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March 5, 2009

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 N69450-08-R-0093
Corrective Action for SWMUs 14, 56, 68, and 69
Naval Activity Puerto Rico, Ceiba, Puerto Rico
U.S. Naval Activity Puerto Rico (NAPR)
EPA I.D. No. PR2170027203
Draft Final Corrective Measures Study Final Report for SWMU 68

Dear Mr. Everett:

Right Way Environmental Contractors, Inc. (RWEC), on behalf of the Navy, is pleased to provide you with one hard copy of the replacement cover and spine, inside cover, text, tables, figures, and appendix for the Draft Corrective Measures Study Final Report for SWMU 68. These replacement pages make up the Draft Final Corrective Measures Study Final Report for SWMU 68. Directions for inserting the replacement pages for each report are provided for your use. Also included with each hard copy is an electronic copy provided on CD of the Draft Final Corrective Measures Study Final Report for SWMU 68.

These documents are being submitted in accordance with the EPA comments dated January 15, 2009. The Navy responses to these comments are attached for your review. Additional distribution has been made as indicated below.

If you have questions regarding this submittal, please contact Mr. David Criswell at (843) 743-2130.

Sincerely,
Right Way Environmental Contractors, Inc.



Pedro R. Tejada
Vice President

Attachments

cc: Ms. Debbie R. Sanders, BRAC PMO SE (letter only)
Mr. David Criswell, BRAC PMO SE (letter only)
Mr. Mark E. Davidson, BRAC PMO SE (1 hard copy and 1 CD)
Mr. Pedro Ruiz, NAPR (1 CD)
Mr. Tim Gordon, US EPA Region II (1 hard copy and 1 CD)
Mr. Carl Soderberg, US EPA Caribbean Office (1 hard copy and 1 CD)
Mr. Manny Vargas, PR EQB (1 hard copy and 1 CD)
Ms. Willmarie Rivera, PR EQB (1 CD)
Mr. Felix Lopez, US F&WS (1CD)
Mr. Michael Smith, TechLaw, Inc. (1 CD)

NAVY RESPONSE TO EPA COMMENTS DATED JANUARY 15, 2009

**EPA COMMENTS ON THE
DRAFT CORRECTIVE MEASURES STUDY FINAL REPORT FOR SWMU 68
DATED OCTOBER 28, 2008**

(EPA comments are provided in italics, while the Navy responses are provided in regular print)

TECHLAW GENERAL COMMENTS

1. *A majority of the figures (e.g., Figures 2-5, 2-6, 2-7, 3-1, 3-2, 5-1) depict color-coded polygon features from 1961 and 1964. It is unclear what these polygon features signify. Revise the Draft CMS Report to include an explanation of the polygon features shown on the figures.*

Navy Response to TechLaw General Comment 1:

The polygon features represent areas of historical soil disturbance based on aerial photo interpretation. Section 2.2 will be revised to include an explanation of the polygon features depicted on the figures.

2. *Several figures (most notably Figures 2-4, 2-5, and 3-1) depict a drainage feature extending from the western-most 1961 polygon feature. It is not clear that the extent of potential contamination in this drainage area was characterized at the time of the Phase I/Phase II Environmental Condition of Property (ECP) or Phase I RCRA Facility Investigation (RFI). Revise the Draft CMS Report to explain how any contaminated runoff was previously characterized.*

Navy Response to TechLaw General Comment 2:

The drainage feature west of the 1961 polygon has not been characterized during previous investigations. However, analytical data for two soil boring locations established immediately east of the drainage feature (i.e., 68SB07 and 68SB09; collected during the November 2006 RFI field investigations) indicate that chemicals have not migrated from historical areas of soil disturbance to the drainage feature at concentrations greater than human health and ecological screening values and/or background values. Furthermore, all analytical data for soil borings collected during the 2006 Phase I RFI field investigation, as well as surface soil samples collected during field investigations conducted in September and October 2007, indicate that contamination at the SWMU is restricted to areas surrounding two ECP sample locations (14E-01 and 14E-03; see Figures 3-1 and 3-2). Finally, the EPA has agreed that contamination at SWMU 68 has been adequately characterized based on their approval of the Revised Final Phase I RFI Report (see approval letter dated August 11, 2008). In summary, the Navy believes that contamination at the site has been adequately characterized by the Phase II ECP and Phase I RFI field investigations, and revisions to the document are not necessary. EPA's approval of the Final Phase I RFI Report and their recommendation for a "Streamlined CMS" supports this line of reasoning.

3. *Carcinogenic risk of 1.2E-06 and 2.8E-6 were calculated for future adult residents and future child residents, respectively. Both of these risk values exceed 1E-06, the lower bound of the U.S. Environmental Protection Agency's (EPA's) risk range. However, various sections of the Draft CMS Report (e.g., Section 3.1.1, CAO Development for Human Receptors) indicate that the preliminary risk values do not exceed the lower bound of EPA's risk range. Revise the Draft CMS Report to correct these inaccurate statements. In addition, because this property is being transferred out of federal control, land use controls should be implemented to prevent residential exposures. The*

exceedances of the lower bound of EPA's risk range indicate that SWMU 68 is not appropriate for unrestricted use. Revise the Draft CMS Report to discuss specific land use controls that will be enacted for SWMU 68.

Navy Response to TechLaw General Comment 3:

Sections 3.1.1 and 3.2.1 of the Draft Corrective Measures Study Final Report will be revised to state that the carcinogenic risk results “are within the USEPA acceptable carcinogenic risk range of 1×10^{-06} to 1×10^{-04} .”

Additionally, the following text will be added to the Draft Corrective Measures Study Final Report to discuss specific land use controls:

“A Naval Activity Puerto Rico, Airfield Transfer Quitclaim Deed (Deed) between the United States of America (acting by and through the Secretary of the Navy, Navy BRAC Program Management Office) and the Puerto Rico Ports Authority was signed on February 7, 2008. This Deed puts forth land use controls strictly prohibiting residential land use. Specifically, Section XXI of the Deed states that the use of the property is restricted to industrial and commercial purposes and that residential and residential-like uses (i.e., housing, child pre-school, day care or nurseries, adult convalescent or nursing home facilities) are strictly prohibited. Recreational uses such as parks or playgrounds and any agricultural uses are also strictly prohibited. Furthermore, Section XXIII of the Deed states that extraction, utilization and/or consumption of any water from the aquifer below the surface of the ground is prohibited within those individual SWMUs with land use controls listed in the Deed.”

4. *Section 5.1 indicates that post-excavation confirmatory sampling will not be required. While four “clean” sample locations have been used as the basis for determining the extent of lateral excavation in each area of contamination, given the size of the excavation areas, additional sampling should be conducted to confirm that all contamination has been removed. Revise the Draft CMS Report to include collection of confirmatory surface soil samples as follows:*

- *In the area of excavation surrounding sample location 14E-01, a confirmatory surface soil sample should be collected from each corner of the excavation and two additional surface soil samples should be taken from each 100-foot long wall.*
- *In the area of excavation surrounding sample location 14E-03, a confirmatory surface soil sample should be take from each 100-foot long wall*

In addition, the vertical extent of contamination has not been defined as soil samples in the areas of contamination were only collected to a depth of one foot below ground surface (as indicated in the Final Phase I RFI Report). Given that the property may be redeveloped and there is a potential that soils could be excavated and re-disturbed in the future, it will be necessary to confirm that all contamination has been removed from the bottom of the excavation. Thus, the Draft CMS Report should propose the collection of a representative number of confirmation samples from the base of the excavation.

Navy Response to TechLaw General Comment 4:

The Draft Corrective Measures Study Final Report will be revised to acknowledge that confirmation samples will be collected from the side walls and bottom of each excavation to confirm contamination has been removed. However, specific details of the confirmation sampling program will be provided as part of the Corrective Measure Implementation.

5. *Inorganic compounds detected above residential or industrial health-based screening criteria were eliminated as chemicals of potential concern (COPCs) in the preliminary screening process when detections did not exceed background levels. For example, vanadium was not carried forward in the human health risk evaluation even though concentrations exceeded health-based screening criteria in surface soil, subsurface soil, and groundwater. In addition, while soil exposures from arsenic were evaluated quantitatively because detections exceeded both human health risk-based screening criteria and background levels, groundwater exposures were not evaluated quantitatively because only risk-based levels were exceeded (and not background levels). This methodology is appropriate in a residual risk analysis, but is generally not acceptable, unless site-specific approval is obtained from the governing administrative authorities.*

Consistent with EPA's Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites (2002), all chemicals detected above the most relevant health-based screening criteria are to be retained as COPCs and assessed under total risk baseline conditions. While it is acknowledged that the human health evaluation presented in the Draft CMS Report does not represent a baseline human health risk assessment (BHHRA), to aid risk management decisions, total risk should be based on any exceedances of health-based screening criteria. If necessary, following the determination of total risk and hazard, the total expression of risk may be refined into three components to support corrective action objectives (CAOs): total risk, background risk, and residual (or site-related) risk. Therefore, it is recommended that the Draft CMS Report include inorganic compounds in the quantification of risk and hazard when health-based criteria are exceeded, and that a refined risk evaluation be conducted subsequently. Vanadium in soil and arsenic in groundwater should be included in the quantitative evaluation presented in Appendix C, Preliminary Human Health Risk Calculations for Arsenic. Revise the Draft CMS Report to include estimates of total risk, and present background risk and residual risk to facilitate risk management decisions and support CAOs.

Navy Response to TechLaw General Comment 5:

Comment noted. However, this document will not be revised to include evaluation of additional chemicals and/or media (i.e., vanadium in soil, arsenic in groundwater). The Preliminary Human Health Risk Calculations for Arsenic included in this Draft Corrective Measures Study Final Report were conducted as part of the EPA-approved Revised Final Phase I RCRA Facility Investigation Report for SWMU 68 (approved by the EPA in a letter dated August 11, 2008). These preliminary risk calculations were included in the Final Phase I RCRA Facility Investigation Report dated February 29, 2008. This screening approach was taken to eliminate those chemicals that exceeded screening criteria and background but would likely not drive risk (an approach approved by EPA during the September 20, 2007 conference call between the Navy, EPA, and PREQB). EPA provided comments on the Final Phase I RCRA Facility Investigation Report on May 13, 2008. There were no comments pertaining to the identification of inorganic compounds as COPCs in the preliminary screening process as only those detected above risk-based screening criteria and background levels.

It is acknowledged that those inorganic compounds exceeding risk-based screening criteria but not background were not evaluated in a formal BHHRA. However, as stipulated in the *Navy Policy on the Use of Background Chemical Levels in Risk Assessment* (2004), risks should be assessed for site related COPCs (those chemicals that exceed both risk-based screening criteria and background). Additionally, the 2004 Navy guidance precludes the development of cleanup levels for non-site related chemicals (i.e., those present at levels below background). Based on this rationale, vanadium in soil and arsenic in groundwater would have been eliminated from further consideration in a BHHRA, and CAOs would not have been developed. Therefore, since the methodology used in selecting the COPCs for the preliminary

risk calculations was approved as part the Phase I RFI for SWMU 68 and the inclusion of a human health risk evaluation for those inorganic compounds below background levels would not change the outcome of the Corrective Measures Study Final Report, the Navy does not believe that revisions to the Draft Corrective Measures Study Final Report based on this comment are required.

Note that COPC selection in future human health risk assessments conducted for NAPR will be consistent with *U.S. Navy Human Health Risk Assessment Guidance* (2008) (which states that risks may be presented with or without contribution from background). In other words, all chemicals detected above risk-based screening criteria will be retained as COPCs and assessed under total risk baseline conditions. Those chemicals at or below background levels (non-site related) will be discussed as a part of the risk characterization and then exit the risk assessment process.

6. *Appendix C, Preliminary Human Health Risk Calculations for Arsenic, lacks sufficient information to verify calculations. It is suggested that the following bulleted items be addressed:*

- *The toxicity values used to calculate risk and hazard are not provided. Revise Appendix C to provide the toxicity values used to calculate risk and hazard for arsenic exposures. Note that the most current oral cancer slope factor (SF_o) and oral noncancer reference dose (RfD_o) for arsenic are $1.5 (mg/kg-day)^{-1}$ and $3.0E-04 mg/kg-day$, respectively, and that the most current inhalation unit risk factor (URF_i) and inhalation reference concentration (RfD_i) for arsenic are $4.3E-03 (\mu g/m^3)^{-1}$ and $3.0E-05 (mg/m^3)$, respectively. Ensure all calculations reflect the most current toxicity values.*
- *The exposure parameters are based on default values. Consider using reasonable maximum exposure (RME) activity-specific surface area weighted soil adherence factors for adult and child residents (e.g., gardening for adults and playing in wet soil for children) rather than default values. These values are more representative and, in most cases, more protective.*
- *For evaluating exposures from fugitive dust, a particulate emission factor (PEF) of $1.32E+09 m^3/kg$ was used. However, the use of this PEF has not been justified in the risk evaluation. Revise the risk evaluation to discuss the appropriateness of using a PEF of $1.32E+09 m^3/kg$ to calculate chronic daily intakes (CDIs). Note that EPA's current default PEF for use in residential and generic industrial settings is $1.36E+09 m^3/kg$.*
- *See the previous general comment regarding the inclusion of additional inorganics in the calculation of risk and hazard (e.g., vanadium in soil and arsenic in groundwater). Revise Appendix C accordingly.*

Navy Response to TechLaw General Comment 6:

The Draft Corrective Measures Study Final Report will be revised to include a table in Appendix C containing all relevant toxicity factors used to calculate risk and hazard for arsenic exposures. Note that the toxicity values used in the preliminary risk calculations were the most current values. However, the soil adherence factors for the adult and child residents and the PEF used in the preliminary risk calculations will not be revised. As noted in the response to Comment No. 5, the preliminary risk calculations for arsenic included in this Draft Corrective Measures Study Final Report were conducted as part of the EPA-approved Revised Final Phase I RCRA Facility Investigation Report for SWMU 68 (approved by the EPA in a letter dated August 11, 2008). It follows that all exposure parameters used the calculations were approved at that time. However, as agreed upon in the January 9, 2009 conference call

between the Navy, EPA, and PREQB, EPA's current default PEF of 1.36E+09 m³/kg will be used in future human health risk assessments conducted for NAPR. Also, as noted in the response to Comment No. 5, the Draft CMS will not be revised to include evaluation of additional chemicals and/or media because the COPC selection methodology used in the preliminary risk calculations was approved with the Revised Final Phase I RCRA Facility Investigation Report.

7. *Include, in addition to total soil, a risk and hazard calculation for exposure to surface soil only (e.g., 0-1 foot below ground surface [bgs]) for future residents. This is the depth of soil residents would be expected to encounter. While it may not significantly impact the conclusions of the Draft CMS Report (e.g., CAOs), it should be included for accuracy and completeness. Alternatively, if a risk and hazard calculation for exposure to surface soil is not conducted and included in the revised version of the CMS Report, provide multiple lines of evidence supporting the use of total soils for the evaluation of residential exposures. For example, it should be demonstrated that the exposure point concentrations (EPCs) for total soil (0-10 ft bgs) do not differ significantly from those based on surface soil (0-1 ft bgs) (i.e., demonstrate risk and hazard results would not differ from those reported in the Draft CMS Report if EPCs were based on surface soil). Further support could be provided if it can be demonstrated that the establishment of a residential population at the site would require disturbing the soil, resulting in a redistribution of subsurface contamination. Revise the Draft CMS Report to address this issue.*

Navy Response to TechLaw General Comment 7:

The Corrective Measures Study Final Report will not be revised to include a risk and hazard calculation for exposure to surface soil only (0-1 foot bgs) for future residents because it would not significantly impact the conclusions of the Corrective Measures Study Final Report. However, Section 3.1.1 of the report will be revised to include rationale supporting the use of total soils for the evaluation of residential exposures. The following text will be added to the Draft Corrective Measures Study Final Report to demonstrate that the evaluation of total soil exposure only is appropriate and sufficient:

“Residential exposure to total soil was selected for the preliminary risk calculations to present a complete soil exposure scenario. This is because the hypothetical development of this SWMU for residential use would require disturbing the soil, which would result in the incorporation of subsurface contamination into the surface interval. However, in order to ensure that potential risks would not be underestimated from evaluating only total soil, 95% UCL values were calculated for arsenic concentrations found in both surface soil (0-1 bgs) and total soil (0-10 bgs). USEPA ProUCL Version 4.00.02 software (USEPA, 2007a and 2007b) was used to determine the distributions of the data sets and calculate the 95% UCL values that would be used as EPCs. The distributions for both data sets were determined to be non-parametric. The 95% UCL calculated for arsenic in surface soil was 1.55 mg/kg, while the 95% UCL calculated for total soil was 1.78 mg/kg. These values do not differ significantly from each other. Consequently, the risk and hazard results resulting from surface soil exposure evaluation would not differ significantly from those of total soil. These results are presented in Appendix C.”

TECHLAW SPECIFIC COMMENTS

1. *Table 3-2 Corrective Action Objectives for Copper, Lead, and Zinc in Surface Soil: Table 3-2 indicates that a CAO for the American robin is not calculated for Copper (Cu) or Zinc (Zn). The stated reason is that Cu and Zn do not present an unacceptable risk to terrestrial avian omnivore populations. This observation is insufficient evidence for not deriving CAOs. Note that the EPA has derived Ecological Soil Screening Levels (Eco SSLs) for both Cu and Zn. Calculate a CAO for Cu and Zn and amend Table 3-2 accordingly.*

Navy Response to TechLaw Specific Comment 1:

The EPA-approved Revised Final Phase I RCRA Facility Investigation Report for SWMU 68 (approved by the EPA in a letter dated August 11, 2008) included an evaluation of potential exposures to upper trophic level avian receptors (omnivore, herbivore, and carnivore). The results of the ecological evaluation indicated that copper and zinc do not present unacceptable risks to upper trophic level avian receptors (i.e., modeled dietary intakes are less than ingestion-based screening values). For this reason, the Draft Corrective Measures Study Final Report, including Table 3-2, does not include copper and zinc CAOs for avian receptors. In summary, based on the results of the ecological evaluation presented in the Revised Final RFI Report, the Navy does not believe Table 3-2 requires revision to include CAOs for a terrestrial avian receptor.

2. **Table 3-2 Corrective Action Objectives for Copper, Lead, and Zinc in Surface Soil, footnote (3) and (4):** Footnote (3) refers to the CAO for terrestrial invertebrates and plants for lead (Pb). The Pb CAO (120 mg/kg) refers to plants in the referenced EPA Eco SSL (OSWER Directive 9285.7-70), even though the footnote states that this value is an Eco SSL for terrestrial invertebrates. The CAO for Zn (120 mg/kg) refers to soil invertebrates in the referenced EPA Eco SSL (OSWER Directive 9285.7-73); even though footnote (4) states that this value is an Eco SSL for plants. Correct footnotes (3) and (4) to reference the correct receptor group.

Navy Response to TechLaw Specific Comment 2:

Footnote (3) in Table 3-2 will be revised to indicate that the lead CAO for terrestrial plants and invertebrates (120 mg/kg) is an Ecological Soil Screening Level (Eco SSL) for terrestrial plants. In addition, Footnote (4) will be revised to indicate that the zinc CAO for terrestrial plants and invertebrates (120 mg/kg) is an Eco SSL for terrestrial invertebrates.

3. **Section 3.1.4 Extent of Surface Soil Contamination, Page 3-4:** *The depth of contamination requiring mitigation at each of the contaminated sites is limited to the top one foot of soil because adverse ecological impacts are not expected to occur below that depth. Plants in dry climates can grow long tap roots in search of water which can extend well beyond one foot in depth. This adaptation could expose plants to possible soil contamination that has not been removed. Confirm that the northeastern corner of Puerto Rico gets enough annual rain fall to not be considered a dry climate, unlike certain regions along the southern coast of the island.*

Navy Response to TechLaw Specific Comment 3:

A review of the soil analytical data presented within Appendix A (Phase II ECP analytical data) and Appendix B (November 2006 Phase I RFI field investigation) shows that copper, lead, and zinc were not detected in subsurface soil at concentrations greater than the soil screening values (Eco SSLs) and/or NAPR background concentrations (upper limit of the mean concentration for clay soils) (see embedded table below). The maximum lead concentration also is less than the ecological CAO developed for avian omnivores (see Table 3-2 of the report). However, given that subsurface soil samples collected during previous field investigations were taken at depths greater than 2.0 feet below ground surface, the Draft Corrective Measures Study Final Report will be revised to indicate an excavation depth of 2.0 feet. The Navy does not believe an excavation depth greater than 2.0 feet is necessary based on available analytical data.

Chemical	Maximum Concentration (mg/kg)	Soil Screening Value (mg/kg)	Background concentration (mg/kg)
Copper	66	70	246
Lead	4.9	120	6.3
Zinc	75J	120	88

4. **Section 5.1.1, Required Planning Documents, Page 5-2:** Section 5.1.1 indicates that the Site-Specific Field Sampling and Analysis Plan (FSAP) (part of a Corrective Action Project Plan) will provide laboratory information, sample handling and analysis requirements, and quality assurance/quality control (QA/QC) requirements. Typically, this information is documented in a stand-alone, site-specific or project-specific quality assurance project plan (QAPP). Revise the Draft CMS Report to indicate whether a QAPP will be prepared for the proposed corrective measures. If not, explain how the QA/QC requirements for the corrective measures implementation project will be documented.

Navy Response to TechLaw Specific Comment 4:

The Navy has implemented previous investigations at NAPR in accordance with the EPA approved Master Project Management Plan (PMP), Master Data Collection Quality Assurance Plan (DCQAP), Data Management Plan (DMP), and Master Health and Safety Plan (HSAP) for NAPR. These Master Plans define acceptable data requirements and error levels associated with the field and analytical portions of this investigation. Section 5.1.1 will be revised to indicate that QA/QC requirements for corrective measures implementation are documented within these EPA-approved plans.

PREQB COMMENTS

(PREQB comments are provided in italics, while Navy responses are provided in regular print)

I. INTRODUCTION

This evaluation is of the Draft Corrective Measures Study Final Report, SWMU 68, Naval Activity Puerto Rico. The Collective Measures Study (CMS) Report presents the results of the CMS investigation conducted for Solid Waste Management Unit (SWMU) 68 (Former Southern Fire Training Area) at Naval Activity Puerto Rico (NAPR). The report also presents an evaluation of collective measures to mitigate potential human health and ecological risks.

The stated purpose of the report is to complete the characterization of SWMU 68 by presenting the environmental data, evaluate human and ecological risks, develop contaminants of concern (COCs) and collective action objectives (CAOs), and develop collective measures to mitigate any identified risks.

Please note that our review of ecological issues related to the proposed removal action excluded an evaluation of the exposure assumptions and parameters used to calculate the ecological CAOs, since those were decided previously during the screening ecological risk assessment (SERA) and Step 3a of the baseline ecological risk assessment (BERA).

Navy General Response to PREQB Comments:

EPA has determined that a “Streamlined CMS” is required to define the proposed remedy for the surface soils at SWMU 68 (see EPA letter dated August 11, 2008). The “Streamlined CMS” for SWMU 68 was prepared in accordance with Attachment IV of the Administrative Order on Consent (USEPA, 2007) and the Proposed Corrective Action Rule set forth in the May 1, 1996 Federal Register (Vol. 61, No. 85). Many of the PREQB comments are requesting information that pertains specifically to the Corrective Measure Implementation (CMI). This information will be provided in documents associated with the CMI (e.g., CMI Design and Corrective Action Project Plan).

II. GENERAL COMMENTS

1. *The CMS has not described the habitats and plant community types being remediated as a basis for guiding the design of a soil replacement and habitat restoration plan to assure that the existing vegetative cover will be replaced in kind. Please describe the wetland and upland habitats of the removal area in sufficient detail to provide a basis for subsequent habitat restoration design.*

Navy Response to PREQB General Comment 1:

Please see the Navy Responses to Page-Specific Comment Nos. 1 and 2.

2. *Jurisdictional wetland boundaries should be delineated in the field prior to the installation of erosion controls and soil removal action to assure that wetlands are fully protected by erosion controls and any wetland habitats being remediated will be restored to their original soil conditions, hydrology, and floristic composition.*

Navy Response to PREQB General Comment 1:

Please see the Navy Response to Page-Specific Comment No. 1.

3. *Since the CMS for the adjacent SWMU 69 acknowledged that local forested habitats may be used by the federally-endangered yellow shouldered blackbird, the habitat restoration for SWMU 68 should assure that the potential value of this area to protected species and other wildlife will be preserved or enhanced.*

Navy Response to PREQB General Comment 1:

Habitat restoration is not a component of the CMS and is, therefore, not addressed by the Draft Corrective Measures Study Report Final Report. Information relevant to habitat restoration will be provided in documents specifically associated with the CMI. It is noted that SWMU 68 (as well as SWMU 69) does not contain critical habitat for the yellow-shouldered blackbird. The potential for yellow-shouldered blackbirds to forage at SWMU 68 is based solely on their arboreal feeding behavior and the absolute presence of trees.

4. *The forth row that included disruption of Adjacent Facilities should be updated, since it stated that the Ofstie Field is currently closed and non-operational.*

Navy Response to PREQB General Comment 1:

Table 5-1 has been revised to indicate that Ofstie field is currently operating as a regional airport. It is noted that at the time of document submittal to the EPA, the information contained within Table 5-1 was accurate (i.e., Ofstie Field was non-operational).

III. PAGE-SPECIFIC COMMENTS

1. *Page 2-2, Section 2.2 SWMU 68 Description and History.* The aerial photograph in Figure 2-3 indicates that SWMU 68 consists of forested or shrub-dominated areas and non-forested habitats lacking shrubs. Several areas within the PEMI (palustrine emergent marsh) boundary shown in the aerial images of Figures 2-5, 2-6, 2-7, 3-1, 3-2 and 5-1 also appear to be shrub dominated or forested areas, rather than emergent marsh. Please discuss if the PEMI wetland boundary shown on the aerial photographs is a field-delineated jurisdictional boundary or is based on remote mapping of wetlands (e.g., NWI maps). If wetland boundaries have not been field-delineated, such delineation should precede the soil removal.

Navy Response to PREQB Specific Comment 1:

The wetlands depicted on Figures 2-5, 2-6, 2-7, 3-1, 3-2, and 5-1 were delineated by Geo-Marine, Inc. in December 1999 from 1993 color infrared and 1998 true color aerial photography. As such, the PEMI wetland boundary depicted on these figures does not represent a field delineated jurisdictional boundary. The Draft Corrective Measures Study Final Report will be revised to acknowledge that wetland boundaries within SMWU 68 will be field-delineated prior to implementation of soil removal activities. Delineation activities will be conducted in accordance with the 1987 Corps of Engineers wetland delineation manual (United States Army Corps of Engineers [USACE], 1987). Specific procedures for field delineation activities, as well as the results of the field delineation will be provided as part of the CMI.

2. *Page 2-2, Section 2.3, paragraph 2.* The brief description of depressed areas containing unspecified vines and other areas of dense grass at SWMU 68 do not provide a sufficient basis for documenting whether the removal areas are jurisdictional wetlands, upland habitats, or isolated wetland depressions surrounded by terrestrial grass communities. The color and texture of the aerial photographs suggest that the soil removal areas include both forested (14E-01) and non-forested (14E-03) habitats. Please describe the habitats to be disturbed by the soil removal action in greater detail, including a discussion of soil properties and a list of dominant trees, shrubs and herbaceous plants in the affected area. Also, the reference provided in the text (NAVFAC, 2004) was not provided in the References Section 24. Either include the reference in Section 2 4 or update the text to include the Correct reference

Navy Response to PREQB Specific Comment 2:

As discussed in the Navy Response to Page-Specific Comment No. 1, wetland boundaries within SWMU 68 will be field-delineated prior to implementation of soil removal activities. Field activities will include identification of dominant tree, shrub, and herbaceous plants in areas that will be impacted by soil removal activities. The Draft Corrective Measures Study Final Report will be revised to acknowledge that upland and wetland habitats at SWMU 68 (especially habitats within and contiguous to the soil removal action) will be described, including identification of dominant tree, shrub, and herbaceous plants in areas that will be impacted by soil removal activities. However, results will be presented in documents generated as part of the CMI process.

The date of the reference cited in Section 2.3 and identified above (i.e., NAVFAC, 2004) will be revised to 2005.

- 3. Page 2-2, Section 2.3, paragraph 3. The text should be revised to clarify what media (soil or groundwater) were screened with the FID to support the statement that the levels did not indicate potential impact to groundwater. Also, the description of groundwater sample collection should indicate the collection depth below static water level. Fire training areas at other military runways display petroleum and solvent contamination, resulting in LNAPL and/or DNAPL plumes. It is unclear whether deep groundwater was investigated. The description of subsurface geology, paragraph 3 of page 2-4, suggests the "tight clay formations" may have acted as an aquiclude to downward migration of contaminants.*

Navy Response to PREQB Specific Comment 3:

The text in Section 2.3 will be revised to clarify that soil were screened with the FID. Specific procedures used for groundwater sampling activities were previously presented within the EPA-approved Revised Final Phase I RFI Report for SWMU 68.

- 4. SWMU 69 was identified on Figure 2-2 as SWMU 68, please revise and correct.*

Navy Response to PREQB Specific Comment 4:

Figure 2-2 will be revised to show the correct identification for SWMU 69.

- 5. Page 3-1, Section 3.1.1, paragraph 1. A commercial/industrial worker exposure scenario should also be evaluated using only the surface soil dataset (down to 2 feet below ground surface). Although a residential exposure scenario uses more conservative exposure parameters than a commercial/industrial exposure scenario, the use of a total soil dataset comprised of surface and subsurface soil sample data down to 10 feet may underestimate actual exposure by commercial/industrial workers to surface soil. Corrective action objectives (CAOs) for the commercial/industrial worker should be developed, if necessary based on the results of the risk evaluation.*

Navy Response to PREQB Specific Comment 5:

Comment noted. However, the Draft Corrective Measures Study Final Report will not be revised to include evaluation of a commercial/industrial worker. As noted, a residential exposure scenario was used to represent the upper bound of potential risks, and there were no unacceptable risks or hazards identified. However, in order to ensure that potential risks would not be underestimated from evaluating only total soil, 95% UCL values were calculated for arsenic concentrations found in both surface soil (0-1 bgs) and total soil (0-10 bgs). USEPA ProUCL Version 4.00.02 software (USEPA, 2007) was used to determine the distributions of the data sets and calculate the 95% UCL values that would be used as EPCs. The distributions for both data sets were determined to be non-parametric. The 95% UCL calculated for arsenic in surface soil was 1.55 mg/kg, while the 95% UCL calculated for total soil was 1.78 mg/kg. These values do not differ significantly from each other. Consequently, the risk and hazard results resulting from surface soil exposure evaluation would not differ significantly from those of total soil, and it can be inferred that there would be no unacceptable risks or hazards calculated for the commercial/industrial worker. Therefore, development of CAOs for the commercial/industrial worker is not necessary.

6. *Page 3-5, Section 3.2.2, CAO Development for Ecological Receptors. Please expand the discussion to support the assumption that "Subsurface soil (greater than one foot below the ground surface) represents an incomplete exposure pathway for ecological receptors." This exposure assumption should be based on site-specific data that demonstrate a lack of potential habitat for soil invertebrates and burrowing animals, such as land crabs that are known to burrow much deeper than 2 feet bgs in Puerto Rico. If the biologically active zone extends from 0 to 2 feet bgs (e.g., land crab burrows), the ecological CAOs also should be applied to subsurface soils to the depth to which fauna are likely to burrow at the site.*

Navy Response to PREQB Specific Comment 6:

A review of the soil analytical data presented within Appendix A (Phase II ECP analytical data) and Appendix B (November 2006 Phase I RFI field investigation) indicates that copper, lead, and zinc are not present in subsurface soil at concentrations greater than CAOs. However, given that subsurface soil samples collected during previous field investigations were taken at depths greater than 2.0 feet, the Draft Corrective Measures Study Final Report will be revised to indicate an excavation depth of 2 feet. The Navy does not believe an excavation depth greater than 2.0 feet is necessary based on available analytical data. It is noted that land crabs have not been observed at SWMU 68 during previous field investigations.

7. *Page 4-2, Section 4.1.1, last paragraph. It is stated that no long term monitoring will be needed following the surface soil excavation and removal. However; some monitoring should be conducted to document the successful stabilization of the replacement soils and restoration of a native plant community in the soil removal areas, especially if they contain jurisdictional wetland habitats.*

Navy Response to PREQB Specific Comment 7:

The long-term monitoring discussed in Section 4.1.1 pertains to chemical monitoring. This section will be revised to indicate that some monitoring to ensure stabilization of soils and restoration of a native plant community will be conducted. A plan for monitoring replacement soils and restoration of a native plant community will be identified as part of the Corrective Measure Implementation.

8. *On the last paragraph of Section 4.1.1 at page 4-2 and on the second paragraph of Section 5.1 at page 5-1 the document informed, "Since the limits of the excavation will extend to a "clean" sample location, it is anticipated that the need for post -excavation confirmatory sampling is minimal". Such a statement creates the impression that minimal confirmatory sampling points will be identified as part of the Corrective Measures Implementation Design. Then, on the last paragraph of page 5-1, it is stated that: "Because the excavation will extend to "clean" sample locations post-excavation confirmatory sampling will not be required." EQB does recommend to take a minimal amount of confirmatory samples when the preferred remedial action is excavation and off-site disposal of soils. In order to clearly state the success of the remedial action the Navy should propose some confirmatory sampling points that support a later "no further action" at the SWMU.*

Navy Response to PREQB Specific Comment 8:

The Draft Corrective Measures Study Final Report will be revised to acknowledge that confirmation samples will be collected from the side walls and bottom of each excavation to confirm contamination has been removed. However, specific details of the confirmation sampling program will be provided in documents generated as part of the CMI process (e.g., Corrective Action Project Plan).

9. *Page 5-1, Section 5.1. Please include post-excavation confirmatory sampling to document conditions following remedial action.*

Navy Response to PREQB Specific Comment 9:

As discussed in the Navy Response to Page-Specific Comment No. 8 above, the Draft Corrective Measures Study Final Report will be revised to acknowledge that confirmation samples will be collected from the side walls and bottom of each excavation.

10. *Page 5-1, Section 5.1 Conceptual Design, 4th paragraph, 3rd and 10th bullets. Erosion controls and limits of work barriers/fences should be installed upgradient of field-delineated jurisdictional wetland boundaries and no equipment should be allowed to enter any wetlands from which contaminated soil or debris is not being removed. Excavated areas should not be backfilled with "clean fill" but should be backfilled with clean topsoil that has been prepared to reproduce the original soil properties of the site, at a minimum, by matching the original soil texture, pH, organic matter content and macronutrient profile (N, P, K).*

Navy Response to PREQB Specific Comment 10:

The Navy agrees that erosion controls should be installed upgradient of field-delineated jurisdictional wetlands and no equipment should be allowed to enter any wetlands from which contaminated soil is not being removed. The technical specifications, included as part of the CMI design, will provide the necessary details for backfilling the excavated areas, including the material used as backfill.

11. *Page 5-2, Section 5.1.1 Required Planning Documents. Please specify that a habitat restoration plan shall be included in the Corrective Action Project Plan. The restoration plan should include sufficient detail, based on site-specific ecological features, to guide the preparation of revegetation plans at the 100% Design stage. The habitat restoration plan should prescribe restoration of the original hydrology (e.g., depth to ground water) and in-kind replacement of the original topsoil and native plant communities, including species, seeding rates, and soil amendments. Soil amendments should be made to reproduce the original soil texture, pH, Organic matter, and nutrient profile of the soils being removed.*

Navy Response to PREQB Specific Comment 11:

Section 5.1.1 will be revised to indicate that the Corrective Action Project Plan will include information for habitat restoration.

12. *Table 5-2. The following issues were noted with respect to the cost estimate summarized in Table 5-2.*
- *An expansion factor should be included in the volume of soil to be excavated as this soil volume will increase as the soil is removed from its current, more compact state. The resulting volume increase will need to be carried through other line items, such as for transportation and disposal.*

Navy Response to PREQB Specific Comment 12:

As evidenced by Table 5-2, the volume of backfill takes into consideration an expansion factor of 20 percent. For costing purposes, an expansion factor is not necessary for transportation and disposal as unit prices and item prices for these activities are based on the weight of soil (i.e., tons), not volume of soil.

- Page 4-2 of the CMS states the combined lateral extent of the areas to be disturbed is approximately 7,500 SF (5,000 SF + 2,500 SF). This should be reflected in the line item cost for vegetative cover in Table 5-2

Navy Response to PREQB Specific Comment 12:

The quantity for vegetative cover in Table 5-2 is incorrect. The table will be revised to indicate 7,500 square feet for vegetative cover.

- 13. *Figure 5-1. To the extent practical, the location of the Equipment Laydown/Decon and Rolloff Staging Area should be moved such that these activities will not be performed within the wetland area. It would appear more beneficial to locate this area closer to the road than what is currently shown in Figure 5-1*

Navy Response to PREQB Specific Comment 13:

Figure 5-1 will be revised to show that the Equipment Laydown and Roll off Staging Area will not be located within the wetland area.

- 14. *Appendix A, Phase II ECP Analytical Data. The data presented in this section were not validated. This is obvious as to the presence of "B" and "*" qualifiers for metals analyses. Please comment on the use of invalidated data for this corrective measures study.*

Navy Response to PREQB Specific Comment 14:

The Phase II ECP analytical data were not subjected to data validation activities. The analytical data were used in the "Streamlined CMS" because maximum copper, lead, and zinc concentrations were detected in the Phase II ECP surface soil samples. Although the Phase II ECP analytical data were not validated, the Navy does not believe that their use in the "Streamlined CMS" compromises the integrity of the removal action since the limits of excavation are defined by analytical data subjected to third party validation.

- 15. *Appendix C, Table C-2. Please confirm that a dermal absorption fraction (ABS_d) of 0.03 (not 0.03%) and a gastrointestinal absorption factor (GIABS) of 1 were used in calculating dermal absorption associated with exposed to arsenic in soil. Please revise the footnote to accurately reflect the default ABS_d values used and indicate what GIABS value and toxicity criteria were used to calculate risk for arsenic in soil. Also, the EPA Regional Screening Level (RSL) table should be used as the reference for ABS and gastrointestinal absorption factors rather than EPA Region III. Note that it is the most up-to-date reference for toxicity criteria as well. Please revise the particulate emission factor to reflect the most recent EPA-recommended default value of 1.4×10^{-9} m³/kg, as presented in the RSL table dated September 2008. Note that these changes are unlikely to alter the conclusions of the risk evaluation for arsenic; however, these changes should be implemented for accuracy and to ensure consistency with current EPA Region 2 policy.*

Navy Response to PREQB Specific Comment 15:

The Draft Corrective Measures Study Final Report will be revised to include a table in Appendix C containing all relevant toxicity factors used to calculate risk and hazard for arsenic exposures. Note that

the toxicity values used in the preliminary risk calculations were the most current values. Appendix C will also be revised to eliminate references to EPA Region III. However, the PEF used in the preliminary risk calculations will not be revised. The Preliminary Human Health Risk Calculations for Arsenic included in this Draft Corrective Measures Study Final Report were conducted as part of the EPA-approved Revised Final Phase I RCRA Facility Investigation Report for SWMU 68 (approved by the EPA in a letter dated August 11, 2008). It follows that all exposure parameters used the calculations were approved at that time. However, as agreed upon in the January 9, 2009 conference call between the Navy, EPA, and PREQB, EPA's current default PEF of $1.36E+09 \text{ m}^3/\text{kg}$ will be used in future human health risk assessments conducted for NAPR.

16. *Figure 2-7. The text box which provides the concentration of arsenic at 3.6 mg/kg is pointing to the incorrect sample location (68SS04). This text box is associated with boring location 68SB04. Please update the figure accordingly.*

Navy Response to PREQB Specific Comment 16:

Figure 2-7 will be revised to show the arsenic concentration of 3.6 mg/kg is associated with soil boring location 68SB04.