



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 2  
290 BROADWAY  
NEW YORK, NY 10007-1866

JUN 17 2011

CERTIFIED MAIL  
RETURN RECEIPT REQUESTED

Mr. Mark E. Davidson  
US Navy  
BRAC PMO SE  
4130 Faber Place Drive  
Suite 202  
North Charleston, SC 29405

Re: Naval Activity Puerto Rico (NAPR), formerly Naval Station Roosevelt Roads,  
EPA I.D. Number PRD2170027203

- 1) SWMU 7/8 (Tow Way Fuel Farm) – Draft Work Plan for Monitored Natural Attenuation Sampling, dated February 28, 2011
- 2) SWMU 67 (Former Gas Station) – Final Phase I RFI Report, dated June 2, 2011

Dear Mr. Davidson:

This letter is addressed to you as the Navy's designated project coordinator pursuant to the January 29, 2007 RCRA Administrative Order on Consent ("the Consent Order") between the United States Environmental Protection Agency (EPA) and the U.S. Navy (the Navy).

SWMU 7/8 – Draft Work Plan for Monitored Natural Attenuation (MNA) Sampling

EPA has completed its review of the above document, which was submitted on behalf of the Navy by Mr. Tom Biesel's (of AGVIO/CH2M Hill) letter of February 28, 2011. As part of that review, EPA requested our consultant, TechLaw Inc., to review this document. TechLaw's comments are given in the enclosed Technical Review, dated June 2, 2011 (Enclosure #1).

Within 60 days of your receipt of this letter, please submit revisions to the MNA Sampling Work Plan which acceptably address the comments given in the enclosed Technical Review.

In addition, the Puerto Rico Environmental Quality Board (PREQB) has reviewed the MNA Sampling Work Plan and had comments on it, which are attached with their letter dated May 16, 2011 to myself. A copy is enclosed (Enclosure #2). Within 60 days of your receipt of this letter, please also submit revisions to the MNA Sampling Work Plan to address PREQB's comments.

SWMU 67 (Former Gas Station) - Final Phase I RFI Report, dated June 2, 2011

EPA has completed its review of the Final Phase I RFI report, and the Navy's responses to EPA's comments on the draft Phase I report, given with our letter of February 24, 2011. Both items were submitted on behalf of the Navy by Mr. Mark Kimes' (of Michael Baker, Inc., your consultant) letter of June 2, 2011. EPA hereby approves the Final Phase I RFI report, and the Navy's responses to EPA's comments. EPA concurs with the recommendation given in the Responses to Comments and Section 7.2 of the Final Phase I RFI report, that a Full RFI is needed to characterize the nature and extent of indicated releases to surface and subsurface soils, and groundwater and estuarine sediments. In addition, EPA hereby approves a delay in submission of the draft Full RFI Work Plan until October 31, 2011, as requested in your letter of May 26, 2011.

If you have any questions, please telephone me at (212) 637- 4167.

Sincerely yours,



Timothy R. Gordon  
Project Coordinator  
Corrective Action and Special Projects Section  
RCRA Programs Branch

Enclosures (2)

cc: Ms. Wilmarie Rivera, P.R. Environmental Quality Board, w/encl. #1  
Ms. Gloria Toro, P.R. Environmental Quality Board, w/encl. #1  
Mr. Tom Biesel, AGVIO/CH2M Hill, w/encls.  
Mr. Mark Kimes, Baker Environmental, w/encls.  
Ms. Cathy Dare, TechLaw Inc. w/o encls.  
Mr. Felix Lopez, USF&WS, w/o encls.

**REVIEW OF THE WORK PLAN  
MONITORED NATURAL ATTENUATION  
GROUNDWATER SAMPLING AT SWMU 7/8  
DATED FEBRUARY 2011**

**NAVAL ACTIVITY PUERTO RICO  
CEIBA, PUERTO RICO  
EPA ID No. PR2170027203**

**Submitted to:**

**U.S. Environmental Protection Agency  
Region 2  
290 Broadway  
New York, NY 10007-1866**

**Submitted by:**

**TechLaw, Inc.  
205 West Wacker Drive  
Suite 1622  
Chicago, Illinois 60606**

<b>EPA Task Order No.</b>	<b>002</b>
<b>Contract No.</b>	<b>EP-W-07-018</b>
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**June 2, 2011**

**REVIEW OF THE WORK PLAN  
MONITORED NATURAL ATTENUATION  
GROUNDWATER SAMPLING AT SWMU 7/8  
DATED FEBRUARY 2011**

**NAVAL ACTIVITY PUERTO RICO  
CEIBA, PUERTO RICO  
EPA ID No. PR2170027203**

The following comments were generated based on a technical review of the *Work Plan for Monitored Natural Attenuation, Groundwater Sampling at SWMU 7/8*, dated February 2011 (Work Plan), for the Naval Activity Puerto Rico facility in Ceiba, Puerto Rico. TechLaw also reviewed Appendix A, the UFP-SAP (SAP) of the Work Plan for overall completeness and compliance with the *Uniform Federal Policy for Quality Assurance Project Plans*, dated March 2005 (UFP Manual).

**GENERAL COMMENT**

1. Section 1 of the Work Plan is confusing with regard to the history of delineation of light non-aqueous phase liquids (LNAPLs) and dissolved contaminants in the uppermost aquifer at the Tow Way Fuel Farm. Specifically, Figure 1-11, Corrective Measures Study Assumed Extend of Dissolved Contaminant Plume, shows a very small contaminant plume in the southwestern portion of the Tow Way Fuel Farm in 2005. In contrast, Figure 1-4, Historical Extent of LNAPL, shows a very large extent of NAPL as measured three years later in 2008. While the area containing the dissolved plume coincides with the westernmost portion of the LNAPL plume, it is not clear why dissolved contamination was not detected throughout the remainder of the LNAPL plume (i.e., dissolved plume not present, or not sampled). Finally, Figure 1-12, MNA Monitoring and Recovery Well Locations with LNAPL Thickness (April 9, 2010), shows a smaller accumulation of LNAPL than that shown in Figure 1-4, two years earlier. Again, it is unclear if the reduction in the LNAPL footprint in 2010 is a result of LNAPL removal from the recovery well system, LNAPL mass reduction due to in-situ attenuation mechanisms, an artifact of the wells utilized in the 2010 monitoring program, or a combination of these factors. It is also unclear why the current day (2011) assumed extent of dissolved contamination is still the 2005 footprint, and why a revised dissolved contaminant footprint has not been mapped. Given these disparities, there appears to be very little correlation between the measured LNAPL and detected dissolved phase contaminants in the uppermost aquifer, and more importantly, it raises the question whether the current extent of dissolved contamination is sufficiently delineated to gather meaningful data to determine the efficacy of monitored natural attenuation (MNA) as a viable remedial alternative. Revise Section 1 of the Work Plan to provide a better description of the historical understanding of the interrelationship between the dissolved contaminant plume and LNAPL footprint, and provide the most recent mapping of the dissolved contaminant plume so the proposed MNA data interpretation will be meaningful and defensible.

2. The SAP refers to the well network proposed for sampling to evaluate MNA as tentative on several occasions. For example, Worksheet #17 (Sampling Design and Rationale) indicates that the “tentative sampling locations” are shown in Figure 10. It is unclear if the proposed well network for groundwater sampling will be altered at a later date, and what would cause this change. Revise the SAP to clarify if the well network may be changed, and if so, what would cause this change.
3. The SAP indicates that the geochemical parameters total arsenic and total manganese were added to the analyte list and will be analyzed for a minimum of four quarterly events in seven wells. The decision process for the sampling frequency and for selecting the seven wells to be sampled and analyzed for these two metals has not been provided. Revise the SAP to discuss why the sampling frequency was selected for total arsenic and total manganese and the rationale for the selection of the seven wells that will be sampled for these analytes. Also, explain why manganese is being sampled at a different frequency than other MNA parameters.
4. The SAP is not clear about how the data will be reported. For example, Worksheet #11 indicates that for each sampling event, a letter report containing the environmental data and maps showing the extent of contamination will be prepared and submitted to PREQB, and then a technical memorandum containing a summary of results and recommendations will be submitted to stakeholders. Worksheet #14 indicates that reports will be submitted after baseline testing and at the conclusion of quarters 4 and 8. It is unclear why two separate reports will be prepared for each event as discussed in Worksheet #11 and how these reports relate to the reports discussed in Worksheet #14. Further, Worksheet #33 (QA Management Reports Table) indicates that a QA Management Report will be submitted with a technical memorandum for each sampling event; however, a QA Management Report is not identified for inclusion in the groundwater sample reports discussed in Worksheet #14. Revise the SAP to consistently discuss the frequency and content of the reports and ensure that QA Management Reports will be included in the groundwater sample reports.

## **SPECIFIC COMMENTS**

1. **Section 1.3, MNA Well Selection, Page 1-2:** The first paragraph in this section states “. . . 27 wells were selected to be included in the MNA study. None of the 27 wells selected have measurable LNAPL as shown on Figure 1-12.” However, Figure 1-12, MNA Monitoring and Recovery Well Locations with LNAPL Thickness (April 9, 2010) only shows 26 monitoring wells as part of the MNA monitoring network. Revise Figure 1-12 to include missing monitoring well location CHMW09. This comment also applies to Figure 10 in the SAP.
2. **Section 2.1.3, Dissolved Contaminant Plume Groundwater Investigation, Page 2-2:** The first paragraph in this section states that water quality samples will be collected quarterly for 2 years to “evaluate changes in dissolved volatile organic compound (VOC) concentrations and calculate attenuation rates as a result of LNAPL removal and MNA.” It may be difficult to determine in such a short time period (2 years) whether a significant reduction in dissolved contaminant concentrations is the result of MNA, mass removal, or both. Given this, the calculated attenuation rates (which are essential for calculation and prediction of biological remediation timeframes) may be erroneous and skewed due to mass removal. Revise the Work Plan to discuss how these interferences will be accounted for.

3. **Section 3.3, Well Gauging and Groundwater Sampling and Analyses, Groundwater Sampling Procedures, Page 3-7:** The subsection on Groundwater Sampling Procedures does not indicate the type of tubing that will be used to purge and sample the groundwater at SWMUs 7 and 8. Section 3.1 indicates that samples will be collected in accordance with the EPA Region 4's Science and Ecosystems Support Division (SESD) *Field Branches Quality System and Technical Procedures*. However, Work Plan Section 4.0, Waste Management Plan, Page 4-1 indicates that "used plastic tubing" will be an investigation-derived waste. It should be noted that EPA Region 4's SESD *Field Branches Quality System and Technical Procedures*, Section 2.1, Volatile Organic Compounds (VOC) Analysis, of (SESDPROC-301-R1, Page 11 of 30) states "Samples for VOC analysis must be collected using either stainless steel or Teflon® equipment" and "submersible pumps used for sampling should be equipped with Teflon® sample delivery tubing." Revise the Work Plan to ensure that Teflon® tubing is used for the groundwater sampling activities at SWMUs 7 and 8 instead of plastic tubing.
4. **SAP Worksheet #6, Communication Pathways, Page 18:** The procedure for the Navy Remedial Project Manager (RPM) states, "Navy RPM to report any significant corrective actions to the involved regulatory agencies, unless otherwise directed by the Navy RPM to AGVIQ-CH2M HILL PM." It is unclear why significant corrective actions would not be reported to regulatory agencies. Revise this statement to clarify that all significant corrective actions will be reported to the regulatory agencies.
5. **SAP Worksheet #12, Measurement Performance Criteria Table – Field QC Sample, Page 46:** The table does not include the collection of matrix spike and matrix spike duplicate (MS/MSD) samples. These additional field samples are discussed as quality assurance (QA)/quality control (QC) samples in Worksheet #11. Revise this table to include the collection of MS/MSD samples.
6. **SAP Worksheet #12, Measurement Performance Criteria Table – Field QC Sample, Page 46:** This table provides the measurement performance criteria for groundwater samples, but does not include the measurement performance criteria for the soil and water waste characterization samples. Revise this table to include the soil and water waste characterization samples and the associated measurement performance criteria.
7. **SAP Worksheet #14, Summary of Project Tasks, Equipment Decontamination, Page 57:** Step number 5 in the decontamination procedure indicates that the last decontamination rinse will be completed with de-ionized water. However, Section 3.4, Sampling Equipment used for the Collection of Trace Organic and Inorganic Compounds, of EPA Region 4's SESD *Field Branches Quality System and Technical Procedures* Field Equipment Cleaning and Decontamination SOP (SESDPROC-205-R1, Page 11 of 14) indicates that the last decontamination rinse should be performed with "organic-free water" instead of deionized water. Revise the Work Plan to ensure that organic-free water is the last decontamination solution used to rinse the sampling equipment at the conclusion of the decontamination process.

8. **SAP Worksheet #14, Summary of Project Tasks, Groundwater Sample Reporting, Pages 59 and 60:** The Groundwater Sample Reporting bullets shown on Worksheet #14 Pages 59 and 60 do not indicate that the vertical extent of contamination will be determined for 1,2,4-Trimethylbenzene, benzene, and ethylbenzene, and it is not clear what data reporting procedures will be used for the MNA evaluation report (as discussed in the last paragraph on Page 60). The MNA evaluation report should present the full vertical and horizontal extent of contamination for all COCs, as well as isoconcentration maps of all electron acceptors, metabolic byproducts, and groundwater geochemical parameters. In addition, statistical analyses of COC concentrations in each well and along the downgradient flow path of the plume should be conducted. Revise the Work Plan to incorporate all of the reporting requirements discussed in this comment.
9. **SAP Worksheet #18, Sampling Locations and Methods/SOP Requirements Table, Page 80:** The grab samples to be collected for VOC analysis for waste characterization discussed in Worksheet #14 have not been included in these tables. Revise this table to include the grab samples that will be analyzed for VOCs.
10. **SAP Worksheet #24, Analytical Instrument Calibration Table, Pages 99 to 102:** The table in this worksheet does not include the tuning requirements for the analytical instruments. However, instrument tuning requirements should be specified in the SAP. Revise the SAP to provide this information.
11. **SAP Worksheet #28, Analytical Instrument Calibration Table, Pages 113 to 114:** This table does not indicate that a post digest spike (PDS) will be analyzed as discussed in SOP 105 (Metals by ICP-AES Technique). Revise this table to indicate that a PDS will be analyzed if the MS/MSD sample is outside the acceptance criteria.

#### **MINOR COMMENT**

1. Worksheet #10 of the SAP indicates that eDATapro will provide third party validation for ten percent of the analytical data; however, this company has not been included in the distribution list (Worksheet #3), the project organizational chart (Worksheet #5), the validation process table (Worksheet #35), or the analytical data validation summary table (Worksheet #36). Revise the SAP to include eDATapro in the appropriate worksheets.



COMMONWEALTH OF PUERTO RICO  
Office of the Governor  
Environmental Quality Board



Encl. # 2

ENVIRONMENTAL EMERGENCIES RESPONSE AREA

May 16, 2011

Timothy Gordon  
US Environmental Protection Agency – Region II  
290 Broadway – 22<sup>nd</sup> Floor  
New York, New York 10007-1866

**Re: Technical Review of the Monitored  
Natural Attenuation Groundwater  
Sampling Work Plan for SWMUs 7 & 8  
Tow Way Fuel Farm  
Naval Activity Puerto Rico  
Ceiba, PR2170027203**

Dear Mr. Gordon:

The Federal Facility Coordinator (FFC) and the Hazardous Wastes Permits Division (HWPD) has finished the review of the above-mentioned document. Our comments are provided in the attachment.

If you have any additional comments or questions please feel free to contact Gloria M. Toro Agrait at (767) 787-8181 extension 3586 or myself at extension 6129.

Cordially,

Wilmarie Rivera  
Federal Facilities Coordinator  
Environmental Emergencies Response Area

cc. Gloria M. Toro Agrait, Environmental Permits Officer

**Technical Review of the Monitored Natural Attenuation  
Groundwater Sampling Work Plan  
SWMUs 7/8 – Tow Way Fuel Farm  
US Naval Activity Puerto Rico, Ceiba, Puerto Rico  
February 28, 2011**

The Navy's responses to PREQB's Evaluations of the Navy's responses to PREQB's comments on the Draft Monitored Attenuation Work Plan are accepted, with the exception of the following comment responses, which require additional information or clarification.

1. PREQB General Comment 1: Please provide an updated figure to show the extent of free-phase LNAPL, as Figure 1-4 shows the historic extent of free-product. Figure 1-6 shows the groundwater piezometric surface as determined based on April 2010 measurements. It would be appropriate to utilize the data obtained during that round of measurements to depict an updated view of the extent of free-phase LNAPL. Also, please consider including the latest dissolved plume mapping [as included in the sampling and analysis plan (SAP)] in the work plan itself to aid the reader in understanding the rationale behind the choice of the 27 wells that will be monitored.

*Navy Response: A new figure and table have been added to Section 1.1.1, Site History, providing the reviewer the ability to evaluate the distribution and thickness of LNAPL at SWMUs 7/8. LNAPL thickness and spatial distribution as measured on April 9, 2010 are shown on Figure 1-7, SWMUs 7/8 LNAPL Thickness (April 2010). The summary of groundwater elevations and LNAPL thickness (April 9, 2010) are presented in Table 1-1, Summary of Groundwater Elevations - April 9, 20 10.*

*In addition, a new Section 1.3, MNA Well Selection has been added to the Work Plan to aid in the understanding of how the MNA wells were selected, what their associated well Construction details are, and where they are located . The text for this new section is shown in EPA General Comment 1.*

**PREQB Evaluation of Response:** Table 1-3, which provides the construction details for the wells chosen for the MNA monitoring program, indicates that the well screen lengths vary from 10 feet to 40 feet. Please clarify how data will be used/evaluated in light of the fact that the samples collected will represent a variety of conditions (i.e., the samples collected from wells with long screen lengths are subject to more dilution than those collected from wells with 10-foot screen lengths).

2. PREQB Page-Specific Comment 2, Page 1-4, Section 1.3: Please note that benzene and ethylbenzene have State and Federal Maximum Contaminant Levels (MCLs) that are applicable, relevant and appropriate requirements (ARARs) for groundwater that is considered potable. The 2010 update to PREQB's Water Quality Standard Regulations made all groundwater potable (refer to Section 1302.3 of the regulation). Therefore, please clarify

what actions will be taken to meet MCLs and an acceptable hazard level (in the case of 1,2,4-trimethylbenzene) for COCs in groundwater classified as potable.

*Navy Response: As stated in the 2005 CMS, the remedial action objective (RAO) for groundwater is to reduce concentrations of the three COCs (1,2,4-trimethylbenzene, benzene, and ethylbenzene) to their respective CAOs through MNA. The CMS indicated that if COCs exceed the CAOs after 2 years of monitoring the Navy will reevaluate alternative remedial technologies to enhance contaminant degradation and/or to use a risk-based approach to calculate alternate CAOs that are protective of human health and the environment.*

**PREQB Evaluation of Response:** PREQB acknowledges that the CAOs were developed prior to the recent revision of the PRWQS, which classifies groundwater as potable. Please note that concurrence with site closure decisions will be based on whether a cleanup action complies with ARARs. Therefore, please clarify the path forward for complying with this ARAR.

3. **PREQB Page-Specific Comment 6a, Pages 2-2 to 2-3, Table 2-1:** Please consider adding carbon dioxide and ferric iron analyses to the list of parameters and collecting MN parameters in all quarterly sampling and analysis events. This frequency will provide information sufficient to evaluate trends and temporal changes that may be occurring.

*Navy Response: Total dissolved iron will be included as a MNA parameter and has been added to Table 2-1. The measure and evaluation of CO2 is more appropriate and useful for chlorinated solvents than fuel hydrocarbons. The parameters currently presented in the Work Plan are better indicators for MNA; therefore, CO2 will not be included as an MNA parameter. MNA parameters are currently collected yearly and the COCs collected quarterly. Since this is an old spill, groundwater geochemistry does not change much from season to season. MNA parameters are being collected to demonstrate that conditions exist for biodegradation and not as an ongoing monitoring requirement. However, the COCs are being monitored quarterly to provide data concerning the movement of the plume based upon seasonal variations. No changes will be made to Table 2-1 concerning groundwater sampling frequency.*

**PREQB Evaluation of Response:** The response indicates that "total dissolved" iron will be included as a MNA parameter. Please clarify if the analyses will be for both total and dissolved iron or just dissolved iron and correct all references to "total dissolved" iron in the Work Plan and UFP SAP to ensure this is clear to all parties. Also, total manganese, and dissolved iron are being added to the analytical program to address both EPA and PREQB comments. Please revise the UFP SAP as follows: Worksheet #12: Include field duplicates for the analyses of total manganese and dissolved iron. Worksheet #28: Include rows for the analyses of total manganese and dissolved iron.