6/28/04 - 02817

COMMONWEALTH OF PUERTO RICO
OFFICE OF THE GOVERNOR
ENVIRONMENTAL QUALITY BOARD

June 28, 2004

Mr. Christopher T. Penny
Remedial Project Manager
Naval Facilities Engineering Command
Atlantic Division, Code EV 23
1510 Gilbert Street
Norfolk, VA 23511-2699

Dear Mr. Penny:

The Puerto Rico Environmental Quality Board (EQB) submits to the U.S. Department of the Navy the comments contained herein regarding the work plan for the environmental investigations of the sites Area of Concern (AOC) I & AOC R on the West Side of the Vieques Island.

Enclosed are comments on the April 2004 "Draft Remedial Investigation/ Feasibility Study Work Plan For AOC I and AOC R" prepared by EQB and EPA.

It should be noted that:

1- During our last CERCLA Technical Team meeting (June 2004) some new information about the prior usage of one of the sites was said, this should be researched further and documented.
2- The term ditch is not consistent with the ecological characteristics of an intermittent stream. A better word should be used to describe the area.
3- The rationale behind the sampling points should be documented as well as the calculations made on the Risk Assessment.
4- It should be noted that in many of the documents one of the main arguments of EPA is that the reports follow EPA Region IV, this makes the task of reviewing for Region II more difficult. Keeping in mind the workload this should be corrected to expedite the review process.

If you have any questions or comments, do not hesitate to contact me at 787-365-8573.

Cordially,

Yarissa Martínez
Vieques and Culebra Affairs Coordinator
Cc/ Susan Silander, Fish & Wildlife Services
Daniel Rodriguez, CEPD

Enclosure

EQB Technical Comments

Draft Remedial Investigation/Feasibility Study Work Plan
For Area of Concern (AOC) I and AOC R
Former Naval Ammunition Support Detachment
Vieques Island, Puerto Rico
April 2004

INTRODUCTION

EQB has reviewed and provides the attached comments to the Draft Remedial Investigation/Feasibility Study Work Plan for AOC I and AOC R, dated April 2004.

The RI/FS Work Plan presents proposed RI/FS sampling activities at the two sites AOC I and AOC R. These two sites were previously investigated as part of the Expanded Preliminary Assessment/Site Investigation (PA/SI), Phase II, Seven Sites Report.

This review presents significant issues in the RI/FS Work Plan, as well as requests to clarify cited issues.

General Comment

1. It was very difficult to review this document since it combined two sites within the same report. In the future, all similar reports should address only one site.
2. The report should have included local topographic maps for the sites

Page-Specific Comments

1. Page ES-1, Paragraph 4 – Check the dates on period of operation for AOC-I. Based on the June CTC meeting the asphalt plant had been operated more recently than provided in the text.

2. Page ES-1, Paragraph 5 – Identify the potential sources of chromium contamination at this AOC, if any, other than crude oil origins.

3. Page ES-2, Paragraph 2 –
   a. Provide the rationale for performing a fingerprint analysis of the petroleum contamination at AOC I. Explain the proposed forensic and/or risk-related application of the data.
   b. Provide the rationale for performing hexavalent chromium analysis at this particular AOC. Include in the rationale the known or presumed source of the hexavalent chromium contamination.
   c. Note that should hexavalent chromium analysis be conducted in soil and sediment, it should be performed using ion chromatography (e.g., SW-846 7199). In addition, pH, sulfide, oxidation-reduction potential (ORP), and ferrous iron analyses should be conducted in conjunction with hexavalent chromium analysis in soil to determine the oxidation-reduction conditions (redox) conditions of the soil. Hexavalent chromium tends to exist under reducing condition, and this additional data will help to evaluate if hexavalent chromium could be present from a redox perspective.
   d. Clarify the rationale for analyzing groundwater for the presence of polychlorinated biphenyls (PCBs) and not soil. PCBs are not very soluble

In groundwater; therefore, groundwater analysis to evaluate past releases of PCBs is not appropriate in most cases consistent with the fate and transport characteristics of PCBs (e.g., low solubility, strong partitioning to soil and organic phases, and low volatility). However, PCB analysis of soil or sediments in areas of suspected release and/or downgradient runoff depositional areas is appropriate if a source of PCB contamination is suspected.

4. Page ES-2, Paragraph 3 – If the contents of the AST are unknown then indicate it, otherwise, indicate the contents.

5. Page ES-2, Paragraph 4 – Borings for monitoring wells should be logged continuously, rather than every five feet, over which the screen interval is to be emplaced.

6. Figure 1-3 – Is the black line outline the "AOC boundary" or the "access restriction boundary"? Figure 1-3 uses "access restriction" terminology.

7. Page 2-1, Section 2.1.1 – Describe where the sumps discharged and clarify if any sampling has (or will be) conducted in the discharge locations.

8. Page 2-1, Section 2.1.1 – Check the dates on period of operation for AOC-I. Based on the June CTC meeting the asphalt plant had been operated more recently than provided in the text. The use of the more recent portable asphalting operation may require additional sampling to determine its impact.

9. Page 2-1, Section 2.1.1 – Based on our experiences at other asphalt plants, the authors should determine whether asbestos was an additive used by the asphalt plant. Whether road oiling was conducted for dust suppression. Whether a laboratory was used for QA/QC of asphalt products, typically trichloroethene was used in the laboratory asphalt extraction analysis process. Whether used oil storage tanks were present. Whether an oiled stone product was made at the plant. Typically, oiled stone products would be made at any open land area of the site rather than in the primary operations area. If any of these operations were conducted, or documentation is unclear, it may require reconsideration in the sampling and analysis strategy to account for these operations.

10. Page 2-1, Section 2.1.1 – The text and figures need to be revised to provide a better correlation between the two. The description of AOC I includes identification of concrete containment areas and ASTs. These features are not identified on Figures 2-1 and 2-2.

    A review of Figures 2-1 and 2-2 shows a number of features such as concrete pads and a 5.5-inch concrete wall in a rectangular shape as well as relatively large open areas which may have been used for lay down or storage areas. No information is provided regarding the potential past uses for any of the features of the AOC. This information is needed to assess the adequacy of the proposed sampling locations and analytical parameters.

11. Page 2-1, Section 2.1.2 – The text description needs to be expanded regarding the former use/contents of the "large AST". No information is provided as to this large tank and how it relates to the rest of AOC R. It is not clear if the contents of the AST were transported to the remainder of AOC R via containers or

whether some form of piping existed.

Additionally, an area surrounded by a 6-foot high chain link fence with 3-strand barbed wire is shown in Figure 2-3 with no description provided in the text as to what may have been stored/conducted at that location. This results in a lack of understanding being presented as to the appropriateness of sample locations and analytical parameters.

12. Page 2-1, Section 2.1.2 – The area of light vehicle maintenance referred to in the text should be shown on Figure 2-3.

13. Page 2-4, Paragraph 5 – Provide documentation of the original intended use of the large concrete pad and pad integrity (e.g., cracks, gaps, holes).

14. Page 2-5, Paragraph 8 –

    a. Provide documentation supporting the assertion that the SVOC results may reflect previously paved areas. Suitable documentation includes aerial photographs clearly demonstrating the presence of asphalt pavement and/or soil boring observations/logs or photographs documenting the presence of visible pavement pieces/residues.
    b. Identify the area of suspected prior pavement on Figures 2-3.
    c. Clarify if the area of former paving cited in this paragraph is coincident with samples SS-17, SS-18, SS-26, SS-27, SS-28, SS-30, SS-31, and SS-32.

15. Page 2-2, Section 2.2.2.1 and 2.2.2.2 – If groundwater flow direction varies from the presumed northerly direction then additional wells may be required to further characterize groundwater flow direction.

16. Figure 2-2 – Information must be provided regarding the depth of each soil boring, any field screening results, and the depth from which the sample submitted to the laboratory was collected.

17. Figure 2-3 – The orientation of the site presented in this figure does not correlate with Figure 1-4. Aligning the north arrows of each figure results in two different orientations of the concrete pad (southwest to northeast in Figure 1-4, and northwest to southeast in Figure 2-3). The correct orientation must be determined and the figure(s) adjusted as necessary.

18. Section 3.1.2 – The migration to groundwater screening criteria should be based on a dilution factor of 1, not 20. The use of a DAF factor of 20 must be supported by site-specific data that demonstrates that this DAF is appropriate (i.e., hydraulic conductivity, hydraulic gradient, size of impacted area and depth of aquifer mixing zone). The hydrology of the sites has not been evaluated.

19. Section 3.2.1, paragraph 3: See comment to Section 3.1.2 regarding leachability criteria.

20. Page 3-2, Section 3.2.1 – Samples should be collected of the "moderate quantities of wet or dry asphalt emulsion within the containment area" for chemical testing. The amount of asphalt waste remaining at the site should be described, its hazardous properties determined, and recommendations for

treatment or disposal of this waste should be provided.

21. Page 3-2, Section 3.2.1, Paragraph 4 – Surface runoff is stated to be the potential contaminant migration pathway of concern. However, no figures in the workplan present any topographic information for AOC I. If surface water runoff is a significant pathway, sample collection efforts must be designed to assess the presence or absence of contamination along any runoff pathways (down slope, along swales, etc.). In the absence of topographic information, it is not possible to verify that the proposed sampling program is adequate.

22. Page 3-3, Section 3.2.2, Paragraph 2 – As with AOC I, surface water runoff is stated to be a significant potential contaminant migration pathway, however no topographic data is provided to aid in identifying runoff flow paths relative to proposed sample locations.

23. Page 3-3, Section 3.3, Paragraph 3 – Modify the discussion regarding ARARs to clearly state that the requirements mentioned are limited to only some potential chemical-specific ARARs. Action-specific and location-specific ARARs must also be evaluated during the screening of potential remedial alternatives.

24. Figures 3-1 and 3-2 - The conceptual site models should show all receptors and exposure pathways considered and should include the rationale for eliminating receptors and exposure pathways from consideration for each site as required by US Environmental Protection Agency (EPA) Risk Assessment Guidance for Superfund (RAGS) Part D guidance (which is listed in Section 5.2 as a reference for conducting the human health risk assessment).

25. A construction worker should be added to the conceptual site models unless both sites will have institutional controls that eliminate future construction activities. The ingestion of home-grown vegetables exposure pathway should be included in the CSMs. Once the chemicals of potential concern have been identified in soils from 0 to 3 feet bgs, an evaluation of whether this pathway is a potentially complete pathway can be conducted. It should be noted that MADEP has guidance for quantifying this exposure pathway. Sampling depths should be consistent with root depths for produce grown in this region.

26. Section 4.3.1.4, paragraph 2 - Site-related contamination should be evaluated in a risk assessment and not be eliminated based on background concentrations, per EPA guidance (Role of Background in the CERCLA Cleanup Program). Therefore, background values for asphalt-derived constituents must not be used to eliminate asphalt-derived constituents from quantification in the risk assessment.

27. Section 4.3.1.4, paragraph 5 - The work plan does not address how TPH will be evaluated in the risk assessment. Data collected during the PA/SI Phase II is not appropriate for risk assessment. As stated previously, appropriate petroleum analytical methods and risk assessment methods should be used to evaluate risks associated with exposure to petroleum contamination. The screening criteria used to evaluate the data generated from the PA/SA Phase II included migration to groundwater criteria at a DAF of 20. As stated previously, the migration to groundwater screening criteria at a DAF of 1 should be used. All data should be re-screened. Analysis of all constituents exceeding the appropriate migration to groundwater criteria should be conducted as part of the

RI.

28. Section 4.3.1.4, paragraph 6 - The purpose of the sampling is to characterize impacts associated with historic releases at this site. Due to evidence of historic site grading and reworking as documented in the Environmental Baseline Survey, soils at grade are not representative of soils impacted by past releases. Therefore, in addition to collecting surface soil samples from 0-6 inches, samples should be collected from 6 inches to 2 feet to fully characterize the top 2 feet of surface soil. Field screening should be conducted to determine if contamination is present from 2 to 4 feet bgs, rather than selecting a sampling depth of 4 to 6 feet bgs to be consistent with past sampling.

29. Table 4-5 - The analytical suite is not provided on this table; therefore, it is unknown whether the analyses are appropriate for risk assessment data requirements.

30. Section 4.3.2, paragraph 1 - Please correct location of MW05 and MW06. The text refers to MW05 located to the northwest and MW06 located to the northeast; however, figure 4-3 is not consistent with this description.

31. Section 4.3.2, paragraph 2 - Fluctuations in the water table should be considered in the vertical placement of the well screen. Typically, 5 feet of well screen is above the water table and 5 feet is below to allow for groundwater level fluctuations.

32. Section 4.3.2.2, paragraph 1 - Appropriate TPH analysis should be included in the analytical suite to provide data to evaluate potential risks associated with petroleum contamination.

33. Section 4.3.2.4, paragraph 1 - The analytical suite for the AST should include metals, PCBs and pesticides unless historical records are available that indicates what the contents of the AST were or if previous subsurface soil samples were analyzed for and did not detect these analytical groups. The analytical suite for surface and subsurface soil samples in the vicinity of the concrete pad should include VOCs due to historical use of the pad as a carpentry shop. Appropriate TPH and VOC analysis should be included for surface and subsurface soil samples collected in the former mechanics shop (vehicle maintenance) area.

    The purpose of the sampling is to characterize impacts associated with historic releases at this site. Past uses include a mechanics shop and carpentry shop. These types of shops typically use and dispose of various volatile organic compounds (VOCs). Historic uses should be considered in determining appropriate analytical methods. Therefore, VOCs should be included in the list of analyses for soil.

34. Table 4-8 - The TPH method listed is 314. Please provide documentation for this method prior to conducting field sampling. As stated previously, the TPH analyses should be appropriate for the risk assessment methodology to be used to evaluate potential risks associated with petroleum contamination.

35. Page 4-3, Section 4.3.1.1 – The conclusive statement that "groundwater at the site flows to the north" is unsupported by site data. On the prior page, the authors indicate that "no monitoring wells were installed previously" so a firm

statement of groundwater flow direction is premature.

36. Page 4-4, Section 4.3.1.2, Table 4-4 – The laboratories must use the most current Contract Laboratory Program (CLP) Statements of Work (SOWs) for semivolatile organic compounds (SVOCs) and pesticides/polychlorinated biphenyls (PCBs), as is being done for the volatile organic compound (VOC) method. Therefore, OLC02.1 must be changed to OLC03.2 for SVOCs and pesticides/PCBs. It should be noted that the SVOC list in OLC03.2 contains additional compounds in comparison to OLC02.1.

37. Page 4-5, Section 4.3.1.3 – All 6 wells should be tested for hydraulic conductivity or else a method for selecting representative wells for testing should be determined.

38. Page 4-5, Section 4.3.1.4, Paragraph 2 – The text states than total petroleum hydrocarbon (TPH) fingerprinting will be performed to determine the type of asphalt used at the site. This section needs to be further expanded and more analytical details need to be provided. It is unclear if the purpose of this test is to determine if the contamination is due to asphalt or determine a potential source of the asphalt (if more than one may exist). Depending on the objective, different analyses would apply. If the purpose is to simply determine whether or not asphalt is present, a gas chromatograph/flame ionization detector (GC/FID) analysis of the sample extract would be appropriate but would need to extend up to the C_{45} range of the chromatogram. If the source or type of asphalt needs to be determined, analyses for parent polynuclear aromatic hydrocarbons (PAHs), alkylated PAHs, and biomarker compounds would need to be performed by a laboratory specializing in forensics. Since no methods were provided in Table 4-5, clarification on how the TPH fingerprinting will be performed must be provided.

39. Page 4-5, Section 4.3.1.4, Paragraph 3 – The text states that four surface soil samples will be collected in the outer downgradient ring but will only be analyzed if the inner ring results are above the screening criteria. Due to the 14-day holding time to extraction and/or analysis for SVOCs, TPH-diesel range organics (DRO), and TPH-gasoline range organics (GRO), these samples should be analyzed, regardless, unless expedited turnaround time is expected from the laboratories.

40. Page 4-5, Section 4.3.1.4, Paragraphs 3, 4, and 5 – Soil samples being analyzed for hexavalent chromium should also be analyzed for pH and oxidation-reduction potential. As indicated in the digestion procedure for hexavalent chromium (SW-846 3060A), these parameters play a very important role in determining whether or not hexavalent chromium can even exist in the matrix of interest (i.e., whether or not a reducing or oxidizing environment exists) and can be used to further support nondetect results for hexavalent chromium if it is determined that a reducing environment exists.

41. Page 4-5, Section 4.3.1.4 – Field logs should be collected associated with soil sampling and indicate whether non-natural materials were encountered during soil sampling and the position of these materials in the borehole. Indications of non-natural materials encountered during boring should be described in full in the summary report.

42. Page 4-6, Section 4.3.1.4, Table 4-5 –

a. This table does not include method numbers, as indicated in the header of the table, and as done for Table 4-4 for groundwater samples. The table must be revised to include the method numbers.

b. The table should include Trip Blanks, which would be submitted with the TPH-GRO samples.

c. It is expected that hexavalent chromium analysis of soil samples will be performed using SW-846 methods 3060A/7199.

d. Equipment blanks, field blanks, and matrix spikes/matrix spike duplicates (MS/MSDs) are not necessary for the TPH fingerprinting analysis since this is not a quantitative analysis.

43. Page 4-8, Section 4.3.2.2, Table 4-7 – The laboratories must use the most current CLP SOWs for SVOCs, pesticides/PCBs, and metals as is being done for the VOC method and for the metals method for AOC I in Table 4-4. Therefore, OLC02.1 must be changed to OLC03.2 for SVOCs and pesticides/PCBs and ILM04.0 must be changed to ILM05.2 for metals. It should be noted that the SVOC list in OLC03.2 contains additional compounds in comparison to OLC02.1.

44. Page 4-8, Section 4.3.2.3 – All 6 wells should be tested for hydraulic conductivity or else a method for selecting representative wells for testing should be determined.

45. Page 4-9, Section 4.3.2.4 – Field logs should be collected associated with soil sampling and indicate whether non-natural materials were encountered during soil sampling and the position of these materials in the borehole. Indications of non-natural materials encountered during boring should be described in full in the summary report.

46. Page 4-9, Section 4.3.2.4, Table 4-8 –

a. The laboratory must use the most current CLP SOW for SVOCs and metals, as is being done for the VOC method for groundwater and the metals method for AOC I in Table 4-4. Therefore, OLC02.1 must be changed to OLC03.2 for SVOCs and ILM04.0 must be changed to ILM05.2 for metals. It should be noted that the SVOC list in OLC03.2 contains additional compounds in comparison to OLC02.1.
b. The current method listed for TPH is 314, which is a perchlorate method. This should be revised to be SW-846 8015B, assuming this is intended to measure TPH-DRO and TPH-GRO. This was not clearly addressed in the text as it was for AOC I.
c. The number of field duplicates for metals must be increased from two to three to meet the frequency requirement of 1/10 samples.
d. The number of field duplicates for SVOCs must be increased from two to four to meet the frequency requirement of 1/10 samples.

47. Figure 4-1 – Identify/illustrate the following on this figure:

a. The location of the sump pumps mentioned in paragraph 5 on page ES-1.
b. The volumes of the two diesel fuel ASTs.
c. The two concrete-paved containment areas mentioned in paragraph 5 on

page ES-1.

d. Identify the circular object in the northeastern corner of the "Access Restriction Boundary" flagged with "Toe of Slope." Clarify if this object represents a spoils pile, debris, or other material potentially requiring characterization.
e. Identify the purpose of the "5.5" Concrete Wall" located in the northern end of the "Access Restriction Boundary."

48. Figure 4-1– First, the site should be reviewed for operational history to determine the most likely location for contaminants to be released and wells should be placed at these locations. In the event that no operational data is available, then we suggest moving Monitoring wells MW-2 and MW-4 should be relocated. MW-2 should be placed 10-20 feet north of the ramps, MW-4 should be placed 10-20 feet northwest of SB-25 (presumed downgradient of the ASTs and centered on the ASTs). The previously planned locations were more indicative of background than release area impacts. The new suggested locations should detect operations impacts. Note that if cracks in the concrete, surface staining, collection sumps or other indications of impacts are located in the operations area then the wells should be moved to center them directly downgradient of these area as close to the observed impact area as possible.

49. Figure 4-3 – It appears that there is a heavily vegetated area just west of the site that may represent a stream area, presumably at a lower elevation. Groundwater will likely flow in a westerly or northwesterly direction towards this depression. MW-2 should be relocated to be immediately west of the former AST and MW-2 should be relocated to be due north of the tank, and much closer than shown. If the tank is no longer present, but the foundation is identified, then either MW-2 or MW-3 should be placed in the center of the old foundation. An additional well should be placed at the center of the area where light vehicle maintenance activities were conducted.

50. Figure 4-3 – If the AST tank foundation or containment berm area is earthen then the 4 soil samples should be collected from the foundation area and berm containment areas. If the tank containment and foundation are constructed of metal or concrete then the soil samples should be collected from the nearest visually impacted soils or from drainage areas as close to the tank containment area as possible. Also shallow soil samples should be collected from the area where light vehicle maintenance activities were conducted. Also if sediment and surface water is present in this depression, upstream, midstream and downstream surface water and sediment samples should be collected from the apparent stream due west of the site. Analyses should include those parameters measured in site soils as well as total organic carbon and grain size for sediment and pH and hardness for surface water. A staff gauge should be installed and surveyed to determine the elevation of the stream water level relative to groundwater measured at the site.

51. Section 5 – The method for evaluating petroleum contamination in the HHRA should be included in the HHRA work plan. The PA/SI Phase II report indicates that petroleum contamination above 100 mg/kg "...is an indicator of a petroleum release, but does not serve as a risk-based criterion to assess risk to human health..." This statement indicates that petroleum data will be evaluated in the human health risk assessment. If that is the case, the method for evaluating petroleum data should be provided in the HHRA and appropriate analytical

methods should be employed to ensure that the data reported is consistent with the toxicity values and chemical and physical parameter values used in the risk assessment to evaluate exposure to petroleum hydrocarbon contamination. For example, if Massachusetts Department of Environmental Protection risk assessment methodology will be used to evaluate petroleum hydrocarbon contamination, then the appropriate MADEP petroleum analytical methods should be used (i.e., volatile petroleum hydrocarbon (VPH) and extractable petroleum hydrocarbon (EPH) methods and appropriate constituent analysis (BTEX, PAHs, metals, etc.).

In accordance with EPA RAGS Part D, each section should identify the tables that will be provided as interim deliverables for regulatory review and a schedule should be provided that identifies the timeframe for submittal of these interim deliverables.

53. Section 5.2, paragraph 1 - This section should include EPA's RAGS Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim EPA/540/R/99/005 (September 2001) and EPA's Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (November 2002).

54. Section 5.2, paragraph 2 - The CSMs should present all receptors and exposure pathways considered and the rationale for exclusion, as required by EPA RAGS Part D.

55. Section 5.2.1, paragraph 1 - Migration to groundwater criteria at a DAF of 1 should be used as screening criteria. Migration to groundwater values at a DAF of 20 are not sufficiently conservative for sites where it is not documented that a DAF of 20 is appropriate.

56. Section 5.2.2, paragraph 2 - It should be noted that the use of land uses other than residential will require institutional controls restricting activities and uses of the sites.

57. Section 5.2, paragraph 6 - Non-parametric methods should be employed for datasets that are not normally or log-normally distributed. EPA's ProUCL software should be used to evaluate the distribution of the dataset and calculate appropriate EPCs.

58. Section 5.2, paragraph 7 - It is not acceptable to restrict the evaluation of a residential exposure scenario to one ½-acre area. The extent of each source area identified at each AOC should be used as the exposure area for all exposure scenarios. The only reference to ½-acre exposure areas is provided in EPA's Soil Screening Guidance User's Manual and EPA points out that this size was used to represent a standard suburban residential lot. Unless it is known that these sites will be developed into ½-acre lots, the exposure area should represent each release area at each AOC. The maximum or 95% UCL concentration for each COPC should be used for all exposure scenarios. Furthermore, EPCs should be calculated using data representative of the exposure scenario and pathway. An industrial worker will likely be exposed to contaminants in surface soil. A construction worker will be exposed to surface and subsurface soil. EPCs should be calculated using datasets comprised of samples collected at appropriate sample depths.

59. Section 5.2, paragraph 2 - A construction worker exposure scenario is typically evaluated to 15 bgs. If contamination is present at 6 feet bgs, additional investigation may be required to adequately characterize the site and to develop appropriate EPCs for the construction worker scenario. Limiting soil samples to 6 feet bgs will require an institutional control to ensure that future construction activities do not take place below this depth. EPA requires soil gas samples to evaluate vapor inhalation within buildings from vadose zone sources. If VOCs are detected in soil bulk samples, soil gas samples will be required in order to evaluate this potentially significant exposure pathway.

60. Section 5.2, paragraph 3 - The sampling conducted in surface soil is insufficient to determine that VOCs are not present at the site. EPA states that volatiles are not expected to remain at the surface for an extended period of time (EPA SSL User's Guide). Therefore, samples collected at 0 to 6 inches are unlikely to detect VOCs. Samples should be collected from subsurface soils (e.g., 6 inches to 2 feet) in order to determine whether VOC impacts are present. Volatilization from site media should be evaluated quantitatively in accordance with current EPA guidance for evaluating vapor intrusion into buildings.

61. Section 5.2.3, paragraph 1 - EPA considers HEAST a Tier III reference. The appropriate hierarchy is (1) IRIS, (2) provisional values obtained from EPA, and then (3) then other values, including HEAST values. Refer to EPA's Memorandum entitled "Human Health Toxicity Values in Superfund Risk Assessments" dated December 5, 2003. Toxicity criteria should be provided as an interim deliverable for regulatory review as required by RAGS Part D.

62. Section 5.2.4 - Non-cancer HIs should be compared to a risk management level of 1 (unity). There is no risk range for HIs. Revise the text accordingly. The presentation of risk should be consistent with RAGS Part D Tables 7, 9 and 10.

63. Page 6-1, First Bullet – The general potential Remedial Action Objective (RAO) for the Former NASD sites needs to reference the acceptable contaminant level or range of levels for each exposure route as stated in the RI/FS Guidance (EPA, 1988).

64. Page 6-1, Paragraph 2 – It is not clear how institutional controls are protective of the environment as stated in the second sentence. This statement should be deleted.

65. Page 6-1, Second and Third Bullets – The goals stated should include reference to what is to be considered acceptable contaminant concentrations.

66. Page 7-2, Feasibility Study Report Outline – The text on lines 7 and 7.3 need to be revised to read "Identification and Screening of ..."

EPA's Comments on
Draft Remedial Investigation / Feasibility Study Work Plan
For AOC I and R
Former Naval Ammunition Support Detachment
Vieques, Puerto Rico
April 2004

1. The work plan needs to contain a more detailed description of AOC I, including the following: a) Discuss specific activities conducted at the site and in sub portions of the site. For example, how were the containment areas used? What was the layout of asphalt production activities? Were materials stored at the site prior to their use in asphalt production, and if so, where? What was the purpose of the sheet metal retaining wall and what implications does this hold for material handing and contaminant distribution? What is the 5.5' concrete wall at the north end of the site and how was this area used? This sort of information is needed to evaluate sampling locations and the overall approach to the site. b) The work plan mentions that the containment areas each contain sumps. These should be located on a figure and their use and discharge should be discussed. c) Include information on the diesel fuel ASTs, including any information on the time period they were used, as well as on their closure.

2. Page ES-1: The text notes that 'asphalt emulsion' has been observed in the containment areas. The work plan needs to discuss and include investigation of this material to determine its nature and extent. The RI should clearly define whether this material presents a hazard.

3. It is noted that a DAF of 20 has been used in the past for the sites. This may be appropriate, but new information from the RI, such as more detailed subsurface stratigraphy and depth to the water table, should be used to evaluate the appropriateness of using this default.

4. Page 2-5: The text refers to previously paved areas at AOC-R. If available, information on which areas were paved (and over what time period) should be presented.

5. Figure 2-3: Please indicate what the fenced concrete area to the south of the pad was used for and if it represents a possible area that should be investigated.

6. Please indicate what the AST at AOC-R was used for, as well as information on how long it was present and any closure activities.

7. Page 4-3: The text states that soil samples will be screened with a PID. As a point of clarity, indicate that all split spoon samples will be screened. In the PA/SI, it appears that screening only took place of the breathing zone and above the hole.

8. Borings for monitoring wells should be logged continuously, rather than every five feet, over the interval which the screen is to be emplaced.

9. Monitoring well locations, Figure 4-1: Well locations need to be re-evaluated in the context of a better description of site activities and a more detailed figure, as noted in a comment above. Based on the present information, the following is noted: a) Wells MW- 02, MW-03 and MW-04 are all located on what is presumed to be the up gradient side of the process area. Placing one well here, targeting the area of maximum known TPH concentrations is appropriate. But it is more efficacious to place other wells just to the north of where site activities took place - or directly in the process area where possible. If groundwater contamination is present, it is more likely to be detected just down gradient of the entire possible source zone. Although any new information on site history may effect final locations, the EQB recommendations on amending what is proposed should be followed. b) A well should be placed in vicinity of the former ASTs, with a profiling of soils to the water table.

10. Page 4-5: The work plan should name the wells to be slug tested or the criteria by which wells will be selected. This applies to both AOCs.

11. Monitoring well locations, Figure 4-3: A well should be placed in the center of the vehicle maintenance area (e.g. Near SS-27) to determine if groundwater has been impacted right in the likely source area. Similarly, a well should be located just north of the pad for the AST. Other proposed wells may be shifted so that this does not require additional wells beyond those proposed.

12. Soil sampling, AOC I: a) Samples of the emulsified material in the containment areas should be collected and run for VOCs, SVOCs, fingerprinting, and total chromium. This will aid in characterizing the source material for site contaminants. b) In order to delineate contaminant extent to the west, additional sampling points are needed, bounding the concentrations detected at SB-01 and SB-03. c) The work plan includes hexavalent chromium analyses for new surface samples. As these samples are for delineation, total chromium should be run. If attempts to speciate the chromium are included, there should be an overall approach to determine the speciation at the entire site. Three additional soil samples for chromium and hexavalent chromium are included (one surface and two subsurface samples). The work plan should discuss the intended data use for these samples and justify how the quantity of samples fills the data need. d) The drill log for location SB-21 indicates a strong solvent odor and PID readings at 4-6 ft bgs. Soil analysis did not indicate VOC contamination. This location should be revisited and drilling should proceed to a depth at which no odor or PID readings are detected. Re- sampling of the horizon with the highest screening levels should be conducted, as well as a deeper sample from a horizon presumed to be clean. If one of the final monitoring well locations were placed here, the sampling could be done in conjunction with drilling. Sampling should be continuous until clearly below a depth of concern.

13. Soil sampling, AOC R: a) The sample locations around the AST should be next to the pad or targeting specific areas which appear to be stressed or stained. The present figure suggests that the samples will be some distance from the margin of the pad. b) The northwestern-most soil sampling locations appear to be in some sort of active area (based on the aerial photo). Please discuss what this area was used for. A better quality copy of the aerial photo should provide a better idea of what is seen here as well. If this represents a potential source area, one of the monitoring wells should be located in the area, rather than down gradient of it. c) Please indicate why location SS-30 is being resample.

14. Section 4.4.1: As has been noted in the past, EPA region 2 is adopting standard EDD formats and these should be used for the Vieques work. The formats can be downloaded at the following URL: http://www.epa.gov/region02/superfund/medd.htm

15. Figure 1-2: This figure depicts the locations of AOC I and AOC R on the northwestern portion of Vieques Island. The site descriptions provided in the Executive Summary on pages ES-1 and ES- 2 note that AOC I is located 1,500 feet south of Mosquito Pier. However, the work plan does not indicate how far from the coastline AOC R is located. This information is needed to determine the adequacy of the down gradient soil sampling proposed. Further, the size of AOC R should be provided.

16. Section 2.3.1.2, Ecological Survey: A discussion of the surface drainage patterns for each Site should be provided. Because of the close proximity of the Sites to the coast of the Island, this information is essential to determine if the proposed locations of the surface soil samples are adequate to evaluate the potential offsite migration of site related contaminants. The work plan should note whether the surface soil sample locations were selected based on surface drainage patterns and migration pathways.

17. Section 3.1 Human Health and Ecological Protection Based Screening Values, page 3-1: Figures 3-1 & 3-2 show potential pathways to sediment. Therefore it should be noted whether sediment and surface water are media of concern, and whether there are surface water bodies which could potentially receive runoff. If there are, appropriate screening values should be provided. In addition, it should be noted whether there is a groundwater to surface water pathway.

18. Section 3.1.2 Soil, page 3-1: Appropriate soil screening values and toxicological benchmarks can be found in sources such as the USEPA's Draft Ecological Soil Screening Levels (SSL) (http://www.epa.gov/ecotox/ecossl), as well as the *Preliminary Remediation Goals for Ecological Endpoints* (Efroymson, R.A., G.W. Suter, II, B.E. Sample and D.S. Jones. 1997. Oak Ridge National Laboratory, Oak Ridge, TN) and the *Toxicological Benchmarks for Wildlife: 1996 Revision* (Sample, B.E., D.M. Opresko, and G.W. Suter II. 1996. Oak Ridge National Laboratory, Oak Ridge, TN), both of which can be found at http://www.hsrd.ornl.gov/ecorisk/reports.html. A copy of the Region IV memorandum should be provided to us for our review and consideration.

19. Section 4.1 Data Quality Objectives, Table 4-1 (AOC I): During the PA/SI metals were found in surface soil. Therefore it is recommended that the forthcoming sampling include metals in surface soil. It is recommended that the 12 surface soil sample locations identified for TPH/SVOC (Figure 4-2) include metals analysis.

20. Section 4.3.1.4 Soil Sampling and Analysis, page 4-5: Future surface soil sampling should encompass the top 12" rather than the top 6". Data representing the top 0-6" may under- or overestimate actual risk to ecological receptors. As discussed above, the work plan should include analysis for metals in soil at AOC I.

21. Table 4-4 and 4-7, Groundwater Sample Parameters: Justification should be given as to why groundwater samples are being analyzed for VOCs, PCBs and pesticides, in addition to SVOCs and metals, but soil samples are not. Also, it is

noted that groundwater samples at AOC R will be analyzed for explosives, however there is no discussion of analyzing soil for explosives.

22. Section 5.3.1..3 Screening Level Ecological Effects Evaluation, page 5-6: See previous comments regarding appropriate soil screening values.

23. Section 7. Remedial Investigation/Feasibility Study Report, page 7-1: Field activities (Section 2) should include surface soil sampling.

24. From an organizational perspective, it may add to the clarity of the report if the two AOCs were each presented separately. For example, all information (site setting, previous investigations, etc.) should be presented for each site, rather than alternate the information between the two sites.

25. Throughout the document, background concentrations for inorganics are presented. In order to improve consistency and clarity, it may be helpful to add a paragraph or section at the beginning of the document that summarizes the background report. For example, text that includes the number of samples that were collected, the depth from which they were collected, the number of different locations from which they were collected, and a table of the ranges of concentrations for the inorganics in the media are all useful items that would help a reviewer focus on the science that was used to develop the background document.

26. At both AOCs, hexavalent chromium is analyzed in certain media, but not total chromium. This is unusual, since the typical approach for determining the extent of hexavalent chromium at a site is to analyze for both forms. Please revise the language to clearly state the purpose of sampling and analyzing for hexavalent chromium and total chromium. EPA will review this approach and offer suggestions on whether it is appropriate. Also, please ensure that the analytical method and appropriate QA/QC procedures for hexavalent chromium in soil has been reviewed.

27. Page 2-3, Section 2.3.1.4: In bullets listed in the "Metals" section, please clarify how many samples were collected. For example, the first bullet states that there were two exceedances of chromium when compared to the screening values. It would be helpful to know that there were two exceedances out of how many samples, as this is important information that helps to present a more robust picture of the site and the contamination identified in past sampling events. This information should be presented consistently throughout the document.

28. Page 2-5, Section 2.3.2.2.4: In the second bullet under the "Metals" section, the text states that a PRG-R (R) value is 2,346 mg/kg. Please use the appropriate number of significant figures for all concentrations. Revise the document as necessary.

29. Figure 2-1: There are a few errors in this figure, and in others throughout the document:
    A. Please correct the term "Mg/Kg" in the legend; the correct unit is "mg/kg".
    B. Please correct the spelling of "concentrations" in the legend.

C. Please add the term "EQB" to the legend and explain what this means. For example, the legend states that the screening criteria are limited to "I", "L", and "R". How does the EQB value fit into this characterization?

D. Please clarify if the soil results are surface or subsurface.

30. Figure 3-2: Please clarify why recreational exposure to surface water and sediment is not evaluated.

31. Page 4-5, Section 4.3.1.4: Please explain why subsurface soils at AOC I will not be analyzed for SVOCs and VOCs. Although the nature and extent of TPH contamination has been delineated, has the delineation of the constituents been completed?

32. Figures 4-3 and 4-4: Why are no soil samples or monitoring wells recommended for the area of AOC I directly south of the concrete pad?

33. Page 5-3: The paragraph that begins, "The EPCs will be the upper 95% ..." should be revised to state that data that are non-parametric will also be evaluated and an appropriate EPC will be developed for these data.

34. Page 5-3: In the last sentence of Item 1 on this page, please clarify what is meant by, "The risk assessment will be performed using maximum concentrations at these intersected sample locations."

35. Page 5-4, Section 5.2.3: In OSWER Directive 9285.7-53 dated December 5, 2003, the hierarchy of toxicity values is presented. This directive states that the hierarchy shall include the IRIS database as Tier 1, EPA's provisional peer reviewed toxicity values as Tier 2, and other toxicity values as Tier 3. Please revise this section.

36. Page 5-9, Section 5.4.1: Please explain how activity-specific ARARs will be developed. ARARS are typically promulgated numbers; how are activity-specific ARARs going to be developed for AOCs I and R?

37. Page 5-9, Section 5.4.2: The text states that RGOs will be developed as per EPA Region 4 guidance. Why would CH2MHill suggest using guidance from Region 4, rather than Region 2 guidance or national guidance?

38. Table 5-1:

A. The soil ingestion rate for the worker populations should be revised. EPA recommends using a soil ingestion rate of 50 mg/day for workers who are primarily indoors, while the soil ingestion rate of 100 mg/day is appropriate for those workers who spend a significant portion of time outdoors. EPA recommends using 100 mg/day for the maintenance worker.

B. Footnote b references a document from Region 4. Why is Region 4 guidance being used at a site in Region 2?

C. Please verify the reference for the body weight for the recreational youth.

D. Please revise the soil to skin adherence factors for the maintenance worker and industrial worker to 0.02 mg/cm^2 and for the residential child, recreational child and recreational youth to 0.2 mg/cm^2. The reference for these values is RAGS Part E (OSWER 9285.7-02EP).

E. The PEF value is based on defaults, including a site size of 0.5 acre and 50% vegetative cover. Is this appropriate for AOCs I and R? If not, site-specific PEFs should be developed.

F. Why are age-adjusted values for ingestion rate, inhalation rate, and dermal contact included in this table?

39. Table 5-2:

A. The incidental ingestion rate for water while wading/swimming is 0.050 L/hour. The reference is RAGS Part A.

B. The exposure frequency for the recreational adult, recreational child, and recreational youth appear to be a bit low, at 50 days per year. This value is referenced to a Region 4 guidance document. Region 2 would suggest a value of 3 days per week for the year, or 150 days per year. Please provide further explanation of why a Region 4 guidance document is referenced, and how this value is appropriate to Vieques.

C. Footnotes b, j, and k reference a document from Region 4. Why is Region 4 guidance being used at a site in Region 2?

D. Please select soil to skin adherence factors for all populations from the RAGS Part E reference document (OSWER 9285.7-02EP).

40. Table 5-3:

A. Why are age-adjusted values for ingestion rate and dermal contact included in this table?

B. The reference for the skin surface area for all three populations is RAGS Part E reference document (OSWER 9285.7-02EP).

41. The individuals or organizations participating in the project should be identified and their specific roles and responsibilities should be discussed. The project quality assurance manager must be independent of the unit generating the data. The individual responsible for maintaining the official, approved QA Project Plan should also be identified.

42. An organization chart should be provided showing the relationships and the lines of communication among all project participants. The organization chart must also identify any subcontractor relationships relevant to environmental data operations, including laboratories providing analytical services.

43. The Work Plan should clearly describe the problem or decision that is being answered by the proposed sampling event. Although it is stated that the additional data will be used to further delineate the site, the report does not provide an explanation of the deficiencies of the previous study nor does it describe how the additional sampling and analysis will cover any remaining data gaps. This information should also be provided in the QAPP.

44. Section 4.1 – The information contained in this section does not adequately describe the systematic planning process used to determine the data needs for this project. EPA's recommended process is delineated in *Guidance for the Data Quality Objectives Process (QA/G-4)*, August 2000, available at http://www.epa.gov/quality1/qs-docs/g4-final.pdf. A description of the systematic planning process used for this project should be included in the QAPP requested by comment # 45 below.

45. It is stated in other related documents that these projects were to be accomplished following Superfund procedures. In accordance with EPA Superfund policy, a Quality Assurance Project Plan (QAPP) must be submitted for approval. The QAPP should comply with *EPA Requirements for QA Project Plans* (EPA QA/R-5, March 2001). Guidance on preparing QAPPs may be found in a companion document, *Guidance for Quality Assurance Project Plans,* EPA QA/G-5, December, 2002. These guidance documents can be found at: http://www.epa.gov/quality1/qa_docs.html. Some the elements that must be present in an approved QAPP are:

GROUP A: PROJECT MANAGEMENT

A1 - Title and Approval Sheet
A2 - Table of Contents
A3 - Distribution List
A4 - Project/Task Organization
A5 - Problem Definition/Background
A6 - Project/Task Description
A7 - Quality Objectives and Criteria
A8 - Special Training/Certification
A9 - Documents and Records

GROUP B: DATA GENERATION AND ACQUISITION

B1- Sampling Process Design (Experimental Design)
B2 - Sampling Methods
B3 - Sample Handling and Custody
B4 - Analytical Methods
B5 - Quality Control
B6 - Instrument/Equipment Testing, Inspection, and Maintenance
B7 - Instrument/Equipment Calibration and Frequency
B8 - Inspection/Acceptance of Supplies and Consumables
B9 - Non-direct Measurements
B10 - Data Management

GROUP C: ASSESSMENT AND OVERSIGHT

C1 - Assessments and Response Actions
C2 - Reports to Management

GROUP D: DATA VALIDATION AND USABILITY

D1 - Data Review, Verification, and Validation
D2 - Verification and Validation Methods
D3 - Reconciliation with User Requiremen