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U S NAVY RESPONSES TO U S EPA REGION II COMMENTS ON THE DRAFT STEPS 6  
AND 7 OF THE BASELINE ECOLOGICAL RISK ASSESSMENT FOR SOLID WASTE  
MANAGEMENT UNIT 2 NAVAL ACTIVITY PUERTO RICO

1/28/2000  
CH2M HILL

1140003-00125

**NAVY RESPONSES TO EPA COMMENTS DATED JANUARY 28, 2010**

**EPA REVIEW OF THE OF THE DRAFT STEPS 6 AND 7 OF THE BASELINE ECOLOGICAL  
RISK ASSESSMENT FOR SWMU 2 DATED DECEMBER 4, 2009**

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

**GENERAL COMMENTS**

1. *The executive summary presents a thorough overview of the Draft BERA. It was noted, however, that this section does not mention amphibians or reptiles even though these two receptor groups were retained in the Draft BERA. The text on Page 2-24 states that risk to amphibians and reptiles would be inferred from risk to upper trophic level terrestrial receptors. Revise the report to provide a discussion of these two receptor groups in the executive summary, and elsewhere in the text, as appropriate, in order to provide a complete evaluation.*

**Navy Response:** The executive summary and the text throughout the document will be revised, as deemed appropriate, to include a discussion of terrestrial reptiles and amphibians. Section 7.0 also will be revised to include a discussion of the uncertainty associated with inferred risks to terrestrial amphibian and reptiles based on risks to terrestrial avian omnivores.

2. *Section 7 (uncertainty analysis) discusses several uncertainties associated with the analytical data, the selection of reference sites, the lines of evidence, and the ecological receptors. Several other uncertainties should also be considered, such as using generic soil and sediment benchmarks to calculate hazard quotients; the applicability of the wildlife toxicity reference values; or the impact of using site-specific tissue residue data on the food chain modeling results. A comprehensive uncertainty analysis provides valuable information for use in risk management decision making. Revise the report to address these concerns.*

**Navy Response:** Section 7.0 will be revised to include a discussion of several uncertainties related to media-specific screening values, ingestion-based screening values, co-located chemicals, and receptor species.

3. *The "Terrestrial Invertebrate Community" line of evidence is thorough and provides supporting evidence for the risk characterization. Other lines of evidence, such as those collected for the "Terrestrial Avian Omnivore Populations" include an assessment of reference area risk contribution. It is recommended that the same reference area contribution be applied to the terrestrial invertebrate community assessment to assist with the risk conclusions on contaminant effects (versus reference concentration effects). Revise the report to include this approach to the assessment.*

**Navy Response:** Section 4.2.1 will be revised to include a discussion of risk estimates (i.e., hazard quotient values) for terrestrial invertebrate exposures to ecological COCs in Upland Reference Area No. 2 soil. An evaluation of the contribution that chemical concentrations at the reference area have to the total risk at SWMU 2 also will be provided. In addition to these revisions, a new table summarizing available soil analytical data for Reference Area No. 2 and hazard quotient values based on maximum, 95 percent UCL of the mean, and arithmetic mean reference area soil concentrations will be prepared and referenced within this section. Appendix G will be revised to include output pages from the software (ProUCL Version 4.00.04 software) used to calculate 95 percent UCL of the mean reference area concentrations. Finally, Sections 5.1.1 and 6.1.1 will be revised to include a summary of reference area risk calculations and SWMU 2 and reference area risk estimates.

4. *The Draft BERA relies on several lines of evidence derived from tissue residue analysis of fiddler crabs, turtle grass, and earthworms. It appears that the only Quality Assurance (QA) samples collected for these media consisted of laboratory-grade deionized water bottle blanks (refer to Section 3.3, Quality Assurance/Quality Control Sampling, and Table 3-7 as an example). Tissue analysis results can create matrix interference error that can only be checked by using certified standard matrix spike and/or matrix spike duplicate (MS/MSD) samples. Revise the report to describe if certified QA tissue samples were included in the chemical analyses, or describe any uncertainty associated with matrix interference to the analysis results.*

**Navy Response:** The analytical program did not include Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples for earthworm, fiddler crab, and seagrass tissue. The text in Section 7.0 will be revised to include a discussion of the uncertainty associated with the lack of MS/MSD tissue samples.

## **SPECIFIC COMMENTS**

5. *Section 1.0, Introduction, Page 1-1 (and others): The document title indicates that the Draft BERA contains information pertinent to Steps 6 and 7 of the ecological risk assessment process, whereas in reality, the document also encompasses Step 5 (field verification). The title and all title references should be edited to include reference to Step 5.*

**Navy Response:** The document title will be revised to include a reference to Step 5 of the ERA process.

6. *Section 2.2.1, Terrestrial Habitats, Page 2-2: The discussion in this section should refer to the findings from the Vegetation Community Description and Plant Community Health documentation provided on Pages 14 and 15 of Appendix A. Section 2.2.1 should be revised to include a reference to this work since it describes the species observed from the on-site studies conducted and documented. Revise the document to include this information.*

**Navy Response:** Text will be added to Section 2.2.1 indicating that a description of the vegetative community at SWMU 2, including a list of the specific vegetative species observed within the upland coastal forest community and a qualitative evaluation of plant community health, is included within the habitat characterization report included as Appendix A. The text will specify the specific pages within the habitat characterization report where this information can be found.

7. *Table 2-2, Screening-Level Assessment Endpoints, Risk Questions, and Measurement Endpoints: As stated in General Comment 1 above, it is difficult to follow the fate of amphibian and reptile receptors in this document. As stated in the third paragraph on Page 2-8, "amphibians and reptiles were qualitatively evaluated... for additional evaluation in Step 3b of the ERA process." For consistency, Table 2-2 should include a statement that these receptors were evaluated in Step 3b. The title of the table also incorrectly refers to SWMU 1 and should be revised to indicate SWMU 2. Revise the document to reflect these clarifications.*

**Navy Response:** Table 2-2 will be revised to eliminate reference to SWMU 1. However, the Navy does not believe it is necessary to revise this table to include a statement that these receptors were evaluated in Step 3b since this table only presents the assessment endpoints, risk questions, and measurement endpoints selected for evaluation in the screening-level ERA and Step 3a of the baseline ERA, not Step 3b of the baseline ERA. However, Table 2-4 will be revised to include terrestrial reptiles and amphibians and a list of associated ecological COCs. The assessment endpoints and risk questions listed in Section 2.4.3 and the measurement endpoints listed in Section 2.5.1 for the baseline ERA will be revised to

**Navy Response:** As discussed in the Navy's original response to Specific Comment No. 3 dated December 1, 2009, the food ingestion rate (FIR) for the American robin varies based on the percentage of invertebrates and plants in the total diet. The FIR can be weighted to reflect any assumed proportion of plants and invertebrates using the following formula:

$$FIR_{total} = \left[ \left( \frac{PD_{plants}}{PD_{plants} + PD_{worms}} \right) (0.59) \right] + \left[ \left( \frac{PD_{worms}}{PD_{worms} + PD_{plants}} \right) (0.31) \right]$$

where:

- $FIR_{total}$  = Food ingestion rate (g/g-day; wet weight basis)
- $PD_{plants}$  = Proportion of diet composed of plants (unitless)
- $PD_{worms}$  = Proportion of diet composed on earthworms (unitless)

In this equation, 0.59 represents the American robin FIR for a plant diet in g/g-day (wet weight), while 0.31 represents the American robin FIR for an invertebrate diet in g/g-day (weight weight) (Levey and Karasov, 1989). Because the assumed diet of the American robin used in the SWMU 1 BERA did not include plant material, a FIR of 0.31 g/g-day (wet weight) is calculated by the above formula. This FIR was converted to units of kg/day (wet weight) by multiplying the FIR by the body weight of the American robin (0.0773 kg). Finally, this wet weight value (0.02396 kg/day) was converted to a dry weight value by multiplying the value by the solids content of earthworms (0.16 [USEPA, 1993]). The solids content of earthworms was used in the conversion from wet weight to dry weight since this invertebrate represents the assumed prey item in the BERA. The methodology used to derive the American robin FIR will be added to the fourth bullet item under Section 2.5.4.