4 plus/minus (\pm) 2°C. Also, the table indicates that the container required for TCL VOCs is a soil jar. However, the jar should have a Teflon-lined cap. Please revise Appendix B to clarify these discrepancies and ensure all analytical requirements are accurately presented in the table.

25. **Appendix B, QAPP Worksheet #25, Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table, Page 179:** The table references the SOP for acceptance criteria and corrective action. However, specific references should be provided (i.e., section and/or page number). Please revise the QAPP to provide more specific references.
26. **Appendix B, QAPP Worksheet #29, Project Documents and Records Table, Page 215:** The table indicates that instrument printouts will be included in the off-site analysis documents and records. It is recommended that the analytical records include additional detail should manual integration be required. This information should include the chromatograms before and after each manual integration as well as the reason for each manual integration. Please revise Appendix B to indicate that this information will be included in the analytical records.

This concludes EPA's review of the Navy's February, 2008 draft *Work Plan for Site Investigation – Various Areas of Concern* for the investigation of AOCs 1, 2, 6, 7, and 8 located at the CAX NPL sit. If you have any questions, please feel free to call me at (215) 814-3357,

Sincerely,



Robert Thomson, P.E., R.E.M.
Federal Facility Remediation (3HS11)

Cc: Wade Smith (VaDEQ, Richmond)
Dawn Ioven (USEPA, 3HS41)