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March 23, 2007

U.S. Environmental Protection Agency - Region II
290 Broadway – 22nd Floor
New York, New York 10007-1866

Attn: Mr. Adolph Everett, P.E.
Chief, RCRA Programs Branch

Re: Contract N62470-02-D-3052
Navy CLEAN, District III
Contract Task Order (CTO) 110
U.S. Naval Activity Puerto Rico (NAPR)
Final Phase I RCRA Facility Investigation Report for SWMU 14
Naval Activity Puerto Rico
RCRA/HSWA Permit No. PR2170027203

Dear Mr. Everett:

Baker Environmental, Inc. (Baker), on behalf of the Navy, is pleased to provide you with two copies of the replacement cover and spine, inside cover, text, tables, figures, and appendices for the Draft Phase I RCRA Facility Investigation Report for SWMU 14 dated December 18, 2006. These replacement pages make up the Final Phase I RCRA Facility Investigation Report for SWMU 14. Directions for inserting the replacement pages into the Draft Phase I RCRA Facility Investigation Report for SWMU 14 are provided for your use. Also included with the two copies of the replacement pages are two electronic copies provided on CD of the Final Phase I RCRA Facility Investigation Report for SWMU 14, Naval Activity Puerto Rico.

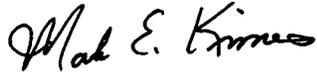
This document is submitted in accordance with the EPA letter dated February 13, 2007. The Navy responses to your comments dated February 13, 2007 are also attached.

Mr. Adolph Everett, P.E.
U.S. Environmental Protection Agency, Region II
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If you have questions regarding this submittal, please contact Mr. Mark E. Davidson at (843) 743-2135. Additional distribution has been made as indicated below.

Sincerely,

BAKER ENVIRONMENTAL, INC.



Mark E. Kimes, P.E.
Activity Manager

MEK/lp
Attachments

cc: Ms. Jean Mann, NAVFAC Atlantic – Code AQ119 (letter only)
Mr. David Criswell, BRAC Program Management Office SE (letter only)
Mr. Jeffery G. Meyers, Navy BRAC PMO SE (letter only)
Mr. Mark Davidson, Navy BRAC PMO SE (1 hard copy and 1 CD)
Ms. Bonnie Capito, LANTDIV Code EV32 (1 hard copy for Admin Record)
Mr. Pedro Ruiz, NAPR (1 hard copy and 1 CD)
Mr. Tim Gordon, US EPA Region II (2 hard copies and 2 CDs)
Mr. Matt Lary, TechLaw (1 CD)
Mr. Carl Soderberg, US EPA Caribbean Office (1 CD)
Mr. Manny Vargas, PR EQB (1 hard copy and 1 CD)
Ms. Yarissa Martinez, PR EQB (1 hard copy and 1 CD)
Mr. Felix Lopez, U.S. F&WS (1 CD)
Ms. Jamie Butler, CH2M Hill Virginia Beach (1 CD)

**NAVY RESPONSE TO EPA COMMENTS
DATED FEBRUARY 13, 2007 ON THE
DRAFT RCRA FACILITY INVESTIGATION REPORT
SWMU 14
DECEMBER 18, 2006
NAVAL ACTIVITY PUERTO RICO
CEIBA, PUERTO RICO**

EPA REGION II COMMENTS

Based upon our review and a review by EPA Region 2's contractor, Booz Allen Hamilton (Booz Allen), EPA has determined that the December 18, 2006 Draft RFI Report for SWMU 14 is not fully acceptable. Several items in the Draft Report that are not fully acceptable and need revision are discussed in the enclosed Technical Review. Within 35 days of your receipt of this letter, please submit an addendum to the work plan or a revised work plan, which addresses all comments given above and in the enclosed technical review.

Navy Response: Please see the responses to Booz Allen comments below. The RFI report has been revised as discussed in the responses below.

BOOZ ALLEN COMMENTS

I. GENERAL COMMENTS

1. Although Section 6.3.1 indicates that inhalation of volatile emissions emanating from groundwater will be evaluated as an exposure pathway for the future young child resident receptor in the human health risk assessment (HHRA), and appropriate exposure parameters are outlined in Table 6-4, these calculations were not performed for the young child resident receptor. NAPR should perform these calculations and insert a summary of the results into the revised HHRA, as appropriate. Alternatively, NAPR should discuss why quantitative evaluation of this pathway was not necessary, and remove references to it from other sections, as appropriate.

Navy Response: The inclusion of future residential children in the discussion of evaluation of inhalation of volatile emissions emanating from groundwater was an oversight. The HHRA will be revised to omit all references to this evaluation. Discussion will be incorporated into Section 6.3.1 stating that inhalation of volatiles in groundwater was evaluated only for the future residential adult. Young children are not expected to shower and therefore, are not evaluated for exposure to inhalation of VOCs in groundwater. Rather, young children are evaluated for dermal contact exposure to groundwater while bathing.

2. While it is understood that no buildings are currently located within SWMU 14, the HHRA states that, "in the future scenario, although land use is uncertain, it is assumed that residential development of the site could occur" (page 6-7). Appendix H, Table 1,

Selection of Exposure Pathways, indicates that the vapor migration to indoor air exposure pathway is discussed qualitatively for the adult resident and construction worker receptors; however, relevant discussion could not be located in Section 6.3 or elsewhere in the document. Since volatile organic compound (VOC) contamination is present in groundwater (unknown depth interval[s]), it is unclear why NAPR evaluated inhalation of volatile emissions emanating from groundwater (i.e., while showering or bathing) for future residents quantitatively, but did not evaluate risks posed by exposure to indoor air impacted by vapor intrusion, either quantitatively or qualitatively. NAPR should revise the HHRA to include either a qualitative or quantitative discussion of vapor intrusion for future receptors, as appropriate, following EPA's November 2002 *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils*.

Navy Response: While the future land use at SWMU 14 is likely to remain the same in the future, the area surrounding the SWMU could support a building. Currently, there are buildings located northeast of SWMU 14. The HHRA will be revised to include a quantitative evaluation of exposure to indoor air potentially impacted by vapor intrusion (from contaminated groundwater) for future residential receptors.

II. SPECIFIC COMMENTS

Section 4.1, Soil Boring Advancement and Temporary Well Installation, Page 4-1

1. The second paragraph in this section indicates that two temporary wells were installed in the original/current fire training pit area (FTPA) at locations 14SB01 and 14SB02). The third paragraph in this section indicates that a third temporary well was installed at the center of the temporary FTPA. At first glance, the placement of only two temporary wells in the original/current FTPA appears to contradict the scope of work outlined in the approved RFI WP for this SWMU. Section 3.0 of the WP indicated that three temporary wells would be installed at the original/current FTPA (along with another one at the temporary FTPA). However, discrepancies in the final WP (specifically, between Section 3.0, Section 3.2, Table 3-1, and Figure 3-1) call into question the required number of temporary wells. Thus, the implemented scope of RFI work at this SWMU was, presumably, based on NAPR's interpretation of the WP, and not necessarily EPA's interpretation. Nevertheless, despite these inconsistencies, data obtained from the three temporary wells was sufficient to confirm that groundwater contamination is a significant human health risk driver for certain exposure pathways. Thus, it is likely that groundwater will need to be further addressed as part of corrective measures for SWMU 14.

Navy Response: Comment noted. The text in the work plan stated that two wells would be installed in the original pit location and the third well would be installed in the temporary pit location.

Section 4.3.3, Field Blanks, Page 4-3

2. As stated in Section 3.4.3 of the approved RFI WP, NAPR anticipated using and collecting field blanks from three water sources during this investigation (i.e., lab-grade deionized water, NAPR potable water, and store-bought distilled water). According to this section of the RFI Report, only two field blanks were collected (deionized water and NAPR potable water). The RFI Report should be revised to confirm that no distilled water was used during the SWMU 14 field effort, or explain why the associated field blank was not collected as scoped.

Navy Response: Section 4.3.3 has been modified that only two of the field blanks were collected since store bought distilled water was not utilized during the field investigation.

Section 5.3, Subsurface Soils, Page 5-3

3. The last sentence in this section suggests that lead exceeded its NAPR background value in only a few samples and these exceedences, “are likely dataset anomalies rather than an indication of substantial metals contamination”. However, lead concentrations were reported above the established site-specific background level in five of the fourteen subsurface soil samples. Because lead concentrations also exceeded background levels in the surface soil samples, it seems more likely that these results indicate some lead contamination in surface and subsurface soil. Revise the RFI Report to address this issue in greater detail and provide justification for why lead detections were considered to be anomalies rather than indications of actual contamination.

Navy Response: Agree. The text will be revised to indicate that some lead contamination may be present in the subsurface soil due to exceedances of background screening levels. The subsurface soil sample results did not indicate exceedances of the RBC screening criteria.

Section 5.5, 2006 Laboratory Data Validation Summary, Page 5-4

4. As currently written, this section is too general to provide the end-user with an understanding of the limitations placed on specific data and the impact, if any, on attaining project objectives. The data validation summary should be rewritten to describe the usability of the data for specific samples and constituents. Vague statements, such as, “...some compounds were qualified as estimated,” or “Qualifications were added to the data,” should be replaced with more specific statements regarding the usability of the data as indicated by the data validation. The revised section should identify all data that were rejected by media, sample name, and constituent of concern; describe the reason for the rejection; and assess how the rejection affects attainment of project objectives. Specific data that were qualified as estimated also should be identified, the magnitude and direction of bias described, and impact on project objectives evaluated. The focus of the section should be to concisely alert end-users of limitations on the usability of the data, rather than reiterate information regarding specific quality control (QC) failures from the data validation reports.

Navy Response: Summaries have been added to the laboratory data validation summaries provide the detail requested along with revising the text within this section providing the additional detail.

Section 6.2.2.2, Selection of COPCs, Surface Soil, Page 6-4

5. The second paragraph incorrectly notes that 2-butanone has no current screening criteria available; this should be changed to 2-hexanone. Revise the HHRA to correct this error.

Navy Response: The paragraph will be revised to change 2-butanone to 2-hexanone.

Section 6.3.1, Potential Human Receptors, Future On-Site Adult and Child (Ages 1-6 Years) Receptors, Page 6-8

6. The fourth bullet lists “incidental ingestion of groundwater” as an exposure pathway that was evaluated quantitatively for the future residential adult and child receptors in the HHRA. This should be modified to indicate ingestion of groundwater as a potable source, to avoid confusion and ensure consistency with the description of this exposure pathway on page 6-7 and Figure 6-1, Conceptual Site Model.

Navy Response: Section 6.3.1 will be revised to remove the word “incidental” from the bullet list descriptions of soil and groundwater exposure pathways.

Section 6.3.5, Exposure Input Parameters, Page 6-10

7. While the exposure input parameters outlined in this section and listed in Table 6-4 appear appropriate, NAPR does not provide rationale for most values that are based on professional judgment. For example, NAPR points out that using an exposure time (ET) of 24 hours for future residential receptors is conservative. However, all other exposure input parameters that are based on professional judgment require a brief explanation to justify the selection and improve transparency of the HHRA. This section should be revised accordingly.

Navy Response: Section 6.3.5 will be revised to include brief explanations for the exposure parameters that are based on professional judgment.

Section 6.4.3, Dermal Absorption Efficiency, Page 6-15

8. This section provides a detailed discussion of how dermal absorption factors were used to adjust reference doses (RfDs) and cancer slope factors (CSFs). The discussion implies that oral to dermal adjustment factors less than 100% were used in some cases. However, based on the information provided in Table 6-5, the oral to dermal adjustment factors for all chemicals of potential concern (COPC) are listed as 100%. It is unclear why Section 6.4.3 would provide such a detailed justification for using oral to dermal adjustment factors less than 100% if 100% was used for all COPCs. Revise the HHRA to clarify that oral to dermal adjustment factors of 100% were, in fact, used for all COPCs listed in

Table 6-5.

Navy Response: Section 6.4.3 will be revised to state that none of the SWMU 14 COPCs were adjusted and that the information in the section was provided for reader knowledge of the adjustment process.

Section 6.5.3, Potential Human Health Effects, Page 6-17

9. Adult and adolescent trespassers were omitted from the discussion in the first paragraph in this section. This paragraph should be revised to indicate that site risks were estimated for these receptors, even if no unacceptable risks were calculated.

Navy Response: The first paragraph of Section 6.5.3 will be revised to include trespassers in the description of the receptors for which total site risks were estimated.

Section 6.5.3.2, Future Adult and Young Child Residents, Page 6-18

10. The third paragraph of this section states that, “ingestion and inhalation of groundwater COPCs contributed primarily to the groundwater HI [hazard index] (10.6) for the residential child.” This statement is incorrect, however, as risks to the future young child resident due to inhalation of groundwater COPCs were not estimated (see General Comment No. 1). Thus, the groundwater HI can be attributed solely to ingestion and dermal exposures. Depending on the resolution to General Comment No. 1, this statement should be revised or retained as appropriate.

Navy Response: The third paragraph of Section 6.5.3.2 will be revised to state that “Ingestion of groundwater COPCs contributed primarily to the groundwater HI (10.6) for the residential child.”

Section 6.8, HHRA References, Page 6-24

11. The reference date given for the EPA Region 3 Risk-Based Concentration (RBC) Table is April 2006; however, the RBC Table was updated more recently, in October 2006. NAPR should ensure that the most up-to-date RBC values have been used in the HHRA to screen site COPCs, and update this reference in the revised HHRA.

Navy Response: The HHRA will be updated using the October 2006 RBC Table.

12. The reference date given for EPA’s Integrated Risk Information System (IRIS) is 2004. Given that IRIS is updated several times a year, it is unclear why NAPR did not reference the date as 2006. Based on a cursory review of the recently updated data provided in IRIS, it does not appear that new toxicity data have been added for any of the site COPCs since 2004; however, NAPR should verify this observation and update the reference to 2006 (or 2007), as necessary.

Navy Response: The reference date given for IRIS will be changed from 2004 to 2007.

Section 7.1.3.2, Birds, Page 7-4

13. The discussion in the last paragraph on page 7-4 should be revised to indicate whether suitable foraging habitat exists at SWMU 14 for the yellow-shouldered blackbird (*Agelaius xanthomus*). If so, the screening-level ecological risk assessment (SERA) should be revised to discuss how risks to this species can be evaluated. For example, if the American robin (*Turdus migratorius*) can be used appropriately as a surrogate receptor to evaluate risks to the blackbird, this should be noted in relevant sections of the SERA.

Navy Response: The habitat at SWMU 14 is limited to maintained grasses (unknown species composition). Given that yellow-shouldered blackbirds are arboreal feeders that forage in the canopy and sub-canopy of trees (USFWS, 1996), they are not expected to forage within the available habitat at SWMU 14. The text in Section 7.1.3.2 will be revised to include this discussion. Although yellow-shouldered blackbirds are not expected to forage within available habitat at SWMU 14, Section 7.3.2.1 also will be revised to show that the American robin can be protectively used as a surrogate receptor based on aspects of the feeding ecology of both species (i.e., diet).

Section 7.4.1, Media-Specific Screening Values, Page 7-13

14. This section indicates that, when more than one threshold was available from the specified sources (i.e., Efroymsen et al. 1997a and b, USEPA 2005a, both as cited in the RFI), the lowest value was selected as the screening value. Note that, rather than using the lowest value from these sources, it is recommended that EPA Ecological Soil Screening Levels (Eco-SSLs) be used in preference to other screening values, when available. Because the Eco-SSLs are based on a more recent and comprehensive literature review, they are preferred over other available sources. Also, it appears that some of the most recently updated Eco-SSLs (e.g., Eco-SSL for copper, dated July 2006) may not have been used in Table 7-4. Finally, it is unclear whether Eco-SSLs were considered for all receptor groups, or whether Eco-SSLs were used for terrestrial plants and invertebrates only. Section 7.4.1 should be revised to clarify this point, and screening values in Table 7-4 should be updated, if necessary.

Navy Response: Section 7.4.1 and Table 7-4 will be revised to show that available USEPA ecological soil screening levels (Eco SSLs) for terrestrial plants and invertebrates were preferentially used as soil screening values. Available Eco-SSLs for terrestrial birds were not used in the screening-level ERA. Instead, exposures and risks to these upper trophic level receptors were evaluated using the approach in Sections 7.5.2.2 and 7.6.1, respectively. However, Table 7.5 (Ingestion-Based Screening Values for Birds) will be revised to reflect the use of ingestion-based toxicity reference values (TRVs) used by the USEPA in the derivation of Eco-SSLs for birds. Upper trophic level risk estimates summarized in Tables 7-13 and 7-14 and associated text in Section 7.6.3.2 also will be revised to reflect the use of the USEPA TRVs as ingestion-based screening values. It is noted that soil standards from the Ministry of Housing Spatial Planning and Environment (MHSPE) and Canadian soil quality guidelines from the

Canadian Council of Ministers of the Environment (CCME) have been updated. As such, soil screening values taken from these two sources and risk estimates also have been revised to reflect current MHSPE (2000) and CCME (2006) values.

Section 7.5.2, Exposure Estimation, Page 7-16

15. This section and Table 7-6 should be revised to clarify the toxic equivalency factors (TEFs) that were used to calculate 2,3,7,8-TCDD equivalents. Note that different TEFs are available for birds, mammals, and fish, and the applicable TEFs should be chosen according to the receptor(s) being evaluated. It should also be noted that TEFs are not available specifically for plants and invertebrates, and this data gap should be discussed in the uncertainties section (Section 7.7). Refer to EPA's *Draft Framework for Application of the Toxicity Equivalence Methodology for Polychlorinated Dioxins, Furans, and Biphenyls in Ecological Risk Assessment* (June 2003, available at <http://cfpub.epa.gov/ncea/raf/recordisplay.cfm?deid=55669>) for TEFs for birds and fish, and recently updated World Health Organization mammalian TEFs (May 2005, available at http://www.who.int/ipcs/assessment/tef_update/en/index.html).

Navy Response: Table and Section 7.5.2 will be reviewed to reflect the use of toxicity equivalence factors (TEFs) for birds (Van den Berg et. al., 1997). Risk estimates, as well as associated tables and text will be revised to reflect the use of these TEF values. As TEFs are not available for terrestrial plants and invertebrates, Section 7.5.2, as well as associated tables and text presenting and discussing risk estimates, will be revised to reflect the comparison of individual congener concentrations directly to the 2,3,7,8-TCDD screening value. This is an extremely conservative approach since available literature indicates that plants and invertebrates are insensitive to 2,3,7,8-TCDD induced toxicity (USEPA, 2003b). Finally, Section 7.7 will be revised to include the uncertainty associated with the lack of TEFs for plants and invertebrates, as well as the uncertainty associated with comparison of congener concentrations directly to the 2,3,7,8-TCDD screening value.

Section 7.6.1, Selection of Ecological Chemicals of Potential Concern, Page 7-20

16. The final paragraph in this section acknowledges the potential for multiple chemicals to interact, and indicates that these interactions can be addressed by site-specific studies in Step 6 of the Navy ERA process. Given the well-established fact that toxicity to polycyclic aromatic hydrocarbons (PAHs) occurs additively (e.g., EPA's November 2003 *Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks [ESBs] for the Protection of Benthic Organisms: PAH Mixtures*), the cumulative effects of PAHs should be considered in the SERA. This can be accomplished by summing the exposure concentrations of all PAHs and comparing the total PAH concentration to a total PAH screening level, or by summing the hazard quotients of the individual PAHs to calculate a single hazard index for PAHs. Although the methodology used in the SWMU 14 SERA has been approved for SERAs at other SWMUs, changes to the previously approved methodologies are sometimes needed to account for advances in the state of the science. Note that the outcome of this recommended change is that all PAHs will be brought forward as COPCs in the baseline ERA, rather than just the subset of PAHs currently

identified in the SERA. The SERA should be revised accordingly.

Navy Response: Sections 7.6.2.1 and 7.6.2.2 will be revised to include a comparison of total PAH concentrations to a total PAH toxicological benchmark (MHSPE, 2000). As this comparison will result in the identification of each PAH analyzed for in SWMU 14 surface and subsurface soil as ecological COPCs, associated text and tables will also be revised to show the identification of all PAHs as ecological COPCs.

Section 7.7, Uncertainties Associated with the Screening-Level Ecological Risk Assessment, Page 7-26

17. In the “Ecological Receptors” subsection of Section 7.7, the uncertainties associated with the omission of bats as receptors in the ecological risk evaluation should also be noted. The SERA should be revised accordingly.

Navy Response: Although exposures to bats are likely to be negligible at SWMU 14, Section 7.7 will be revised to include a discussion of the uncertainties associated with the omission of representative bat species as ecological receptors.

Tables 6-1 through 6-3, Surface Soil/Subsurface Soil/Groundwater Data and COPC Selection Summaries

18. Based on a spot check of the RBC values and COPC selection process for a subset of compounds, NAPR appears to have selected site COPCs appropriately (i.e., in accordance with the Revised Final RFI Work Plan for SWMU 14 dated December 29, 2005, and discussion in Section 6.2.2). However, RBC values for the following carcinogenic PAHs are listed incorrectly in Tables 6-1 through 6-3 because they were updated in the October 2006 RBC Table: benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene (see Specific Comment No. 6). The updated RBC values do not appear to affect the end result of the COPC selection process, but will alter the rationale behind retaining several PAHs (e.g., see benzo[k]fluoranthene on Table 6-1 and benzo[b]fluoranthene on Table 6-3). NAPR should verify the RBC values used in the COPC selection process and make the necessary changes to these tables to ensure that all information is presented accurately.

Navy Response: Tables 6-1 through 6-3 will be updated using the October 2006 RBC Table.

Figure 6-1, Conceptual Site Model

19. The Conceptual Site Model (CSM) figure includes ingestion of groundwater as a future exposure pathway for future adult construction workers. However, this exposure pathway is not discussed in the text (see page 6-8) and associated risks were not estimated (see Tables 6-15 and 6-16). NAPR should clarify whether this was simply an

oversight, or whether ingestion of groundwater (i.e., from a potable water source or via incidental ingestion) is an exposure pathway that should be addressed, either qualitatively or quantitatively, for future construction workers. Figure 6-1 should also be corrected if necessary.

Navy Response: Figure 6-1 will be revised to remove ingestion of groundwater as a future exposure pathway for the future adult construction worker.

20. Inhalation of volatile emissions emanating from groundwater is discussed in the text (pages 6-7 to 6-8) as a potential future exposure pathway for both future adult and child residents; however, it was not included on the CSM figure for the child resident (see General Comment No. 1). Depending on the resolution of General Comment No. 1, Figure 6-1 should be revised or retained, as appropriate.

Navy Response: Figure 6-1 will not be revised to include inhalation of volatile emissions emanating from groundwater as a potential future exposure pathway for the future young child resident. Section 6.3.1 will be revised to state that inhalation of volatiles in groundwater was evaluated only for the future residential adult. Please refer to response to General Comment No. 1.

Figure 7-6, Preliminary Conceptual Model

21. Figure 7-6 indicates that mammals were evaluated quantitatively, when in fact, risks to mammalian receptors were *not* quantitatively evaluated. This figure should be revised to correct this error.

Navy Response: Figure 7-6 will be revised to show that mammals were not quantitatively evaluated by the screening-level ERA.