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March 23, 2005

Mr. Adolph Everett, P.E.
Chief, RCRA Programs Branch
Division of Environmental Planning and Protection
U.S. Environmental Protection Agency
Region 2
290 Broadway, 22nd Floor
New York, NY 10007-1866

Re: Responses to Comments - USEPA letter dated January 4, 2005 re Atlantic Fleet Weapons Training Facility (AFWTF) - EPA I.D.# PRD Comments on Navy's October 28, 2004 Draft Technical Memorandum on Background Investigation Work Plan

Dear Mr. Everett:

On behalf of the Navy, CH2M HILL is pleased to submit the Responses to Comments on the subject document. Additional copies of the subject document have been sent to the individuals listed below. In accordance with Mr. Tim Gordon's correspondence, dated March 11, 2005, the *Final Work Plan and Sampling and Analysis Plan, Soil Background Investigation, Former Atlantic Fleet Weapons Training Facility, Vieques, Puerto Rico*, revised to reflect the enclosed response to comments, will be submitted on April 1, 2005.

Should you have any questions, please do not hesitate to contact Mr. Chris Penny at (757) 322-4815 or me at (757) 518-9666.

Sincerely,

G. Brett Doerr
CH2M HILL
Environmental Manager

cc: Mr. Tim Gordon/USEPA RCRA Programs Branch, Caribbean Section
Mr. Carl Soderberg/USEPA Caribbean Environmental Protection Division
Mr. Daniel Rodriguez/USEPA Caribbean Environmental Protection Division
Mr. Esteban Mujica Cotto/PREQB
Ms. Yarissa Martinez/PREQB
Mr. Bud Oliveira/USFWS, Caribbean Division
Sr. Oscar Diaz/USFWS, Vieques National Wildlife Refuge
Sr. Felix Lopez Arroyo/USFWS, Boqueron Field Office
Mr. Byron Brant/Navy
Mr. Christopher Penny/Navy
Ms. Madeline Rivera/Navy

Final - Response to Comments on Draft Background Investigation Work Plan For Eastern Vieques Technical Memorandum

This memorandum compiles the Navy's responses to all comments received on the *Draft Background Investigation Work Plan for Eastern Vieques Technical Memorandum* (Navy/CH2M HILL, October 28, 2004). For ease of review, each comment has been reproduced in **bold type**, followed by the Navy's response.

It is noted here that the *Draft Background Investigation Work Plan for Eastern Vieques Technical Memorandum* (Navy/CH2M HILL, October 28, 2004), hereafter referred to the "October 28 Tech Memo," was intended to clarify the background investigation approach, as discussed during the meeting held in EPA Region 2 office on September 28, 2004, and was not intended to replace the *Draft Final Work Plan and Sampling and Analysis Plan, Soil and Groundwater Background Investigation, Former Atlantic Fleet Weapons Training Facility, Vieques, Puerto Rico* (CH2M HILL, May 19, 2004), hereafter referred to as the Draft Final Work Plan. As such, based on discussions held during the March 8, 2005 Technical Subcommittee Meeting, the Draft Final Work Plan will be revised in accordance with the responses herein (including removal of groundwater as a media and organics as analytical parameters from the background investigation) and submitted as final, rather than re-submittal of a revised Technical Memorandum. The final work plan will be entitled *Final Work Plan and Sampling and Analysis Plan, Soil Background Investigation, Former Atlantic Fleet Weapons Training Facility, Vieques, Puerto Rico*, hereafter referred to as the Final Work Plan.

Environmental Protection Agency (EPA) Comments

- 1) **While the original intent of the Navy's background investigation proposal was to address the issue of whether or not exceedances of generic risk-based concentration (RBCs) values, such as the EPA Region IX "preliminary remediation goals" (PRGs), indicate a release of hazardous waste and/or hazardous constituents, is present at certain of the investigated SWMUs and AOCs, many commentors have recommended that the proposal be expanded to include a comprehensive screening of ambient background conditions in all environmental media, not just for soils and groundwater, as currently proposed. The Agency recommends that a separate proposal for establishing the ambient background conditions for media other than soil and groundwater be deferred until after the AFWTF facility is listed on the National Priorities List (NPL).**

The Navy wishes to clarify that the October 28 Tech Memo pertains to only background soil. The Navy concurs that evaluation of background conditions for other media (e.g., groundwater, sediment, and surface water) be deferred until a later date, and evaluated on a site-specific and as-needed basis, as noted in the October 28 Tech Memo. The site-specific approach for background investigations for these other media will be incorporated, as necessary, into work plans developed for RFI/RI investigations at specific AOCs/SWMUs.

- 2) **Since the scope of the current work plan is focused on determining whether or not a release of hazardous wastes and/or hazardous constituents has occurred at certain of the investigated SWMUs and AOCs, and not on establishing ambient background conditions in all environmental media, it should be entitled "Supplemental RFI Investigation Work Plan", rather than Background Investigation Plan.**

The Navy wishes to clarify that the scope of work described in the October 28 Tech Memo does not include determination of whether there have been releases of hazardous waste/hazardous constituents at SWMUs/AOCs. Rather, its purpose is to establish a set of data that is representative of background soil inorganics data at the facility. As such, the Navy purports that it is appropriately entitled a background investigation, recognizing that the background soil data will be used to help differentiate site-related inorganic constituent levels from background inorganic constituent levels.

- 3) **Also, the revised work plan should make clear that if a release of hazardous waste or hazardous constituents exceeding generic RBCs and natural background concentrations is determined to exist at any of those SWMUs or AOCs based on the results of that "Supplemental RFI Investigation Work Plan", then additional work will be required at those SWMUs and AOCs. Pursuant to Section VI.B.7 of the Order, such work could include development of:**

- A) **a "Full RFI Work Plan" to characterize: a) the potential pathways of contaminant migration; b) the source(s) of contamination; c) the degree and extent of contamination; and d) identify actual or potential human and/or ecological receptors and assess the risk to such receptors; and**
- B) **implementation of site-specific risk evaluations to determine whether or not the indicated releases pose unacceptable risks to human health and/or the environment.**

The Navy wishes to note that the comment above is not consistent with Consolidated Comment #1 below, which defines a process for assessing potential risks associated with site constituent concentrations that is independent of background concentrations. For site-specific risk assessments, comparison to background inorganics concentrations will be conducted after the quantitative risk assessment is completed, and background inorganics data will not be considered when selecting constituents for quantitative risk assessment. Following quantitative risk assessment, the background soil inorganics comparison will be conducted in accordance with *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (EPA, September 2002)) and others, as applicable, cited in Section 3 of the Draft Final Work Plan, and included in the risk assessment discussions and recommendations. Where site-specific inorganics concentrations are found to represent an unacceptable level of potential risk, and are found to be statistically higher than background inorganics concentrations as defined by EPA (September 2002), additional characterization, controls, or corrective action will be proposed. See Figures 1 and 2 (attached) for the decision analysis regarding the use of site-specific and background data.

Consolidated Comments

- 1) Any comparison of concentrations measured at specific solid waste management units (SWMUs) and areas of concern (AOCs) or other "sites" to background concentrations must be done independent of the human health risk assessment (HHRA). In the HHRA process, chemical concentrations are first screened against generic risk-based concentrations (RBCs). When there is an exceedance of the RBCs, the chemical is then carried into the quantitative risk assessment process. Comparison of concentrations at specific SWMUs/AOCs to background concentrations should be done after the HHRA, as part of risk management decisions, not before. The language in the workplan October 28 Technical Memorandum and the resultant work plan must be revised to more clearly state this process. (Also see comments number 8 and 14 below regarding the need to also evaluate whether or not unacceptable ecological impacts are posed).

With respect to the use of the background soil inorganics data as part of risk management decisions, the Navy concurs with the approach as described above. The use of site and background data, as part of the data flow process, is presented in Figures 1 and 2, attached to this memorandum.

- 2) The background sampling as proposed is to develop a data set for inorganic constituents in surface and subsurface soils. As discussed above, if unacceptable human health risk is indicated at a SWMU or AOC due to measured inorganic constituents in the surface or subsurface soils, the entire background data set for those soils (surface and subsurface) should then be compared to the data set for soil samples collected at that SWMU/AOC. If no statistically significant difference is observed between the concentrations of naturally occurring inorganic constituents measured in the data set at the individual SWMUs/AOCs and the entire background data set, then no release of those inorganic constituents is indicated.

It is the Navy's understanding that Region II does not combine surface soil data and subsurface soil data for the residential exposure scenario; rather, this scenario utilizes only surface soil for estimating potential risk. Based on this understanding, only the background surface soil data would be used in this comparison, unless the background surface soil data and subsurface soil data are statistically comparable, in which case they would be combined to generate a comprehensive background soil dataset for both surface and subsurface soil.

In addition to the above, combining surface and subsurface soil data can be done for the construction worker scenario, in which case the background surface and subsurface soil data would be combined for comparison.

- 3) The Navy's rationale for not wishing to use a more sensitive method detection limit for thallium is that this will result in data that cannot be combined with existing SWMU/AOC data for thallium. In fact, due to some of the SWMU/AOC sample results for thallium exceeding the thallium risk-based concentration level, the Navy should now use a more sensitive analytical method to fully define the natural thallium background concentrations. If the thallium detection limits for the background samples also exceed the corresponding PRG concentration, any

thallium background non-detect data may not be used to eliminate thallium as a constituent of concern at the SWMUs/AOCs. Whereas if the more sensitive detection levels are used in background and the data set confirms that the natural thallium background is above the PRG level, then at SWMUs/AOCs where non-detection of thallium were previously recorded using elevated detection levels, we can assume there are no thallium releases.

The methodology for thallium analysis proposed in the Draft Final Work Plan is SW-846 Method 6010B. This method is capable of achieving method detection limits (MDLs) that are below the adjusted PRG (i.e., 0.516 mg/kg), but may not be capable of achieving reporting limits (RLs) below the adjusted PRG. Although the MDL for all of the data analyzed as part of the RFI process has been below the adjusted PRG, the data collected in June 2000 were reported to the RL, which was above the adjusted PRG. All other RFI data were reported down to the MDL, which, as noted above, was below the adjusted PRG.

For the June 2000 data, it is recommended that the analytical laboratory revise the Form Is to report down to the MDL. This will either confirm non-detect data at the MDL (rather than the RL) or report detected concentrations that are below the adjusted PRG. In this way, all historic RFI data will be reported to MDLs that are below the adjusted PRG.

Based on the above information, it is proposed that future thallium analyses be accomplished using SW-846 Method 7814, Thallium, Atomic Absorption Furnace technique (GFAA). The GFAA analysis will be able to provide RLs that are consistently at or below the adjusted PRG. In addition, the original SW-846 analytical method will be continue to be performed on the samples to ensure any statistical comparisons of site data to background data will utilize consistent analytical methodologies, if necessary.

- 4) **The October 28 Technical Memorandum should indicate the general areas where background samples are expected to be collected.**

As noted above, the intent of the October 28 Tech Memo was to clarify the background investigation approach, not to replace Draft Final Work Plan. Proposed background soil sample locations are presented in Figures 2-4 and 2-5 of the Draft Final Work Plan. Note that the proposed background groundwater sampling locations will be removed in the revised figures for the Final Work Plan. Further, actual sample locations will be concurred upon during a site visit with the agencies.

- 5) **Please clarify when the "further statistical tests" will be run on the soil data set, and how the results of the statistical tests will be utilized. Please also expand the discussion of the usage of geochemical evaluations.**

The use of statistical tests is the same as that described in Section 3 of the Draft Final Work Plan. As an initial evaluation, and as agreed upon for the background investigation on western Vieques, point-to-point comparisons will be made utilizing the 95% UTL value of the background concentrations. Determination of applicable statistical tests will be made once the background data have been collected, and the tests will be conducted in accordance with the EPA and Navy guidance cited in

Section 3 of the Draft Final Work Plan. *The Guidance for Environmental Background Analysis, Volume I: Soil* (Naval Facilities Engineering Command, April 2002) will be added to the guidance referenced.

Application of statistical testing in accordance with EPA and Navy guidance is warranted even if the datasets (background and site-specific) are not entirely random. It is common practice to utilize judgmental sampling for environmental investigations. This practice, by design, is intended to identify and differentiate contaminated areas from uncontaminated areas. Specifically, site-specific sampling points are generally targeted to areas of known or suspected contamination, rather than areas known or suspected to be uncontaminated. Thus, a dataset for a given environmental site is likely biased high with respect to distribution and concentrations of constituents. Again, this is a common practice because it provides for a conservative estimate of potential risks.

With the understanding of what bias may exist for a dataset, use of statistical methods for comparison with background is generally warranted. For example, for typical environmental datasets (i.e., biased toward contaminated areas), statistical comparison to background data is warranted because this dataset will likely contain higher concentrations of constituents than a random dataset from the same site. In this case, a conservative estimate (i.e., more protective) of whether site concentrations are within background is produced. For any statistical or other comparative test performed, the rationale for and applicability of its use, as well as any qualifications, will be presented with the results.

Comparative geochemical and geotechnical evaluations that may be utilized include elemental ratio comparisons between background and site-specific constituents, comparison of soil characterization and classification, and comparison of other geochemical parameters (e.g., redox, pH, cation exchange capacity, TOC). This information will be added to the revised Work Plan.

- 6) The October 28 Technical Memorandum suggests that for groundwater, instead of establishing a regional background data set, site specific (i.e., SWMU/AOC specific) up gradient wells will be compared to downgradient wells using statistics. On a site-specific basis, only one or a few wells are installed to evaluate background groundwater quality for any given SWMU/AOC; therefore, it seems that the dataset will be limited. Please clarify what methods will be used to statistically analyze up gradient versus on-site groundwater quality. In addition to the guidance you cite, please also consult the EPA guidance *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* (EPA/530-SW-89-026) to determine if usage of the statistical procedures discussed in that guidance are applicable here.

As agreed to during the September 28, 2004 meeting at EPA Region 2, groundwater is to be eliminated from this background investigation.

- 7) Eliminating detected constituents as potential constituents of concern (PCOCs) based only on knowledge of site activities is not appropriate. It is not uncommon for the use or release of contaminants to have occurred, yet there is no

documentation that the contaminant was ever utilized in conjunction with past site activities.

The intent is not to eliminate constituents as COPCs solely by consideration of historical activities, and neither the October 28 Tech Memo nor the Draft Final Work Plan suggest this. However, historical activities are factors that may be considered when evaluating constituents identified and making risk management recommendations for the SWMUs.

- 8) **The Technical Memorandum and Background Work Plan must more clearly define what types of "quantitative risk assessment" will be conducted if contamination is found to be present at a SWMU/AOC site. Under both RCRA corrective action requirements and Superfund any final actions must evaluate whether or not there are unacceptable risks to both humans health and /or the environment.**

As noted above, the purpose of the background investigation is to establish a set of data that is representative of background soil inorganics data at the facility. No risk assessments will be conducted as part of the background investigation. Risk assessments will be/have been conducted for individual SWMUs/AOCs, as appropriate and in accordance with risk assessment protocol identified in their respective work plans.

- 9) **Some of the SWMs/AOCs being addressed under the RCRA Order are located along or in close proximity to drainage areas and/or the shoreline. As part of any final decision regarding the SWMUs/AOCs being addressed under the RCRA Order, the Navy should assess whether surface runoff pathways from those SWMUs/AOCs are present and if they represent potentially complete pathways for releases from the SWMUs/AOCs to impact to the coastal lagoons and mangrove swamp areas. As part of the revised Background Investigation Work Plan, the Navy should include an evaluation of whether surface runoff pathways from the SWMUs/AOCs being addressed under the RCRA Order are present and whether those represent potentially complete pathways for releases from the SWMUs/AOCs to impact to the coastal lagoons and mangrove swamp areas. If potentially complete runoff pathways are present, the revised Background Sampling Plan should include a discussion of whether sampling of sediment and surface water should be conducted, and a separate sampling plan for surface water and sediments needs to be developed that will indicate how surface water and sediments background sites will be determined, the proposed sampling and analytical methods, and the relevant screening criteria to be used. Also, the June 2004 *Draft Phase I RFI Final Report* (and possibly the February 2001 *Description of Current Conditions Report*) may need to be revised to indicate where surface runoff pathways from investigated SWMUs/AOCs represent potentially complete pathways for impacts to coastal lagoons and mangrove swamps.**

As noted in the response to EPA Comment #2, the purpose of the background investigation is to establish a set of data that is representative of background soil inorganics concentrations at the facility, not to make determinations of whether there have been releases of hazardous waste/hazardous constituents at SWMUs/AOCs. Separate investigations have been/will be conducted for individual SWMUs/AOCs

to evaluate whether site-specific releases have occurred. During these investigations, conceptual models are developed. If potential pathways are identified for release to surface water/sediment bodies, then sampling will be proposed in site-specific work plans to appropriately evaluate these pathways.

- 10) Several commenters have expressed concern with the proposed background soil sampling data set being used to eliminate from further evaluation certain Potential Areas of Concern (PAOCs) or Photo Identified (PIs) sites, as is indicated in the June 2004 *Draft Phase I RFI Report*. While the October 28 technical Memorandum states that sediment and surface water sampling may be necessary and will be collected on a site specific basis, there seems to be no commitment to do so at the present time. In fact the October 28 Technical Memorandum states that most of the environmental sites are not located in close proximity to surface water or sediments. Please clarify if that statement is only made with regard to the 12 SWMU and AOCs required investigated under the RCRA Order, though that is clearly not the case for SWMU 2, the Fuels Off-loading site. In fact, many of the PAOC and PI sites identified since the RCRA Order took effect, as well as much of the live impact are (LIA), are adjacent to, or located in a wetland or water body. Although not part of the current Background Investigation proposal, as part of the future work, sediment sampling may be required for many of these sites.

Please see response to Consolidated Comment #9. The Navy understands that surface water/sediment sampling may be appropriate at sites that are located adjacent to surface water bodies. Background and site-specific surface water and sediment sampling locations will be included, as appropriate, in work plans developed for those sites. The data collected during the soil background investigation will not be used to make these determinations.

- 11) In addition, although not part of the current Background Investigation proposal, if coastal lagoon and mangrove swamp sediment and surface water samples are proposed for investigation, EPA recommends that in order to determine if impacts to coastal lagoon and mangrove swamp are SWMU/AOC related, upstream locations along the identified surface runoff pathways should also be considered for sampling.

As noted in response to Consolidated Comments #9 and #10, site-specific sampling will be designed to adequately assess potential pathways identified in conceptual models for specific sites. If surface water/sediment are determined to represent a potential pathway, sediment/surface water sampling will be proposed, as appropriate.

- 12) To be consistent with future CERCLA procedures, background soil and groundwater samples should undergo a full TCL and TAL analysis (as opposed to the Appendix IX list of 40 CFR § 264).

The Navy concurs with this approach of analyzing data using CERCLA procedures. Given that this background investigation is for only inorganics in soils, all samples will be analyzed for TAL inorganics, which is what is stated in the October 28 Tech Memo. In addition, soil samples will be analyzed for thallium using SW-846 Method

7814, Thallium, Atomic Absorption Furnace technique (GFAA). The Draft Final Work Plan will be revised to reflect this.

- 13) **Although not part of the current Background Investigation proposal, if collected, sediment samples should undergo grain size and TOC evaluations, and for surface water samples, the hardness should be measured.**

If surface water/sediment sampling is deemed necessary for particular sites, the associated work plan(s) will propose the particular analytical protocol and associated rationale. If the parameters suggested above assist in evaluating potential releases, making background comparisons, and/or making risk management decisions, they will be included.

- 14) **Since the purpose of the National Wildlife Refuge System is for the conservation, management and restoration of fish and wildlife resources and their habitats, both the EPA Region 9 Preliminary Remediation Goals (PRG) for human health and appropriate Ecological Screening levels should be cited for all data comparison for data from the Vieques National Wildlife Refuge. The following is a list of recommended soil screening criteria, along with the source of the list, and the web address for accessing them:**

USEPA:

Ecological Soil Screening Level (Eco-SSL) Guidance and Documents
www.epa.gov/oerrpage/superfund/programs/risk/ecorisk/ecossl.htm

Oak Ridge National Laboratory:

R. Efroymson, M. Will, and G. Suter II. 1997. Toxicological Benchmarks for Contaminants of potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Processes: Oak Ridge National Laboratory, Oak Ridge TN. ES/ER/TM-126/R2.
http://www.esd.ornl.gov/programs/ecorisk/benchmark_reports.html

R. Efroymson, M. Will, G. Suter II, and A. Wooten. 1997. Toxicological Benchmarks for Screening contaminants of Potential concern for Effects on Terrestrial Plants: 1997 Revision. Oak Ridge National Laboratory, Oak Ridge, TN. ES/ER/TM-85/R3
http://www.esd.ornl.gov/programs/ecorisk/benchmark_reports.html

Canada

Canadian Environmental Quality Guidelines, Environment Canada
www.ec.gc.ca/ceqg-rcqe/

The Netherlands:

T. Crommentuijn, M Polder, and E. van de Plasshe. 1997. Maximum Permissible Concentrations and Negligible Concentrations for Metals, Taking Background Concentrations into Account. Nat. Inst. Public Health and the Environ., Bilthoven, The Netherlands. RIVM Report 601501 001.

<http://www.rivm.nl/bibliotheek/rapporten/601501001.html>

As noted previously, the intent of this background study is not to make determinations of potential releases at specific sites. Comparisons to site-specific data and determinations of potential releases will be made in site-specific reports, during which appropriate risk-based criteria will be utilized. These criteria are/will be proposed in site-specific work plans.

- 15.) **In selecting the proposed background sample location, accessibility to a site should not be a selection criterion. Much of the dense scrub and vegetation may be mesquite or other such invasive exotic species, and the Fish & Wildlife Service (F&WS) may not be opposed to clearing those invasive exotic species for an access road and area for sample collection. However, prior to any such clearance, vegetation would need to be evaluated by a qualified individual prior to clearing. Given the current F&WS Refuge workload, the F&WS has indicated that the Navy consider contracting or hiring a site biologist for all future actions on Vieques.**

The purpose of the background sampling program is to provide sufficient data to establish representative background concentration data for inorganics that occur throughout the former Atlantic Fleet Weapons Training Facility, but that are not indicative of contaminants resulting from releases at a particular site. Here, "representative" means a sample set that is typical of the population being sampled.

With the selection of a background data set, choosing locations requires screening out areas of suspected release and identifying the physical characteristics of the chosen background locations relative to those of the investigative areas. It is important to emphasize that the background sample locations need to be chosen to be representative of the target population (i.e., background in this case), which does not require an indiscriminate form of randomness be applied to identifying the locations.

In identifying these representative locations, areas of potential environmental or munitions related contamination have been screened out. Within the remaining area, locations have been proposed that are outside known or suspected areas of influence by human activity, but are also economically accessible.

The validity of the background locations will be reinforced by invited review of the proposed sample locations by EPA, PREQB, and DOI prior to sample collection and by documentation of the geologic units and other physical characteristics of sample locations. All proposed background sample locations will be a minimum of 100 feet away from roads in undisturbed areas of vegetation and away from mowed and maintained areas to minimize the potential to detect constituent concentrations resulting from vehicular traffic along the roadways. Figures 2-4 and 2-5 of the Draft Final Work Plan will be revised, as necessary, to ensure meeting the criteria discussed in this response. Further, actual sample locations will be concurred upon during a site visit with the agencies.

- 16.) **If the selected background sampling areas that are currently accessible (i.e. easy to walk into), are suspect of recent anthropogenic disturbance and may not represent "natural" conditions. We recommend that a large suite of potential sample**

locations be identified, and then be visually screened to confirm there are no visual signs of anthropogenic impacts. The final sample locations can then be randomly selected from the suite of sites exhibiting no visual signs of anthropogenic impacts.

The Draft Final Work Plan discusses the approach to select background soil locations. As noted above, it states that the proposed locations will be a minimum of 100 feet away from roads in vegetation, and away from mowed and maintained areas to prevent detection of potential contamination resulting from vehicular traffic along the roadways. It also states that in order to obtain concurrence on background sample locations among the technical stakeholders, a site visit is proposed for the technical representatives from the Navy, EPA, DOI, and PREQB to inspect the 29 proposed soil sample locations. Figures 2-4 and 2-5 will be revised to include several contingency locations that may be used if visual inspection during the site visit identifies potential anthropogenic impacts at any of the proposed locations.

- 17.) **At the September 28, 2004 meeting it was generally accepted that the analysis of explosives, pesticides and/or most organic constituents in the background investigations was not appropriate since those parameters could not be considered to be natural occurring concentrations. However, measuring the concentrations of such parameters in the background samples could be useful in determining whether or not the soils at a background site are impacted waste or munitions related releases. If explosives, pesticides, and organic constituents are confirmed to not be present in a background sample, that would provide evidence that the background sample location has not impacted by releases, i.e., that it is representative of natural conditions.**

Considerable discussion has taken place with respect to the analytical protocol for background sampling. Until concurrence is reached regarding how non-inorganics data can be considered with respect to background, it is proposed that the background investigation be limited to inorganics, as agreed to during the September 2004 meeting. In addition, both the October 28 Tech Memo and the Draft Final Work Plan state that to assess if any of the soil samples have been potentially impacted by munitions sites or environmental contamination, statistical outlier tests will be conducted using the methods identified in EPA Guidance. Results that are statistically shown to be outliers will be eliminated from consideration as representative of background.

- 18.) **It is important to be able to relocate the background sampling locations after they had been sampled. The work plan should include a discussion of how the coordinates of the background sample locations will be determined (either be surveyed or GPS coordinates) and recorded.**

GPS surveying will be utilized to locate each background sampling point, unless vegetation obscures the satellite signal. In this case, a licensed surveyor will be contracted to survey those locations where GPS surveying is unsuccessful. The Draft Final Work Plan will be revised to reflect this information.

- 19.) **It is important to have procedures to adequately describe the background soil boring in terms of soil characteristics (i.e. color, grain type, soil horizon, presence**

of fill, evidence of contamination, odors). Also, it is important to have procedures to adequately describe the relationship between the soil sample locations and potential contaminant sources such as roads, buildings, drainage ditches, photo identified sites. The work plan should include a discussion of how both types of information will be gathered and recorded.

Standard Operating Procedures for describing soil characteristics are contained in Attachment 2 - Standard Operating Procedures, SOP Logging of Soil Borings - Page 4.5-1 through 4.5-6 of the *Final Master Work Plan, Atlantic Fleet Weapons Training Facility, Vieques, Puerto Rico* (CH2M HILL, June 12, 2003). These Standard Operating Procedures are referenced in Section 4.1.2.1 of the Draft Final Work Plan

Pertinent information such as the relationship between soil sample locations and potential contaminant sources such as roads, buildings, drainage ditches, photo identified sites are recorded on each boring log. This clarification will be added to Section 4.1.2.1 of the Draft Final Work Plan.

- 20.) **All background soil samples should be evaluated for Total Organic Carbon and pH. This data may be needed to assist in subsequent fate and transport assessments.**

As noted in the response to Comment #5, pH and TOC will be added to the background soil analytical protocol.

- 21.) **The work plan must include an acceptable QA/QC program to confirm the validity of the background analytical data.**

The Navy concurs with this comment. As stated in Section 4 of the Draft Final Work Plan, the approved Master Quality Assurance Project Plan, which is contained within the *Final Master Work Plan, Atlantic Fleet Weapons Training Facility, Vieques, Puerto Rico* (CH2M HILL, June 12, 2003), will be followed during the background study investigation.

- 22.) **The Statistical Analysis section of the Technical Memorandum indicates that background samples may inadvertently be collected from areas which have been impacted by past waste and/or munitions activities. If elevated concentrations in background samples are to be eliminated from the background data set if identified as outliers resulting from past waste and/or munitions activities, the Technical Memorandum and Background Work Plan should include a discussion of what actions would be triggers to assess if such outlier locations found in the background data set are the result of past waste or munitions-related releases.**

The Draft Final Work Plan will be revised to state that a discussion of outliers will be included in the background investigation report. The discussion will identify and discuss all outliers. For outliers that are found not to indicate natural innate variability (through statistical analysis per EPA guidance), recommendations will be made regarding the need for additional evaluation of area(s) where samples containing the outlier data were collected.

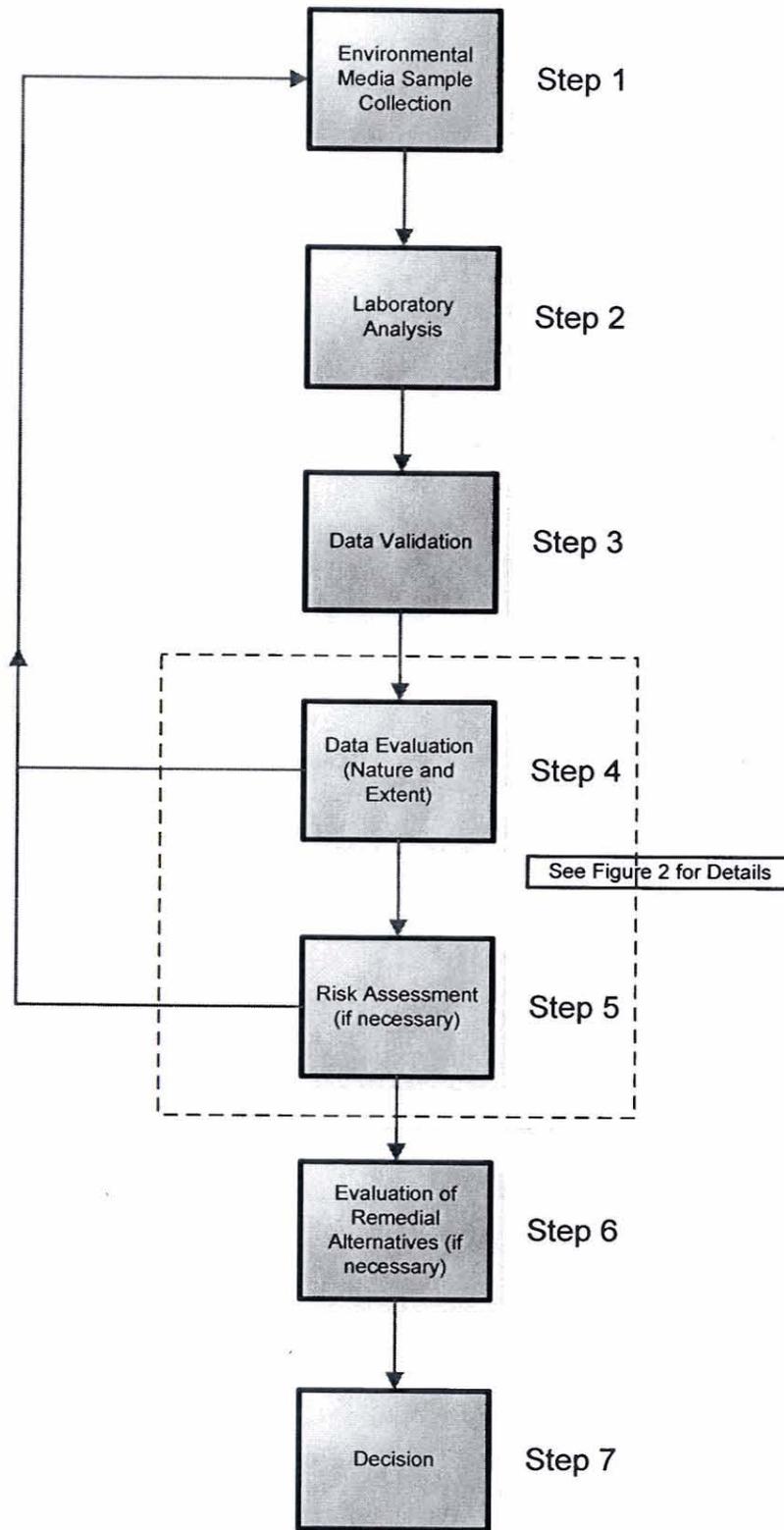


Figure 1
General Schematic of Data Flow Steps

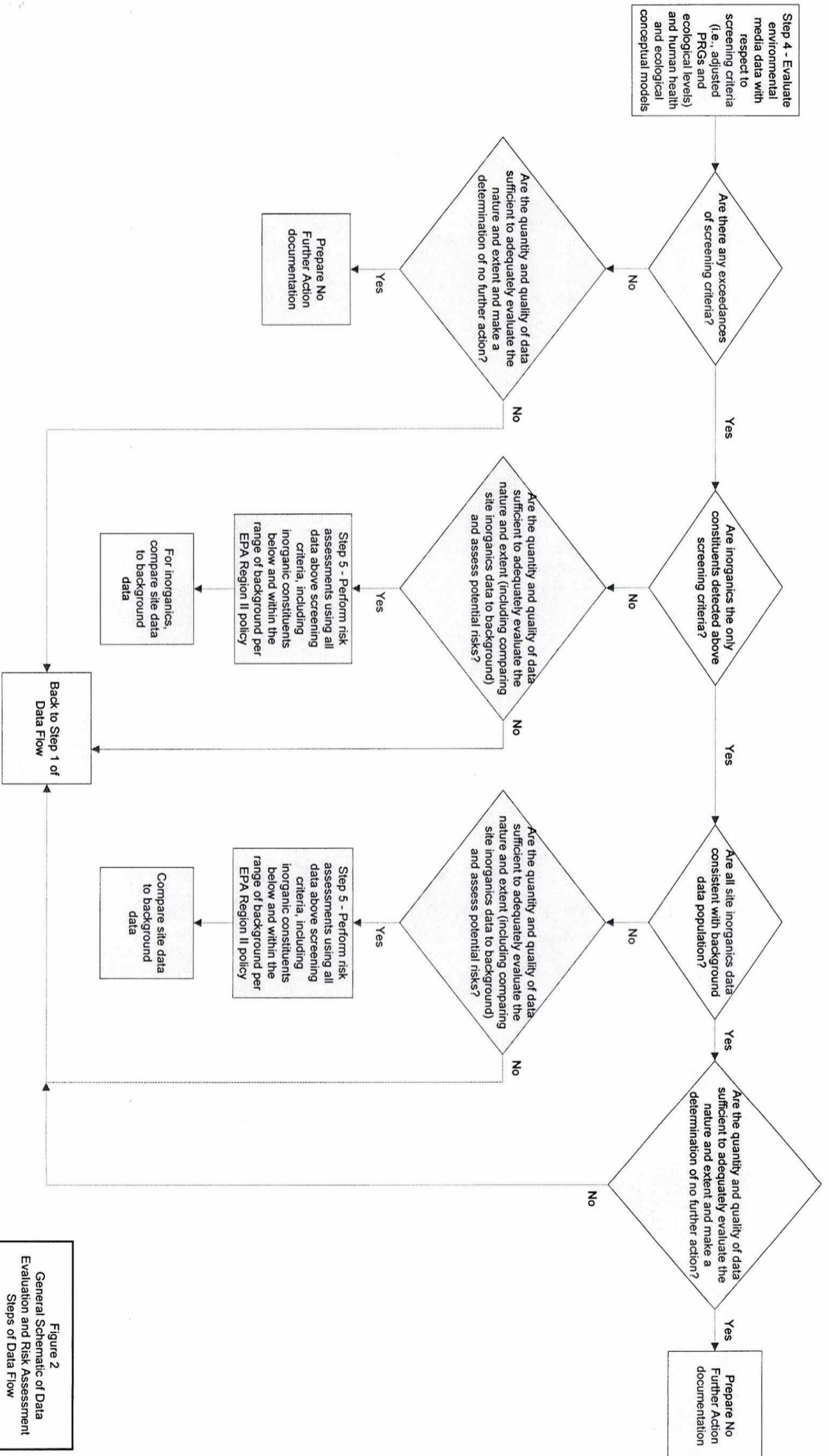


Figure 2
 General Schematic of Data Evaluation and Risk Assessment Steps of Data Flow