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November 5, 2013

Mr. Moshood Oduwole
Federal Facility Remediation (3HS11)
USEPA Region 3
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Subject: Response to Comments - *Draft Sampling and Analysis Plan for Site 6 Data Gap Investigation, Naval Weapons Station Yorktown, Yorktown, Virginia*

Dear Mr. Oduwole,

This letter is in response to comments provided in your letter dated October 23, 2013 for the subject document. The USEPA comments are shown followed by the Navy responses in italics.

1. **Comment:** Page 42, first bullet: The text indicates the soil samples in the excavated area will only be analyzed for cadmium and zinc, the COCs. It is not clear that analyses should be so limited. Due to the high variability that can exist in soil sample concentrations, it would be important to analyze for the full suite of contaminants to ensure the COC list that was first generated is accurate. This would hold true for all analyses.

   ***Response**: This comment refers to Worksheet #9-4 (Project Scoping Session). The previous site investigations and decision documents are discussed in Worksheet #10 (Conceptual Site Model) and provide the basis for COCs selected at Site 6. A sentence will be added to Worksheet #9-4 to reference the historic site investigations and decisions included in Worksheet #10. Historic soil samples that were collected at the Excavated Area during the Round II RI were analyzed for a full suite of parameters. Using this data, human health and ecological risk assessments were conducted and zinc and cadmium were the only constituents identified as potentially posing unacceptable risks in soil at the Excavated Area. Based on these assessments, a ROD was signed by the Navy and the USEPA Region 3, with concurrence from the VDEQ, in 1998. The ROD identified cadmium and zinc as the only COCs in this area and selected a soil cover as the remedy. Therefore, although there is some uncertainty regarding the horizontal extent of soil contamination at the Excavated Area, the areas with the highest concentrations are considered to have been investigated and the risk assessments are considered complete. Therefore, restricting the analytical parameter list to COCs only in the Excavated Area is considered appropriate.*

2. **Comment:** Page 42, third bullet: The text refers to former building 109 and the soil sampling that will be beneath and around the building footprint. According to Figure 17, there are four samples beneath the footprint of the building (6SO13-14 and 6SO16-17). All four of these samples are located in the drain trench. It is unclear if other portions beneath the building footprint also need to be sampled. All the soil samples around the building footprint appear to be located at doors. Each loading dock door needs to have a sample. This means adding one more sample. Also, please provide justification that the distance the sample is located to the door (approximately up to six feet) is appropriate.

   ***Response**: The third bullet in Worksheet #9-4 (Project Scoping Session) will be modified to clarify that based on engineering drawings and historical photographs, other portions beneath the building footprint do not need to be sampled. During the SAP development, the Building 109 engineering drawings and historical photographs were evaluated to identify the locations most likely to be impacted if there was a historic release at the building. It was concluded that the drain trenches that ran through the building would be the most likely location for contamination to persist for the following reasons. First, the trenches were the conduit for explosive reclamation wastewater to the concrete flumes. Wastewater from the building was concluded to be the primary source of contamination to the Site 6 Flume Area and the Impoundment Area. Second, the trenches were used to remove large particles of explosive as part of the building activities. Third, although Building 109 also included a cooling rack, steam-out tank, kettles, and offices, the building floor appears to have been solid concrete and any spills inside the building would have been directed towards the drainage trenches. Accordingly, four soil sample locations were proposed along the trenches inside the building footprint and two soil sample locations were proposed at the outside drainage trenches. Outside of the building footprint, doors, a loading dock, an outside wash rack, and a wet scrubber were identified as potential locations for a release to soil. The Site Description subsection in Worksheet #10 (Conceptual Site Model) will be modified to add additional information about Building 109 to help clarify why the trenches are the most likely location to identify potential contamination beneath the building footprint.*

   As requested, another soil sample location (adjacent to 6SO26) will be added to the investigation so that there is a sample adjacent to each historic door location. It is assumed that if a release occurred at the one of these locations, then it would have impacted soil immediate adjacent to the door. Therefore, all soil samples that are located next to historic door locations will be moved within 1 foot of the indentified doors.

3. **Comment:** Page 43: The text identifies an oil water treatment unit that covered an area of approximately 15 by 20 feet and concluded a single sample was sufficient for evaluation. Because no information is provided regarding spills from this unit and the high variability that can exist in soil chemical concentrations, a single sample may not be sufficient for this

evaluation. Four samples, one on each side, may be more appropriate for an adequate evaluation.

***Response**: The text in Worksheet #9-4 (Project Scoping Session) will be modified to state that there is no record or evidence (such as, staining) of a release to the environment. Based on aerial photographs, the oil/water treatment unit (OWTU) appears to have been located aboveground and enclosed. In order to see the former OWTU unit better, the gray fill for the OWTU symbol will be removed from Figure 17. For these reasons, only one soil sample was considered necessary to identify if this was a potential point of release at Site 6. As stated in Table 1 of Worksheet #11, if soil concentrations indicate that a release did occur, then soil in the Building 109 area may be considered for additional investigation or remediation. However, if there is no indication of a release, then no additional action will be warranted. A sentence will be added to Worksheet #9-4 to further clarify that the soil sample adjacent to the OWTU will be collected with the objective of identifying a potential release only. The proposed soil boring was located outside of the OWTU footprint because it is assumed that if a release did occur, it would have overflowed onto the surrounding ground surface. The proposed sample was placed to the north of the OWTU for a few reasons: 1) Since the topography slopes in this direction, runoff would be more likely to impact this area and 2) because this location can also be used to evaluate potential overflow from the former concrete flume, consistent with the scoping session discussion in Worksheet #9-4. These details will be added to Worksheet #10 (Conceptual Site Model).*

4. **Comment:** Page 44, bullet 3: The text indicates that eight surface water and sediment samples would be collected. However, none of the samples are located near the point where the flumes discharge. At least one more sample needs to be added at this discharge location.

***Response**: This comment refers to Worksheet #9-4 (Project Scoping Session). Proposed sediment and surface water samples 6SD95/6SW95 will be moved closer to the flume discharge location, as requested; Figure 18 will be updated accordingly. Nevertheless, as discussed in Worksheet #10 (Conceptual Site Model), contaminated sediment from this flume discharge area was excavated and treated as part of the remedial actions conducted between 1998 and 2006. During this remedial effort, contaminated soil and sediment were also removed from the Flume Area and the Building 109 concrete flumes were decontaminated as specified in the ROD. Therefore, no additional discharge of contaminants to sediment in this area is considered to have occurred since operations had seized prior to the removal actions. The other three sediment samples proposed within the removal footprint (shown as a bright green outline on the figures) will still be located within the center of the Impoundment Area to help evaluate the groundwater to surface water/sediment pathway, along with evaluating the effectiveness of the previous remedial action.*

5. **Comment:** Appendix B Ecological Screening Values: The soil screening value for each of the seven Aroclors listed is 8,000 µg/kg. Support must be provided for using one fifth (1/5) of a LC50 (40,000 µg/kg) to generate a chronic screening value, particularly given the toxicology of these compounds. More appropriate screening values are available. Also, the ecological screening value for chromium should be the EcoSSL of 26 mg/kg (CrIII) and not 64 mg/kg as indicated in Table B-1 for soils.

Response: *The PCB value listed in Table B-1 is not based on a LC50 but on a chronic EC50 (growth); the value of 40,000 µg/kg is the lowest of the reported EC50 (chronic LOEC) values. An uncertainty factor of 5 was used to convert this value to a chronic NOEC (8,000 µg/kg). The actual NOEC from the referenced study (Efroymson et al. 1997a) was actually higher (20,000 µg/kg). The tables notes will be modified to include the acronyms used in the table to help clarify the ESV's basis.*

The referenced Eco SSL value of 26 mg/kg for chromium is based on food web exposures for avian receptors. To avoid potential confusion during the screening process and simplify the PAL list, the ESVs provided in Table B-1 of the SAP are for lower trophic level receptors (soil invertebrates and plants). However, bird and mammal Eco SSLs will also be considered during the food web exposure evaluation in any ecological risk assessment. A note will be added to the bottom of Table B-1 to clarify this. The requested project QL goal for chromium in soil on Worksheet #15-21 is below 0.5 mg/kg in order to meet the human health adjusted residential RSLs. Therefore, the reporting limits for chromium in soil should achieve the requirements for any ecological risk assessment.

6. **Comment:** Page 52, second bullet: Two sediment samples need to be located in each of the two drainages north of the Impoundment Area.

Response*: A second sediment sample will be proposed for the northeastern drainage, as requested. There are already 2 sediment samples (6SD87 and 6SD88) proposed for collection in the northwestern drainage. The sediment samples locations along both drainages will be slightly modified on Figure 18 for more even spacing between the samples.*

7. **Comment:** Page 52, Contaminant Fate and Transport: The text states "Contaminated sediment still exists in the remainder of the Impoundment Area and may exist at drainages and concrete flumes identified as potential release areas." It is unclear from the text or Figure 18 that the areas of contaminated sediment that still exist are included in the proposed sample locations. Including another enlarged figure of the Impoundment Area showing the existing areas of contamination and the proposed sample locations is needed to determine where additional samples may be needed.

Response*: The referenced sentence will be revised as follows, "Outside of the removal footprint area, LTM was the selected remedy documented in the ROD for sediment and surface water in the Impoundment Area, in order to prevent destruction of the wetland habitat. Although attenuation of contaminants has likely occurred, contaminated sediment most likely still exists within this portion of the Impoundment Area. Contaminated sediment*

may also exist at drainages and the Building 110 concrete flumes identified as potential release areas." As shown on Figure 18, four sediment samples (6SD89, 6SD90, 6SD91, and 6SD93) are proposed within the Impoundment area, but outside of the removal area footprint (shown as a bright green line). Four sediment samples are proposed within the Impoundment Area and inside the removal area. These eight sediment samples are considered sufficient to adequately update the conceptual site model within the Impoundment Area (that is, assess current conditions), in consideration that this area is under LTM since the active component of the remedial action has already been implemented.

8. **Comment:** Page 55, first bullet: The text indicates it is not known if groundwater discharges to surface water and sediment in the Impoundment Area. This information is needed to be able to determine if additional surface water and sediment samples are needed.

***Response**: This bullet identifies one of the data gaps (that is, potential impacts to sediment and surface water in the Impoundment Area from groundwater discharge) in the conceptual site model at Site 6. To address this uncertainty, eight surface water and sediment samples are proposed throughout the Impoundment Area. Additionally, water levels will be measured in site monitoring wells to confirm vertical hydraulic gradients. To address the uncertainty as to whether additional samples are needed, text will be added to the bullet to explain that vertical gradients in groundwater measured during the RI, along with the intermittent nature of surface water, indicate that the interior of the Impoundment area is considered the most likely location for groundwater discharge to occur. Based on water levels measured in site monitoring wells during the RI, downward vertical gradients were observed at the eastern edge of the Impoundment Area (6GW012/6GW012A) and the western edge of the Impoundment Area (6GW04/6GW08/6GW015). Upward vertical gradients were observed in the interior of the Impoundment Area (6GW013/6GW013S) and along the northern edge (6GW006/6GW006B). Surface water within the Impoundment area is intermittent and surface water levels fluctuate with tides and seasonal precipitation; therefore, surface water does not always extend to the edge of the Impoundment Area. Of note, the proposed sediment and surface water samples include two locations (6SD91 and 6SD94) which are near monitoring wells with some of the highest concentrations in groundwater (6GW013 and 6GW015).*

9. **Comment:** Page 57: Figure 17 shows the Excavation Area is upgradient of one of the drainages on the north side of the Impoundment Area. However, there is only one soil sample proposed between the Excavation Area and this drainage. Two soil samples need to be located between these two features.

***Response**: Only one sample is considered sufficient to refine the extent of contamination south of the Excavated Area. As shown on the Appendix D figure, the sample located closest to the drainage (southeast corner of the Excavated Area) had much lower concentrations than soil samples located in the center and northwest corner of the Excavated Area.*

Therefore, concentrations appear to decrease in the direction of the drainages. Furthermore, zinc was the only constituent detected in this southeastern sample with concentrations exceeding remedial goals. Since zinc typically sorbs to iron hydroxides and manganese oxides in soil, it is not considered particularly soluble and therefore, less likely to migrate with surface water runoff towards the drainages. The proposed soil sample (6SO10) is only 100 feet from the northwestern drainage, which is considered an acceptable distance to evaluate if storage activities at the Excavated Area may have impacted this drainage. Zinc and cadmium concentrations at 6SO10 will be compared to concentrations in the two sediment samples, which will be collected from the northwest drainage, to assist in the evaluation.

10. **Comment:** Page 61, second bullet: Groundwater needs to be screened against BTAG surface water screening values.

***Response**: Felgates Creek is considered the ultimate receiving surface water body for any groundwater discharge at Site 6. To assess potential risks to ecological receptors from groundwater discharge to the creek, surface water, sediment, and sediment pore water samples were collected during the Phase II RI (2009) and directly evaluated in an ecological risk assessment. The risk assessment concluded that there were no unacceptable risks. Although there may be unacceptable risks from exposure to surface water in the Impoundment Area, surface water samples will be collected from this area during the data gap investigation and directly evaluated against ecological surface water screening values. Therefore, screening groundwater analytical data from this data gap investigation only against human health PALs is considered appropriate. This will also meet the primary goal of the groundwater investigation, which is to complete a feasibility study. Therefore, no changes will be made to the SAP text.*

11. **Comment:** Page 62: The text indicates if data indicate a significant increase (one order of magnitude or higher) in concentrations of constituents the risk assessments from the Round Two RI may be revised. Please explain why the one order of magnitude or higher criteria is appropriate. For the ecological risk assessment, the appropriate methodology would be to compare the actual sample concentrations to the appropriate ecological screening criteria to show if the potential for ecological risk exists.

***Response:** The referenced text only applies to media and areas at Site 6 for which human health and/or ecological risk assessments have been completed and accepted. This includes soil at the Excavated Area, sediment and surface water at the Impoundment Area, and groundwater. The results of the risk assessments concluded that there were potentially unacceptable risks in all of these areas/media. Since the selected remedial actions for soil in the Excavated Area (soil cover) and sediment and surface water in the Impoundment Area (LTM) did not include complete removal and/or actively treat the contaminated media, COC concentrations in data gap investigation samples from these areas will likely still exceed screening criteria. Similarly, since a groundwater remedy has not yet been selected and implemented at the site, groundwater concentrations will likely still be elevated. However, it is assumed that unless there is a significant change in concentrations from those found in the previous investigations, the previous risk assessment results would still be applicable to the*

site. In other words, it would be concluded that there are still potentially unacceptable risks at Site 6 from exposure to these media and the selected remedial actions will continue to be implemented and/or developed. One order of magnitude change in concentration was proposed in the SAP since that is the anticipated level of concentration change needed to potentially impact the results of the previous risk assessments, in a manner that might warrant new risk evaluations. Data gap investigation samples collected from areas that have not previously undergone risk assessment will be evaluated against the appropriate PALs.

12. **Comment:** Page 65, second bullet: The text indicates that waste in the cleared area will be determined by visual observation. The text also needs to indicate if contamination can be present when visual waste is not observed. This is critical because the text goes on to indicate that soil sampling of the cleared area is dependent on the presence of waste.

***Response**: The text will be revised to clarify that if waste is not observed at the cleared area, then it is assumed that there is no contamination in this area. There is no evidence to suggest that a release occurred at the cleared area or industrial activities, which might cause a release, were conducted at the cleared area. It is not the Navy's protocol to collect samples for analysis in areas that have no indications of a release based on site history and site visits. Nevertheless, since the cleared area was identified while trying to resolve the location of the Excavated Area, test pitting will be conducted to confirm that burial activities were not conducted at this location. Since there is no evidence of burial activities at this site, then waste is not expected to be encountered in any of the test pits. However, in order to remain flexible for any potential site conditions, the SAP includes subsurface soil sampling in the unlikely situation that waste is encountered.*

13. **Comment:** Page 79: The reference to Figure 18 needs to change to Figure 17. Please confirm that all figure number references are correct. According to Figure 17 (Proposed Test Pit, Soil, and Groundwater Sample Locations) there are symbols for test pit sample and proposed test pit and soil sample location. Please explain how these are different.

***Response**: The figure reference on page 79 will be changed to Figure 17. The remainder of figure numbers in the SAP will be verified that they are correct. The "Test Pit" samples refer to those locations where only test pitting is anticipated (that is, the cleared area). These symbols will be re-designated as "Proposed Test Pit" samples in the legend for consistency with the other proposed samples. As previously stated, it is considered very unlikely that any waste will be encountered in the test pits. However, the SAP has been written for flexibility to allow for soil sampling in the unlikely case that waste is observed. The "Proposed Test Pit and Soil Sample Location" samples refer to those locations where soil samples are proposed even if waste is not encountered. At the Excavated Area, soil samples will be collected in conjunction with the test pit locations to help evaluate the presence of a soil cover and facilitate the remedial decision making for this operable unit.*

14. **Comment:** Page 79: Worksheet 14 indicates if buried debris is encountered in the Excavated Area or the cleared area and the waste exhibits signs of gross contamination, then a deep subsurface soil sample and waste sample will be collected for laboratory analysis. If the waste does not exhibit signs of gross contamination, then no deep subsurface samples will be collected. It is unclear what is meant by "gross contamination" and how this level of contamination would be determined. Because not all contamination of concern would necessarily be described as visibly gross contamination, BTAG recommends deep subsurface soil samples be collected from these two areas if buried debris is present. Also, explain why contamination that is not visibly apparent (i.e., not gross contamination) could not also produce risk to ecological receptors.

***Response**: The text in Worksheet #14 will be revised to state that subsurface soil samples will be collected if waste is encountered. The decision logic requiring the presence of gross contamination prior to soil sampling will be removed.*

15. **Comment:** Page 81: Worksheet 14 discusses the collection of surface soil samples. According to Figure 17, test pits only are proposed for the cleared area. No surface soil samples are proposed for this area. Additional background on this area needs to be provided to justify not collecting surface soil samples. If sufficient historical information is not available, surface soil samples need to be collected from the cleared area.

***Response**: See response to Comment #12. The text in Worksheet #14 will be revised to reiterate that soil samples are not proposed in the cleared area since there is no evidence that a release occurred in this area.*

16. **Comment:** Page 84: This section is clearly labeled Surface Water and Sediment Sampling. However, the text states "Figure 19 shows the proposed soil sample locations." First, there is no Figure 19 and it needs to change to Figure 18. Second, it is not clear why soil sample locations are being mentioned in this section on surface water and sediment.

Response**: Concur. The sentence will be revised to state, "Figure 18*** shows the proposed surface water and sediment sample locations."

17. **Comment:** Page 84: Worksheet 14 indicates that it is anticipated that both surface water and sediment will be collected during the data gap investigation and that an effort will be made to avoid sampling during a dry season or month. It is critical that sampling occur between late fall to early spring as this is when water is flowing in seeps and intermittent streams. Sampling outside of this time period would likely result in a data gap in this investigation. Worksheet #16 on page 127 indicates field work is scheduled to take place during November. This may be too early for this year since rainfall in the area has been low. In addition, the lower portion of the impoundment area is tidal and surface water in tidal

areas needs to be collected on the outgoing tide as close as possible to low tide to minimize dilution and capture worst case concentrations.

***Response**: Concur. The text in the SAP will be revised to state that surface water and sediment sampling should be preferentially collected between late fall and early spring and that tidal cycles should be considered, with preference to outgoing tide. The schedule included in Worksheet #16 will need to be revised following acceptance of the Yorktown Partnering Team's comments. Based on the current status of the SAP, sampling is most likely to occur in early spring of 2014.*

18. **Comment:** Page 84: Worksheet 14 indicates if measured salinity is less than 10 parts per trillion, then a surface water sample will be collected for hardness. The units for salinity are incorrectly identified as parts per trillion. The correct units are parts per thousand. This unit also needs to be corrected in the Abbreviations an Acronyms Section on page 15.

***Response**: Noted. The units will be revised in the text of Worksheet #14 and in the Acronyms section.*

Please provide acceptance of these responses. Any back comments are requested by November 19, 2013. Should you have any additional questions, please feel free to contact me.

Sincerely,

CH2M HILL

William J. Friedmann Jr.

William J. Friedmann, Jr.
Activity Manager

cc: Mr. Wade Smith/VDEQ
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