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MCRD PARRIS ISLAND  
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U S NAVY RESPONSES TO U S EPA REGION IV COMMENTS ON DRAFT FEASIBILITY  
STUDY/CORRECTIVE MEASURES STUDY FOR SITE 1 INCINERATOR LANDFILL AND SITE  
41 FORMER INCINERATOR MCRD PARRIS ISLAND SC  
1/11/2002  
NAVAL FACILITIES ENGINEERING COMMAND SOUTHERN DIVISION

**USEPA COMMENTS ON DRAFT FEASIBILITY STUDY/CORRECTIVE MEASURES STUDY  
SITE/SWMU 1 - INCINERATOR LANDFILL AND SWMU 41 FORMER INCINERATOR  
MARINE CORPS RECRUIT DEPOT PARRIS ISLAND, SOUTH CAROLINA  
EPA ID#: SC6170022767**

Specific Comments:

1. **Comment:** Page 1\_1, Section 1.2, 1st Paragraph, 1st and 2nd Sentences. The CERCLA/SARA regulatory framework is generally referred to being applicable to past releases of hazardous substances, in part to distinguish this program from RCRA requirements for hazardous waste. Please rephrase this text to clarify this distinction.

**Response:** Agreed. The phrase ..."past hazardous waste operations and past hazardous materials spills"... will be revised to ..."release of hazardous substances"....

2. **Comment:** Page 2\_2, Section 2.2, 1st Paragraph, 1st Sentence. Specify that the borings installed during the RI/RFI were around the perimeter of the site. This will help clarify the approximate depths on the cross\_sections.

**Response:** Agreed. The following will be added at the second sentence. " These wells and boring were installed around the perimeter of the site."

3. **Comment:** Page 2\_3, Section 2.2, 1st Paragraph, 3rd Sentence. Please clarify that the topographic low areas are the surrounding tidal creeks.

**Response:** Agreed. The sentence will be modified as follows. ... toward the topographical low areas "(surrounding tidal streams)"....

4. **Comment:** Page 2\_3, Section 2.2, 3rd Paragraph. Add a statement to this paragraph that the Floridian Aquifer generally flows toward the coast, and that there are no private or municipal groundwater wells between Site 1 and the coast.

**Response:** There is insufficient information on the properties of the Floridian Aquifer in this area to make this statement. The Master Work Plan for the site indicates that the Floridian Aquifer from this area may flow toward the southeast to southwest, but the flow direction may be influenced by a significant user to the south.

5. **Comment:** Page 3\_11, Section 3.2.3. Add the CERCLA Off Site Rule to the Action\_Specific ARARs for off site disposal of CERCLA waste.

**Response:** The following statement will be added to the first bullet on Page 3-12. "In addition, the offsite landfill must be in compliance with it's permit (CERCLA Offsite Rule)."

6. **Comment:** Pages 3\_19 through 3\_22, Section 3.4. The discussion presented for the media of concern is presented relative to implementation of a containment alternative. Selection of the appropriate response action has not taken place. The relative impact of the no action and removal alternatives should be presented for the media of concern as well, or the text revised not to discuss response actions. Pathways and interactions between media should be discussed further.

**Response:** The discussion of the presumptive remedy in this section is presented to clarify site characterization data that is or is not available and is included in response to previous team comments. The discussion does not presume that a response action has been selected. The discussion on the impact of the alternatives is presented in Section 5.0 of the report.

7. **Comment:** Page 3\_23, Section 3.5, 1st Paragraph, 1st Sentence. The rationale for not identifying COCs in surface water should be presented (e.g., none were present, a transient media that will be addressed through the sediment. response action, etc.).

**Response:** The following statement will be added. As discussed in Section 3.4, because of the transient nature and presence of only minor contamination, surface water and groundwater COCs will be addressed via soil and sediment actions.

8. **Comment:** Page 3\_23, Section 3.5.1, 2nd Paragraph. Please include/cite the reference used for TEFs. The same comment applies to the soil COCs.

**Response:** The following reference will be added to these two paragraphs.

U.S. EPA (United States Environmental Protection Agency). 1995. Supplemental Region 4 Guidance to RAGS: Human Health Risk Assessment. Atlanta, GA, November.

9. **Comment:** Pages 3\_24 and 3\_25, Section 3.5.2. Clarify whether references in the text to sediment exposure and sediment COCs are intended to refer to soil.

**Response:** Agreed. The two references to sediment will be changed to soil.

10. **Comment:** Page 3\_26, Section 3.7, 1st Paragraph, 1st Sentence. Present the rationale for selecting sediment and soil media for development of RGOs (i.e., the primary impacted media requiring a response action, and the response action is considered to be protective of pathway media as well).

**Response:** Agreed. The first sentence will be revised as follows. "As discussed in Section 3.4, RGO were selected to aid in assessing impacted soils and sediments. These two media are the most impacted at the site, and addressing these will address other potentially impacted media including surface water and groundwater."

11. **Comment:** Page 3\_26, Section 3.7, 2nd Paragraph, 3rd and 4th Sentences. Elaborate how HHRA risk drivers were identified and why these were the only COCs selected for RGOs. Also, clarify the process that may subsequently identify additional COCs. Generally, the COCs and related risks requiring action are established in the FS, and are not subject to further revision.

**Response:** Agreed. The second half of the 3rd sentence and the 4th sentence will be deleted. The COC presented are the final COCs.

12. **Comment:** Page 4\_2, Section 4.2.1, 1st Paragraph. To be consistent with subsequent sections, it should be stated that no action does not reduce the volume, mobility or toxicity of the contaminants and may eventually result in a larger area becoming contaminated through mass wasting processes.

**Response:** The following sentence will be added. "The no action alternative does not reduce toxicity, mobility, or volume. However, in the long term, contaminants may detoxify, become immobilized, migrate, and/or impact additional media in the future. Associated risks would be unknown."

13. **Comment:** Page 4\_2, Section 4.2.3, 1st Paragraph, 2nd Sentence. Tidal/wave action should be added to the list of primary transport mechanisms.

**Response:** Tidal/wave action is considered in the surface water and erosion mechanisms, but as requested will also be listed separately.

14. **Comment:** Page 4\_6, Section 4.5.1.2, 4th Paragraph. Discussion should be added regarding in perpetuity costs associated with this technology. Since Site 1 includes COCs with slow natural degradation rates, the necessary duration for implementing this technology is long. While it is recognized that present worth is the cost basis used for the FS, making costs beyond 30 years relatively insignificant, recent analysis by the General Accounting Office (<http://www.gpo.gov>) suggests these costs may be a significant consideration for the lead agency.

**Response:** This type of discussion is too detailed for this section of the FS, especially since the costs are only listed as low, medium, or high. Rather, this type of discussion will be added as a new uncertainty discussion presented under Section 6.2.9 and include the following.

“The cost estimates presented in this section are based on several assumptions and include the following.

The estimate for leaving waste on site assumes that operation and maintenance costs remain constant for 30 years. Actual costs may be higher or lower based on the results of the groundwater monitoring, effectiveness of the cap in containing wastes, and the long term degradation and/or stability of the contaminants present. In addition, MCRD Parris Island will be responsible for maintaining the integrity of the landfill beyond 30 years. Costs beyond 30 years are not factored into Feasibility Studies.

The cost estimate for off site disposal assumes that 1% of the waste materials will need to be segregated and treated prior to disposal. The actual percentage of waste requiring treatment prior to disposal may be higher or lower.

The cost estimate for off site disposal assumes that the MCRD Parris Island will have no future liability for wastes taken off site. In the event that the private offsite landfill is not able to maintain the integrity of the landfill, MCRD Parris Island may be required to again address these wastes, as well as potentially wastes disposed of by other generators.”

15. **Comment:** Page 4\_7, Section 4.5.1.3.1, 2nd Paragraph. The duration of the multilayer cap relative to the persistence of the COCs should be considered as part of the effectiveness evaluation.

**Response:** Reliable information on this concept is not available and as a result no changes are planned for the FS. The toxicity of most of the contaminants would be expected to dissipate with 20 to 200 years. The covered synthetic liners and clay are expected to be stable for longer periods of time. However, this issue is the same for all alternatives considered, including on site and off site landfills.

16. **Comment:** Page 4\_7, Section 4.5.1.3.1, 4th Paragraph. As stated in Specific Comment 14, additional discussion of the long\_term costs should be added.

**Response:** This type of discussion is too detailed for this section of the FS, especially since the costs are only listed as low, medium, or high. Rather, this type of discussion will be added as a new uncertainty discussion presented under Section 6.2.9.

17. **Comment:** Page 4\_8, Section 4.5.1.3.2, 1st Paragraph. The expected or required duration for containment requiring slope stabilization and erosion control measures should be presented. Based on this, a design storm event return period can be established. The necessary elevation and extent of erosion control measures can then be established.

**Response:** The necessary elevation and extent of erosion control measures will be developed in the Remedial Design. Site 1 is located within the 100 year flood plan, but is not identified in an area of "flood with velocity (wave action)". See page 2-23 of the Master Work Plan, Volume 1.

18. **Comment:** Page 4\_11, Section 4.5.1.4.2, 1st Paragraph. Add text stating that current off site facility approval for CERCLA waste disposal also is required.

**Response:** Agreed.

19. **Comment:** Page 4\_11, Section 4.5.1.4.2, 2nd through 4th Paragraphs. Additional specificity regarding the local availability of appropriate disposal facilities, the distance(s), and tipping fees should be included to fully evaluate the viability of this technology.

**Response:** The availability of local off site landfills is a cost issue and is addressed in more detail in Sections 5.0 and 6.0. For Section 4.0, and the type of cost evaluation presented, (i.e. low, medium, and high), this level of detail is not required. One local landfill (less than 50 miles) and several regional landfills (less than 500 miles) have been identified.

20. **Comment:** Page 4\_13, Section 4.5.2.2, 5th Paragraph. As noted in Specific Comment 14, additional discussion of the significance of long term\_costs should be added.

**Response:** For an FS, the cost issues are generally limited to 30 years. The cost for monitoring and maintenance beyond 30 years is uncertain, and when evaluated using a present worth consideration, relatively insignificant.

21. **Comment:** Page 4\_16, Section 4.5.2.5.1, 3rd Paragraph, 5th Sentence. Delete the word "Potentially" from this statement; land use controls would be required.

**Response:** Agreed.

22. **Comment:** Page 4\_17, Section 4.5.2.5.2, 2nd through 4th Paragraphs. See specific Comment 19.

**Response:** The availability of local off site landfills is a cost issue and is addressed in more detail in Sections 5.0 and 6.0. For Section 4.0, and the type of cost evaluation presented, (i.e. low, medium, and high), this level of detail is not required.

23. **Comment:** Page 4\_20, Section 4.7.2, 2nd Bullet. Reword this statement to clarify it is monitored natural attenuation, and that it also applies to Arsenic contaminated sediments.

**Response:** The statement will be reworded to indicate that the remedy is "monitored natural attenuation for PAHs".

Arsenic is not generally subject to natural attenuation processes, and monitoring is not being proposed for this area. The arsenic contaminated sediments were not found to present a current risk to human health or ecological receptors. The only identified concern with this area would be in the event that housing units were constructed in the marsh area and people lived in close contact with the sediment for long periods of time.

24. **Comment:** Page 5\_2, Section 5.1.2, 2nd Bullet. See Specific Comment [33].

**Response:** The statement will be reworded to indicate that the remedy is "monitored natural attenuation for PAHs".

Arsenic is not generally subject to natural attenuation processes, and monitoring is not being proposed for this area. The arsenic contaminated sediments were not found to present a current risk to human health or ecological receptors. The only identified concern with this area would be in the event that housing units were constructed in the marsh area and people lived in close contact with the sediment for long periods of time.

25. **Comment:** Page 5\_4, Section 5.1.2, 2nd Paragraph. Please specify that a monitoring plan will be submitted as part of the Remedial Action Report.

**Response:** The following sentence will be added to the paragraph. "Additional details would be developed during the remedial design and remedial action."

26. **Comment:** Page 5\_5, Section 5.1.2, 4th Paragraph, 2nd Sentence. Clarify what groundwater monitoring program is being referred to since this would be a pre\_construction decision.

**Response:** The decision would be a post construction decision, and based on the results of the groundwater monitoring program.

27. **Comment:** Page 5\_6, Section 5.1.2, 3rd Paragraph. As stated in Specific Comment 17, the design storm event should be established in order to determine the type and extent of slope stabilization and erosion control necessary.

**Response:** The design storm event is determined during the remedial design phase.

28. **Comment:** Page 5\_6, Section 5.1.2, 4th Paragraph. Please add text indicating that sinuous drainage ways will be included in the final grading plan for denuded sediment excavation areas.

**Response:** The type and number of drainage ways will be defined in the remedial design.

29. **Comment:** Page 5\_7, Section 5.1.2, 1st and 3rd Paragraphs. Clarify that the frequency for long\_term monitoring of groundwater and sediment is expected to be annual after the first year. Also, clarify the inspection and monitoring frequency anticipated for the landfill cap. It would be expected that inspections would be conducted following major storm events and quarterly for at least the first five years.

**Response:** The wording presented in the FS is intentionally vague. The monitoring and frequency requirements will be determined during preparation of the long term monitoring work

plan. The intent of the FS is to only provide general guidelines, and to present the basis for the cost estimate.

30. **Comment:** Pages 5\_10 through 5\_12, Section 5.1.3. Specific Comments 26 through 29 also are applicable to the corresponding elements of Alternative 2b.

**Response:** Acknowledged. Responses will be similarly incorporated.

31. **Comment:** Page 5\_14, Section 5.1.4, 4th Paragraph, 6th Sentence. It is recognized that including 10 percent hazardous waste in the disposal volume is a contingency planning measure, but this may be overly conservative. If this volume of hazardous waste were present, the RI would have had more indication of its presence. One percent may be more realistic since any potentially hazardous waste would likely be segregated prior to disposal. Changing this assumption would save approximately \$1,000,000 on the cost estimate for this alternative.

**Response:** The estimate provided is somewhat conservative based on limited characterization of the waste material at the site. The actual percentage of waste that would be classified as hazardous would only be determined during an excavation.

Although, as evidenced by the lack of significant groundwater contamination and the length of time that materials have been present and subject to weathering, it is likely that any excavated wastes excavated would not be classified as hazardous waste. As such, the estimate will be revised to reflect a 1% assumption for the percentage of hazardous waste. However, because of the uncertainty, the estimate assuming 10% hazardous waste will remain in the Appendix and also be referenced in footnote to the cost summary table. Please note that costs at offsite landfills vary significantly over time based on availability and regulatory requirements.

32. **Comment:** Page 5\_14, Section 5.1.4, 5th Paragraph. See Specific Comment 28 regarding the installation of sinuous drainage ways in the denuded excavation areas.

**Response:** The type and number of drainage ways will be defined in the remedial design.

33. **Comment:** Page 5\_18, Section 5.2.5.5, 1st Paragraph, 4th Sentence. Use of a 30\_year basis for calculation of present worth costs is an acceptable approach. In addition to this the FS should specify the design life of the containment system based on the expected duration of COC degradation to acceptable concentrations (i.e., 50 years versus 500 years). This information will

allow the lead agency to better evaluate real long\_term costs and restrictions of the containment alternatives.

**Response:** Acceptable concentrations in media are based on matrix, pathway, stability, toxicity, and dose. Because the wastes are isolated from the receptors, once the wastes are contained within the landfill, the waste constituents meet acceptable concentrations. Since the primary COCs are inorganic, they are not subject to degradation like the organics. However, inorganics may naturally stabilize to less toxic or bioavailable forms. However, the bioavailability of chemicals are not normally addressed in risk assessments. The current risk assessment assumes that the contaminants are 100% bioavailable.

Also, because the waste materials, as well as the cap design are relatively inert and stable (e.g mineral clays and rock), the landfill is expected to remain effective indefinitely. Although, the Navy acknowledges that maintenance of the landfill beyond 30 years may be required.

34. **Comment:** Page 5\_22, Section 5.3.2.1, 3rd Paragraph. Clarify that monitored natural attenuation also is the planned component of this alternative for sediment with Arsenic contamination above human health RGOs.

**Response:** The referenced alternative does not consider monitored natural attenuation of the arsenic. Insoluble arsenic, being a metal, is not normally considered subject to monitored natural attenuation. The arsenic contamination will be addressed through land use controls, that will prohibit residential development in the salt water marsh. Site specific human health risk calculations indicate that under current and future expected scenarios, adverse risk to human health is not present.

35. **Comment:** Page 5\_22, Section 5.3.2.2, 1st Paragraph, 2nd Sentence. Specify what the surface water exceedances are.

**Response:** Agreed. The following contaminants will be added to the referenced sentence.

“bis(2-ethylhexyl) phthalate, chrysene, pentachlorophenol, arsenic, copper, lead, mercury, and zinc”

36. **Comment:** Page 5\_22, Section 5.3.2.2, 1st Paragraph, 5th and 7th Sentences. Please clarify the expected timeframes over which the cleanup standards will be attained for each media (e.g., 5\_10 years, 10\_20 years, 20\_50 years, etc.).

**Response:** An accurate range for achieving these goals cannot be determined for these media, and as such was not presented. Once the wastes are isolated from the environment, continuing impact from them would end almost immediately, whereas chemical input from groundwater will likely continue for a few years. Also, further complicating this estimate would be the fact that these constituents are present in the surface water upstream of Parris Island and the quality of this water is not within control of the base.

37. **Comment:** Page 5\_23, Section 5.3.2.5, 1st Paragraph, 1st Sentence. As stated in Specific Comment 36, clarify how long before this alternative would be expected to be fully effective.

**Response:** An accurate range for achieving these goals cannot be determined for these media, and as such was not presented. Once the wastes are isolated from the environment, continuing impact from them would end almost immediately, whereas chemical input from groundwater will likely continue for a few years. Also, further complicating this estimate would be the fact that these constituents are present in the surface water upstream of Parris Island and the quality of this water is not within control of the base.

38. **Comment:** Page 5\_23, Section 5.3.2.5, 1st Paragraph, 3rd Sentence. Please add or may fail completely to the end of this sentence. Eventual failure is the design endpoint for all containment systems.

**Response:** The text will be added as indicated. However, please note that the containment system is being designed not to fail, and that long term maintenance will be required to continue the effectiveness of the cap.

39. **Comment:** Page 5\_23, Section 5.3.2.5, 2nd Paragraph. The extent of necessary repairs is highly dependent on the design life and the time necessary for the wastes to degrade to below action levels. The likelihood of a hurricane event producing a significant storm surge topped by heavy waves that could severely damage or destroy unprotected portions of the landfill, releasing COCs to the environment, increases with this duration. For this reason, periodic inspections should include after severe storms. This uncertainty should be reflected in either conservative design assumptions (e.g., rip rap up to the 100 year storm event) or more conservative O&M assumptions (e.g., major repairs required every 50 years) in the cost estimate.

**Response:** The need for inspection after storm events will be added to the report in several locations. The assumptions for the design of the rip rap will be addressed during the remedial

design. Cost assumptions beyond the 30 year period is not included in the FS estimates and even if it was, because of the factor used in estimating future costs, the estimate would have a negligible impact on the cost estimate. Note that Site 1 is outside the area identified as being subject to wave action during storm events.

40. **Comment:** Page 5\_25, Section 5.3.2.5, 6th Paragraph. The O&M costs appear to be somewhat underestimated. Based on an increased inspection frequency and a larger allowance for repair of storm damage, please provide a revised O&M cost estimate.

**Response:** The Navy will use existing base personnel for the inspection. Since this effort will be incremental for existing base personnel, added costs would be minimal.

Costs associated with potential storm damage are difficult to predict. The values presented are expected to be higher in some years and lower in other years. Also note that the landfill is being designed to minimize the need for long term maintenance, through vegetation, slope design, and erosion control measures.

41. **Comment:** Pages 5\_26 through 5\_29, Section 5.3.3. Specific Comments 36 through 40 also are applicable to the corresponding elements of Alternative 2b.

**Response:** Acknowledged. The responses will be incorporated as indicated.

42. **Comment:** Page 5\_30, Section 5.3.4.4, 1st Paragraph, 3rd Sentence. See Specific Comment 31.

**Response:** Acknowledged. The responses will be incorporated as indicated.

43. **Comment:** Page 5\_32, Section 5.3.4.5, 1st Paragraph. Based on a revised percentage of hazardous waste, please provide a revised cost estimate for the removal alternative.

**Response:** Agreed.

44. **Comment:** Page 6\_3, Section 6.2.5, 2nd Paragraph, 4th Sentence. The acceptability of alternative 2a will, in part, rely on the estimate of the time required to attain cleanup goals using monitored natural attenuation.

**Response:** Acknowledged.

45. **Comment:** Page 6\_4, Section 6.2.6, 1st Paragraph, 4th and 6th Sentences. The apparent discrepancy in waste volumes between alternatives 2b and 3 appears to be attributable to inclusion of a "buffer area outside waste limits" in alternative 3. It is unclear why this is included in the estimated excavation volume as it appears to be related to subitem 1.6 for clearing vegetation in a border area, presumably for equipment access, not to a contingency waste volume. Please clarify.

**Response:** The difference in volume estimates is based on the practical ability to excavate wastes and is commonly referred to "over excavation" to ensure that all waste materials are removed. Over excavation typically requires that one to two feet of additional vertical excavation be conducted to ensure that all of the waste has been removed and that the confirmatory samples are clean.

46. **Comment:** Page 6\_4, Section 6.2.7, 2nd Paragraph. It should be noted that implementation of alternative 3 would restore 5 to 7 acres salt marsh.

**Response:** Agreed. The following statement will be added. "Under Alternative, approximately 5 to 7 acres of salt water marsh will be added to the approximately 4000 acres of salt water marsh currently at MCRD Parris Island.

47. **Comment:** Page 6\_5, Section 6.2.9. The cost comparison should be based on the revised assumptions discussed above. Additionally, the position of the lead agency relative to the real long\_term costs for long term monitoring and O&M should be evaluated.

**Response:** The cost estimates will be revised as indicated above. The Navy, as the lead agency, assumes the burden for these costs.

48. **Comment:** Page 6\_7, Table 6\_1, 3rd column, 6th row. In the text of the FS monitored natural attenuation is presented as a treatment technology, and this should be reflected in the table.

**Response:** Agreed. "No treatment" will be replaced with "No enhanced treatment other than natural biological degradation.

48. **Comment:** Appendix B. The assumptions and engineering approach reflected in the cost estimates are internally consistent, thorough, and reasonable. Based on the revised assumptions presented in the comments above, it would be expected that the estimated costs for alternatives

2a and 2b would increase slightly and for alternative 3, decrease moderately. Despite these changes, the present worth cost for removal and off site disposal would still exceed the containment alternatives.

**Response:** Acknowledged.