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TRANSMITTAL LETTER FOR REPLACEMENT PAGES FOR CORRECTIVE MEASURES
STUDY FINAL REPORT FOR SOLID WASTE MANAGEMENT UNIT 53 DATED 23 JULY 2003
NAVAL ACTIVITY PUERTO RICO
11/24/2003
BAKER ENVIRONMENTAL, INC.

Baker

N40003-001396

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November 24, 2003

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 Caribbean Section

Re: Contract N62470-95-D-6007
Navy CLEAN, District III
Contract Task Order (CTO) 0099
U.S. Naval Station Roosevelt Roads (NSRR), Puerto Rico
RCRA/HSWA Permit No. PR2170027203
Final Corrective Measures Study (CMS) Final Report for SWMU 53
Final CMS Investigation Report for SWMU 53
Response to EPA Comments Dated September 12, 2003

Dear Mr. Everett:

Baker Environmental, Inc. (Baker), on behalf of the Navy, is providing you with two copies of the replacement pages for the CMS Final Report for SWMU 53 dated July 23, 2003. These replacement pages make up the Final version of the document. Replacement pages are also included for the CMS Investigation Report for SWMU 53 dated July 23, 2003 that is found within Appendix A of the CMS Final Report, but separately bound for ease of review. These replacement pages make up the Final version of the document. Directions for inserting the replacement pages into the Draft CMS Final Report and Draft CMS Investigation Report for SWMU 53 are provided for your use.

These two documents are being submitted in response to the EPA Comment letter dated September 12, 2003 that provided comments on the Draft CMS Final Report and Draft CMS Investigation Report for SWMU 53. These comments were provided to the Navy on October 23, 2003 during the Naval Station Roosevelt Roads Joint Interest Group meeting held at your office.

Also included with this submission of replacement pages is the Navy Response to EPA Comments dated September 12, 2003 on the Draft CMS Final Report and Draft CMS Investigation Report for SWMU 53.

ChallengeUs.

Baker

Mr. Adolph Everett, P.E.
November 24, 2003
Page 2

If you have any questions regarding this submittal, please contact Mr. Kevin Cloe, P.E. at 757-322-4736.
Additional distribution has been made as indicated below.

Sincerely,

BAKER ENVIRONMENTAL, INC.



Mark E. Kimes, P.E.
Activity Manager

MEK/lp
Attachments

cc: Mr. Kevin R. Cloe, LANTDIV - Code EV23KRC (1 copy)
Ms. Madeline Rivera, NSRR (4 copies)
Mr. Tim Gordon, US EPA, Region II (2 copies)
Mr. John Tomik, CH2M Hill, Virginia Beach (1 copy)
Ms. Kathy Rogovin, Booz Allen & Hamilton (1 copy)
Mr. Carl Soderberg, US EPA, Caribbean Office (1 copy)
Mr. Carmelo Vasquez, PR EQB (2 copies)

**NAVY RESPONSE TO EPA COMMENTS
DATED SEPTEMBER 12, 2003 ON THE
DRAFT CORRECTIVE MEASURES STUDY
INVESTIGATION REPORT FOR SWMU 53**

Booz Allen Hamilton General Comment No. 1

1. *Booz Allen reviewed the above-referenced Draft Corrective Measures Study (CMS) Investigation Report, dated July 23, 2003. The review identified some data gaps in the delineation of contamination at the site and deviation from the approved work plan. The investigation report should be revised to describe the uncertainty in the delineation of contamination, as described below.*

Navy Response to BAH General Comment No. 1

The investigation report has been revised to describe the deviation of the approved work plan and to address delineation of contamination. Also, see response to Specific Comment No. 2 in response to any uncertainties in the delineation of contamination in the soil at SWMU 53.

Booz Allen Specific Comment No. 1

Section 1.2.2 SWMU 53, Building 64 (Malaria Control Building)

1. *The gradient across the site is described as sloping gently from northeast (upgradient) to southwest (downgradient). Based on the topographic lines on Figure 2-1, the gradient would more accurately be described as sloping from the southeast (upgradient) to northwest (downgradient). This point should be clarified as it has a direct bearing on the adequacy of delineation downgradient of sample locations 53SB14 and 53SS02.*

Navy Response to BAH Specific Comment No. 1

The typographical error in the text will be corrected as suggested. Do not agree with the comment concerning adequacy of delineation down gradient of sample locations 53SB14 and 53SS02. See the following response to comments for additional details concerning this statement.

Booz Allen Hamilton Specific Comment No. 2

Section 2.2 Surface Soil Investigation, Page 2-3

2. *Section 2.2 describes the implementation of the phased sampling and analysis protocol for pesticides in surface soil. According to this section, surface soil samples were collected from all of the proposed sample locations, and the laboratory extracted all of the samples. Initially, only samples 53SS07, 53SS08, and 53SS08D were analyzed to determine the concentration of heptachlor, heptachlor epoxide, and chlordane in the samples, which is in accordance with the Final CMS Work Plan, dated March 7, 2003. Because the results for sample 53SS07 exceeded the ecological screening criteria for chlordane, the laboratory proceeded with analysis of samples 53SS09, 53SS10, and 53SS11. However, the*

laboratory failed to analyze samples 53SS12 and 53SS13, as required by Figure 3-3 of the work plan. This omission increases the uncertainty in the delineation of contamination to the west and northwest of sample 53SB14. This section of the report should be revised to describe this omission and Section 3.1 should be revised to describe the effect of this omission on the delineation of pesticide contamination.

Navy Response to BAH Specific Comment No. 2

Do not agree with comment. Samples 53SB02, 53SS08, 53SS10, 53SS09, and 53SS03 totally encircle the chlordane, heptachlor, and heptachlor epoxide contamination present at samples 53SB14 and 53SS07. Samples 53SS13 and 53SS12 are located west of the line of delineation provided by samples 53SB02, 53SS08, and 53SS10. It was due to this fact along with sample 53SS08 being non-detect for the pesticides of concern that samples 53SS12 and 53SS13 were not analyzed. It should also be noted that the distance between samples 53SB02 and 53SS08 is only 18 feet.

Booz Allen Hamilton Specific Comment No. 3

Table 2-1 Summary of Sampling and Analytical Program, Page 1 of 1

- 3. Table 2-1 indicates that no sample was collected and extracted for pesticide analysis from sample location 53SS13. This contradicts the chain-of-custody form in Appendix A, which indicates that the sample was collected and instructs the laboratory to extract the sample and hold it for later analysis. According to the work plan, a sample from this location should have been collected, extracted, and analyzed, due to the exceedance of ecological screening criteria in sample 53SS07. The table should be revised to clarify whether sample 53SS13 was collected and extracted, and include a footnote describing the rationale for the deviation from the work plan if it was not collected and extracted.*

Navy Response to BAH Specific Comment No. 3

Table 2-1 will be corrected to indicate that sample 53SS13 was collected, extracted, and held for pesticide analysis by the laboratory. Please refer to Navy's response to Specific Comment No. 2, to answer any questions dealing with uncertainties or omissions with the March 2003 pesticide data.

Booz Allen Hamilton Specific Comment No. 4

Section 3.1 Surface Soil, Page 3-3

- 4. As described above in Specific Comment 2, there is some uncertainty regarding the delineation of pesticides to the west and northwest of sample 53SB14 because samples 53SS12 and 53SS13 were not analyzed. This uncertainty is increased by the fact that samples 53SB10 and 53SB13 also were not analyzed for the pesticides of concern, as described in Specific Comment 5, below.*

Similarly, there is uncertainty in the extent of 4,4'-DDE contamination north and west of sample 53SS02, because samples 53SB10 through 53SB13 also were not analyzed for this constituent.

Finally, there is uncertainty in the extent of chlordane and kepone contamination south of sample 53SB09 because sample 53SB20 was not analyzed for these constituents.

This section of the report should be revised to describe the uncertainty in the delineation of contamination in these areas due to the fact that 10 of the samples were field screened only for 4,4'-DDT, as described in Specific Comment 5, below.

Navy Response to BAH Specific Comment No. 4

Please see response to Specific Comment No. 2 in regards to any uncertainty regarding the delineation of pesticides to the west and northwest of sample location 53SB14.

Do not agree with the comment concerning the uncertainty in the extent of 4,4'-DDE contamination north and west of sample 53SS02. The samples in question were tested in the field with the EnviroGard DDT in soil Test Kit. The EPA approved Final RCRA Facility Investigation Work Plan SWMUs 53 and 54 (Baker, 2001) provided detailed information with respect to the field test kits utilized during that investigation as Appendix A.1. It should be noted that the EnviroGard DDT immunoassay test does not differentiate between 4,4'-DDT and other organochlorines. 4,4'-DDD, 4,4'-DDE, DDA, chloropropylate, chlorobenzilate, dicofol, and tetradifon are listed as the other organochlorines which if present can generate a positive detection for DDT in soil. The test kit utilized during the 2002 RFI investigation provided non detect results for DDT in soil for the samples in question 53SB10 through 53SB13. This means that 4,4'-DDE is not present from these sample locations equal to or greater than the MDL of 600 ug/kg for these samples. Therefore the extent of 4,4'-DDE contamination to the north and west of sample 53SS02 was delineated. The text will be modified to ensure that this information concerning the organochlorines is clearly explained.

Agree that there is uncertainty in the extent of chlordane and kepone contamination south of sample 53SB09 due to 53SB20 only being screened in the field with the EnviroGard DDT in soil test kit. The remedial action described in the document from which this document is appended will deal with the uncertainty through the soil removal and confirmation sampling.

Comment noted. This section of the report will be revised to discuss the uncertainty with respect to chlordane and kepone south of sample 53SB09. As mentioned in BAH's General Comment No. 2 on the Draft CMS Final Report, "These data gaps do not affect the selection of the corrective action identified in the CMS Final Report, and additional delineation of these contaminants is not required prior to corrective measures implementation (CMI)." Therefore, any uncertainties associated with chlordane and kepone within sample location 53SB09, will be addressed with remediation during the CMI stage as mentioned in Section 6 of the Draft CMS Final Report for SWMU 53. The proposed remediation will be soil excavation accompanied by a round of confirmation samples to verify that all contaminated soil, has been removed from this site.

Booz Allen Hamilton Specific Comment No. 5

Figure 3-1 Pesticide Investigation Results in Surface Soil

5. *Sample 53SS13 is missing from Figure 3-1 and should be added.*

Figure 3-1 indicates that 10 samples (53SB07, 53SB08, 53SB10 through 53SB13, 53SB15, and 53SB18 through 53SB20) were field-screened only for 4,4'-DDT. This contradicts figures in the work plan that specified that these samples were non-detect for chlordane, heptachlor, and heptachlor epoxide. The fact that these samples were not analyzed for chlordane, heptachlor, and heptachlor epoxide, as previously indicated, further increases the uncertainty of delineation of chlordane and heptachlor epoxide to the west of sample 53SB14. In addition, it increases the uncertainty of delineation of chlordane and kepone contamination to the south of sample 53SB09 and 4,4'-DDE contamination to the north and west of sample 53SS02, because the samples were not analyzed for 4,4'-DDE, chlordane, or kepone.

As described in Specific Comment 4, above, Section 3.1 should be revised to describe the uncertainty of contaminant delineation in these areas.

Navy Response to BAH Specific Comment No. 5

Figure 3-1 will be corrected to include 53SS13.

Figure 3-1 found within the Final CMS Work Plan for SWMU 53 dated January 7, 2003, is incorrect in reference to the samples listed in specific comment 5, and the analysis requested. These samples were not analyzed for heptachlor, heptachlor epoxide, and chlordane as previously indicated in the Final CMS Work Plan. These samples were screened in the field for organochlorine pesticides as described in the response BAH Specific Comment No. 4 above. Therefore, the information listed on Figure 3-1 of the Draft CMS Investigation Report for the samples listed above is accurate. See the above responses concerning the issue of uncertainty of delineation.

**NAVY RESPONSE TO EPA COMMENTS
DATED SEPTEMBER 12, 2003 ON THE
DRAFT CORRECTIVE MEASURES STUDY FINAL REPORT FOR SWMU 53**

Booz Allen Hamilton General Comment No. 1

1. *Booz Allen reviewed the above-referenced Corrective Measures Study Final Report (CMS Report), dated July 23, 2003. The scope of the evaluation and content of the report are generally consistent with the requirements established in the work plan. The recommended remedy, excavation and off-site disposal, is appropriate.*

Navy Response to BAH General Comment No. 1

Comment noted.

Booz Allen Hamilton General Comment No. 2

2. *As described in the comments on the CMS Investigation Report, delineation of pesticide contamination is uncertain in some areas, and the CMS Investigation Report recognizes that metals that exceeded ecological screening criteria have not been fully delineated. As described below, there is also some uncertainty in the delineation in the depth of contamination because the location of the subsurface samples often did not coincide with the elevated concentrations in surface soil. The description of current conditions in Section 2 of this report should be expanded to describe these uncertainties in contaminant delineation.*

These data gaps do not affect the selection of the corrective action identified in the CMS Final Report, and additional delineation of these contaminants is not required prior to corrective measures implementation (CMI). However, subsequent CMI plans should include procedures to ensure that the full extent of contamination is excavated and disposed, and the Confirmation Sampling Plan should include adequate samples to establish the adequacy of the excavation.

Navy Response to BAH General Comment No. 2

The uncertainties associated with the pesticide contamination, as well as with the depth of contamination will be addressed. The recommended remedy proposed in Section 6.0 of the Draft CMS Final Report for SWMU 53 clearly explains the process in which the soil at SWMU 53 will be remediated (through excavation and disposal). Therefore, any uncertainties or data gaps that are in question will be addressed by the proposed remedy. This remedy, along with adequate confirmation samples to verify the remediation of contaminants horizontally and vertically from the excavation, will remove any risk to human health or the environment at this site.

Subsequent CMI plans will include procedures to ensure that the full extent of contamination is excavated and disposed of, as well as include confirmation sample procedures to establish the adequacy of the excavation. Please see response to Specific Comment No. 8 in regards to the confirmatory sampling that will take place during the remediation process.

Booz Allen Hamilton General Comment No. 3

3. *The screening-level ecological risk assessment (ERA) and ecological corrective action objectives (CAOs) presented in the CMS report are acceptable following minor revisions specified in the following specific comments.*

Navy Response to BAH General Comment No. 3

See the response to Specific Comment Nos. 4, 5, and 6 below.

Booz Allen Hamilton Specific Comment No. 1

Section 2.1 General Site Description SWMU 53 - Building 64 (Malaria Control Building), Page 2-1

1. *The gradient across the site is described as sloping gently from northeast (upgradient) to southwest (downgradient). Based on the topographic lines on Figure 2-3, the gradient would more accurately be described as sloping from the southeast (upgradient) to northwest (downgradient). This point should be clarified as it has a direct bearing on the adequacy of delineation downgradient of sample locations 53SB14 and 53SS02.*

Navy Response to Specific Comment No. 1

The typographical error in the text will be corrected as suggested.

Booz Allen Hamilton Specific Comment No. 2

Section 2.3.1.2 RFI Investigation, Page 2-4

2. *The second paragraph indicates that only chlordane and heptachlor epoxide in sample 53SB14-00 exceeded the residential Risk Based Concentrations (RBCs). However, Figure 2-4 indicates that kepone exceeded both the residential and industrial RBCs in sample 53SB09 and 53SB14. The text should be revised to describe the kepone results at this location.*

Navy Response to Specific Comment No. 2

The text found in Section 2.3.1.2 of the Draft CMS Final Report describes chlordane and heptachlor epoxide results in sample 53SB14-00 as exceeding the residential RBCs. The rationale for this is that during the development of the Draft RFI Report, the RBCs for both industrial and residential for kepone was NE (Not Established). Therefore, kepone did not exceed any RBC values at that time. The RBC values for kepone were first published in October 2002 and modified in April 2003. During the development of the Draft CMS Investigation Report, and concurrently, the Draft CMS Final Report, the RBC values for kepone were established as 360 and 80 micrograms per kilogram ($\mu\text{g}/\text{kg}$), respectively. Thus the reasoning for Figure 2-4 presenting the results for kepone at sample location 53SB09 and 53SB14 as exceedances. However, the text from the section mentioned above will be revised to include a brief discussion of the kepone exceedances. Section 3.1 of the Draft CMS Investigation Report also describes the kepone results at sample locations 53SB09 and 53BS14.

Booz Allen Hamilton Specific Comment No. 3

Section 2.3.2 Subsurface Soil Results, Page 2-5

3. *The subsurface soil sample results described in this section were not previously described in the CMS Work Plan or the CMS Investigation Report. The results indicate that there is not significant contamination of subsurface soils, which should be expected, given the nature of the contaminants in question. However, there is poor correlation between the location of the subsurface soil sample locations and the surface soil samples which indicated elevated contaminant concentrations. For example, elevated pesticide concentrations were detected in surface soil samples 53SS02, 53SS07, 53SB09, and 53SB14. According to Figure 2-6, subsurface soil samples were not analyzed for pesticides at any of these locations. Similarly, the highest metal concentrations were detected in surface soil samples 53SS03 through 53SS06. Subsurface soil samples were not collected at these locations. Additional vertical delineation of this contamination is not required prior to the excavation, provided that adequate confirmation samples are collected to verify that the depth of excavation is adequate.*

Navy Response to Specific Comment No. 3

Comment noted. The recommended remedy proposed in Section 6.0 of the Draft CMS Final Report for SWMU 53 clearly explains the process in which the soil at SWMU 53 will be remediated (through excavation and disposal). Therefore, as mentioned above, any uncertainties or data gaps that are in question will be addressed by the proposed remedy. This remedy, along with adequate confirmation samples to verify the removal of COC's horizontally and vertically, will remove any risk to human health or the environment at this site. See response to Specific Comment No. 8 in regards to the confirmation sampling during the remediation process.

Booz Allen Hamilton Specific Comment No. 4

Section 3.3.2 Endpoints and Risk Hypotheses, Page 3-9

4. *Table 3-3 lists measurement endpoints for terrestrial ecological receptors applicable to Steps 1 and 2 of the ERA. Table 3-3 should indicate that measurement endpoints for Step 3a of the ERA were based on average exposure concentrations.*

Navy Response to Specific Comment No. 4

A footnote will be added to Table 3-3 to indicate that measurement endpoints for Step 3a of the baseline ecological risk assessment are based on mean exposure concentrations.

Booz Allen Hamilton Specific Comment No. 5

Section 3.7.2 Uncertainties Associated With the Refined Screening-Level Risk Characterization, Pages 3-27 to 3-30

5. *The discussion of uncertainties of chemical mixtures should include a specific discussion regarding the potential to underestimate risks because of the synergistic or additive toxicity of pesticides. DDT and metabolites are known to*

act additively, but this is not mentioned. Other pesticides may act synergistically or additively and this should be specifically noted as an uncertainty that may lead to an underestimate of risk.

Navy Response to Specific Comment No. 5

The seventh bullet item in Section 3.7.2 (Uncertainties Associated with the Refined Screening-Level Risk Assessment), Page 3-29 includes a discussion of the uncertainty associated with chemical interactions (i.e., additive, synergistic, and antagonistic effects). Specifically, the discussion states that because chemicals were evaluated in the ecological risk assessment on a compound-by-compound basis, an underestimation of risks could result if there are additive or synergistic effects among chemicals. As such, additional discussion is not necessary.

Booz Allen Hamilton Specific Comment No. 6

6. *The discussion of uncertainties should also note that the proposed soil removals for those chemicals with CAOs will also reduce risks of all co-located chemicals that were identified as contaminants of potential concern.*

Navy Response to Specific Comment No. 6

The uncertainties presented in Section 3.7.2 (Uncertainties Associated with the Refined Screening-Level Risk Assessment) are specific to Step 3a of the baseline ecological risk assessment. However, a discussion of the impact of the proposed corrective measures for those chemicals with CAOs on risks for co-located chemicals will be added to Section 4.2 (Identification of Corrective Action Objectives), Page 4.3.

Booz Allen Hamilton Specific Comment No. 7

Section 6.1 Description of the Remedy, Page 6-1

7. *The cleanup levels listed for heptachlor epoxide and arsenic are significantly higher than those in Table 6-1 and are not supported by the risk assessment calculations in Appendix E. The cleanup level for heptachlor epoxide should be corrected to read from 270 µg/kg to 53 µg/kg, and the cleanup level for arsenic should be corrected to read from 27 µg/kg to 3.9 µg/kg.*

Navy Response to Specific Comment No. 7

The cleanup levels for heptachlor epoxide and arsenic found on page 6-1 will be corrected to incorporate the values listed above. However, the unit for arsenic found on page 6-1 should be mg/kg (milligrams per kilogram) and not ug/kg (micrograms per kilogram) as listed above for arsenic.

Booz Allen Hamilton Specific Comment No. 8

Section 7.1.3 Confirmation Sampling Plan, Page 7-3

8. *The proposed confirmation sampling strategy is inadequate, given the uncertainty in both the horizontal and vertical delineation of contamination. The confirmation sampling strategy should be revised to address the previously stated*

concerns regarding the adequacy of the delineation. Adequate confirmation samples must be collected to demonstrate that all contamination exceeding the CAOs has been removed. In particular, the following revisions are recommended: 1) clarify that confirmation samples collected from the perimeter of the excavation will be collected from the upper foot of undisturbed soil outside the excavation boundary (i.e., sidewall); 2) confirmation samples should be collected from the floor of the excavation on a 25-foot grid spacing to verify that the depth of the excavation is adequate; and 3) additional confirmation samples should be collected from biased locations to further establish the adequacy of the excavation in known areas of uncertainty.

Navy Response to Specific Comment No. 8

Concur. Additional confirmatory sampling along the bottom of the excavation will be added to ensure that the excavation has removed all contamination exceeding the CAOs. This sampling will occur at a frequency of one sample on 25-foot grid spacing in the excavation. It should be noted that bedrock is very shallow at this site. Confirmation samples from the bottom of the excavation will only be obtained if soil is present to obtain a sample from within the grid. Additional biased confirmation samples will be taken to further establish the adequacy of the excavation in known areas of uncertainty. Specific activities to confirmatory sampling will be specified in the design.

Booz Allen Hamilton Specific Comment No. 9

Figure 7-1 SWMU 53 Conceptual Design Plan

9. *The proposed locations of the equipment laydown and decontamination area and the soil staging area should be reevaluated. The equipment laydown and decontamination area is situated between two monitoring wells, which appear to be only 20 feet beyond the perimeter of the area. The soil staging area is only about 60 feet from one of the wells. Both areas should be relocated unless adequate measures are identified in the CMI plans to protect the monitoring wells from damage by heavy equipment and ensure that they are not impacted by contaminated runoff from the decontamination and soil staging activities.*

Navy Response to Specific Comment No. 9

Adequate measures will be taken to ensure that the monitoring wells will not be damaged during implementation of the remedial action. In addition, adequate control of runoff from the soil staging area and decontamination area will be performed to ensure that contamination will not impact the wells or leave the respective areas. Specific activities related to these concerns will be specified in the design.

Booz Allen Hamilton Specific Comment No. 10

10. *In addition, the legend for the figure should be completed so that it is clear that the blue boundary represents the proposed excavation boundary.*

Navy Response to Specific Comment No. 10

The legend for Figure 7-1 will be revised to clearly indicate that the blue boundary represents the proposed excavation boundary.