

September 12, 2003
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REPA3-0203-017

Patricia Rosa
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U.S. EPA Region 2
290 Broadway, 22nd Floor
New York, NY 10007-1866

Subject: EPA Contract No. 68-W-02-037, Work Assignment R02703, Naval Station Roosevelt Roads, Task 4. Technical Review of the July 23, 2003, Draft Corrective Measures Study Investigation Report for SWMU 53 and Technical Review of the July 23, 2003 Draft Corrective Measures Study Final Report for SWMU 53, Naval Station Roosevelt Roads, Ceiba, Puerto Rico.

Dear Ms. Rosa:

In response to Work Assignment R02703, under EPA Contract No. 68-W-02-037, Booz Allen Hamilton has reviewed the July 23, 2003, Draft Corrective Measures Study (CMS) Investigation Report for SWMU 53 and the July 23, 2003, Draft CMS Final Report for SWMU 53 at Naval Station Roosevelt Roads (NSRR) in Ceiba, Puerto Rico.

Our review of the Draft CMS Investigation Report 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 discussed in the specific comments provided in an attached deliverable. Our review of the Draft CMS Final Report determined that 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. General and specific comments regarding the CMS Final Report are also provided in an attached deliverable.

If you have any questions regarding this deliverable, please contact me at (617) 428-4441.

Sincerely,

Kathy Rogovin
Work Assignment Manager

BOOZ ALLEN HAMILTON

cc: Tim Gordon, Work Assignment Manager
Susan Neiheisel, Contracting Officer (cover letter only)
Amanda Kreusch, Contract Specialist (cover letter only)
Booz Allen EPMT QA/QC Coordinator

**TECHNICAL REVIEW OF THE
DRAFT CORRECTIVE MEASURES STUDY INVESTIGATION
REPORT FOR SWMU 53**

**NAVAL STATION ROOSEVELT ROADS
CEIBA, PUERTO RICO**

REPA3-0203-017

September 12, 2003 [slightly revised by EPA October 21, 2003]

I GENERAL COMMENTS

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.

II SPECIFIC COMMENTS

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.

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.

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.

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.

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.

**TECHNICAL REVIEW OF THE
DRAFT CORRECTIVE MEASURES STUDY FINAL REPORT FOR SWMU 53**

**NAVAL STATION ROOSEVELT ROADS
CEIBA, PUERTO RICO**

REPA3-0203-017

September 12, 2003 [slightly revised by EPA October 21, 2003]

I GENERAL COMMENTS

3. 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.

4. 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.

5. 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.

II SPECIFIC COMMENTS

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

6. 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.

Section 2.3.1.2 RFI Investigation, Page 2-4

7. 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.

Section 2.3.2 Subsurface Soil Results, Page 2-5

8. 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.

Section 3.3.2 Endpoints and Risk Hypotheses, Page 3-9

9. 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.

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

10. 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.

11. 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.

Section 6.1 Description of the Remedy, Page 6-1

12. 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.

Section 7.1.3 Confirmation Sampling Plan, Page 7-3

13. 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.

Figure 7-1 SWMU 53 Conceptual Design Plan

14. 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.
15. In addition, the legend for the figure should be completed so that it is clear that the blue boundary represents the proposed excavation boundary.