



COMMONWEALTH OF PUERTO RICO
Office of the Governor
Environmental Quality Board

Environmental Emergencies Response Area

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August 10, 2009

Mr. Kevin Cloe, P.E.
Remedial Project Manager
Commander Atlantic Division
Naval Facilities Engineering Command
6506 Hampton Boulevard
Norfolk, VA 23508-1278

RE: Draft In-Situ Remediation Pilot Studies (AOC E and AOC I Sites) Sampling and Analysis Plan, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

Dear Mr. Cloe:

The Puerto Rico Environmental Quality Board (PREQB) has completed its review of the Draft In-Situ Remediation Pilot Studies (AOC E and AOC I Sites) Sampling and Analysis Plan, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico, dated June 2009. Enclosed our comments.

Please contact me at (787) 767-8181 X.6141 if you have any questions or comments about our review.

Cordially,

Wilmarie Rivera
Federal Facilities Coordinator

cc: Daniel Rodríguez - EPA
Richard Henry - FWS
Daniel Hood - Navy
Christopher Penny - Navy

PREQB Comments
Draft In-Situ Remediation Pilot Studies (AOC E and AOC I Sites) Sampling and
Analysis Plan, Former Naval Ammunition Support Detachment, Vieques,
Puerto Rico, June 2009

I. General Comments

The following discrepancies between the approach discussed in the Pilot Study Technical Memorandum for AOC E (December 2008) and this Sampling and Analysis Plan (SAP) were identified. Please clarify why the identified changes were made.

- i) The Technical Memorandum stated that the confirmatory soil samples would be analyzed for VOCs, SVOCs, TPH, and nitrate. However, the SAP calls for these soil samples to be analyzed for select VOCs, select SVOCs, SPLP VOCs, SPLP SVOCs, TOC, pH and nitrate. It appears that TPH has been eliminated from the program.
- ii) The Technical Memorandum called for groundwater sampling 3 months after the first ISCO treatment for COCs (benzene, naphthalene, MTBE), sulfate, nitrate, soluble iron, and soluble manganese. According to the SAP Worksheet #16, the Project Schedule, only field parameters and persulfate will be analyzed for 3 months after first ISCO treatment.
- iii) The Technical Memorandum called for groundwater sampling 3 months after the second ISCO injection for COCs (benzene, naphthalene, MTBE), sulfate, nitrate, soluble iron, soluble manganese as well as field parameters. According to the SAP, Worksheet #16, no sampling is being performed 3 months after the second ISCO injection; instead this is being done 7 months after the second ISCO injection (unless a third ISCO injection is being performed and then field parameters only being measured 3 months after the second ISCO injection). Also, it is unclear how it will be determined if a third ISCO treatment is needed without sampling groundwater for the COCs and comparing the concentrations to threshold values on page 34 of Worksheet #10.
- iv) The Technical Memorandum called for groundwater sampling 3 months after the third ISCO treatment for COCs (benzene, naphthalene, MTBE), sulfate, nitrate, soluble iron, soluble manganese as well as field parameters. According to the SAP, Worksheet #16, no sampling is being performed 3 months after the third ISCO treatment; instead this is being done 7 months after the third ISCO injection.
- v) The Technical Memorandum called for deployment of socks 7 months after the last ISCO injection. According to Worksheet #16, deployment of the socks will occur 11 months after the last ISCO injection.
- vi) The Technical Memorandum called for waiting 3 months after the socks are removed before sampling. According to the SAP, Worksheet #10a and Worksheet #16, this waiting period will be 2 months.
- vii) The Technical Memorandum called for analyzing groundwater three months after the socks were removed for VOCs, SVOCs, and TPH. It appears that TPH has been eliminated from the program.

II. Page-Specific Comments

1. Page 5, Worksheet #3: Distribution List: Please include the following people on the Distribution List for the Sampling and Analysis Plan (SAP) as they are listed on either Worksheet #4 (Project Personnel Sign-off Sheet) or Worksheet #5 (Project Organizational Chart):
 - a) Navy QA Officer, Sherri Eng
 - b) CH2M Hill Quality Assurance Officer, Paul Favara
 - c) CH2M Hill Program Chemist, Anita Dodson
 - d) CH2M Hill Health and Safety Officer, Mark Orman

Page 45, Worksheet #11: Project Quality Objectives/Systematic Planning Process Statements: As part of the response to question #2, the text states that the quantitation limits (QLs) are greater than the project action limits (PALs) for SPLP naphthalene in subsurface soil, naphthalene in groundwater, and bis(2-ethylhexyl)phthalate in groundwater. The text states that these exceedances are acceptable since the method detection limits (MDLs) for these compounds are below the respective PALs and any detected concentrations would therefore be reported as estimated values. However, for this investigation which focuses on a small number of contaminants of concern (COCs), every effort must be made to have QLs lower than the PALs. If these compounds are not detected, the QLs will be above the preliminary remediation goals (PRGs) and decisions will not be able to be made with a high degree of accuracy. MDLs should not be relied upon to achieve project objectives as these values are statistically derived. The accuracy of MDLs is verified by the laboratory analysis; however, the accuracy of QLs is verified by the analysis of standards at the QL. As per comments # 5 and 6 below, it is appropriate to use selective ion monitoring (SIM) analysis to ensure all QLs will meet the PALs. Revise this worksheet accordingly.

2. Page 75, Worksheet #15-3: Reference Limits and Evaluation Table (SPLP VOCs): Please revise the PALs column to include the values listed in Table 2 on page 44 of Worksheet #11.
3. Page 76, Worksheet #15-4: Reference Limits and Evaluation Table (SPLP SVOCs):
 - a) Please revise the PALs column to include the values listed in Table 2 on page 44 of Worksheet #11.
 - b) Due to the focused nature of this investigation, every effort should be made to ensure that the QLs achieve the project action levels. Therefore, SIM analysis is appropriate for this analysis (as is being done for soil samples) in order to ensure that the PAL for SPLP naphthalene is achieved. Please revise the worksheet accordingly.
4. Page 79, Worksheet #15-7: Reference Limits and Evaluation Table (SVOCs-Groundwater): Due to the focused nature of this investigation, every effort should be made to ensure that the QLs achieve the project action levels. Therefore, SIM analysis is appropriate for this analysis (as is being done for soil samples) in order to ensure that the PALs for naphthalene and bis(2-ethylhexyl)phthalate are achieved. Please revise the worksheet accordingly.

5. Page 93, Worksheet #19: Analytical SOP Requirements Table:
 - a) For SPLP SVOCs, the standard operating procedure (SOP) reference provided in Worksheet #19 indicates that SIM analysis will be performed. This is the preferred method that would allow the achievement of the naphthalene PAL. However, according to Worksheet #15-4, the full scan SVOC method is being utilized. Worksheet #15-4 should be updated to include the SVOC SIM QLs and subsequently, no modification would be needed for this worksheet. Ultimately, revisions must be made so both worksheets are consistent.
 - b) The sample volume for filtered metals and nitrate/sulfate analyses of groundwater needs to be changed from 50 mL to 250 mL.
 - c) The holding time for pH of soil samples must be changed from "not applicable" to "as soon as possible" as per the SW-846 method.
 - d) The holding time for sulfate/nitrate analyses of groundwater must be revised to clarify that the 28 day holding time is for sulfate.
 - e) For SVOC analyses of soil samples, SPLP SVOC analyses of soil samples, SVOC analyses of groundwater samples, and filtered metals analyses of groundwater samples, please include the preparatory method SOP in column #3.
6. Page 95, Worksheet #20: Field Quality Control Sample Summary Table: The table is missing AOC E soil sampling in the smear zone (28-32 ft bgs), one sample from each location. Please update the worksheet accordingly.
7. Page 97, Worksheet #21: Project Sampling SOP References Table:
 - a) Please clarify if SOP A-6 (Soil Sampling for VOCs Using the EnCore Sampler) will be used. According to Worksheet #19, VOC soil samples will be collected directly into preserved vials in the field. Therefore, sampling with an EnCore sampler will not be required.
 - b) Please provide the SOP that will be used in the field for measuring persulfate in groundwater.
8. Page 99, Worksheet #22: Field Equipment Calibration, Maintenance, Testing, and Inspection Table:
 - a) Please clarify how YSI multi-meter calibration procedures are different from the YSI pH probe and specific conductance probe calibration procedures.
 - b) Add the instrumentation that will be used to measure persulfate in the field and the corresponding maintenance and calibration procedures for this instrumentation.
9. Page 102, Worksheet #23: Analytical SOP References Table: The analytical group associated with SOP 110.0032 needs to be changed from SPLPV and SPLPS to WCHEM, as shown in Worksheet #19.
10. Page 109, Worksheet #25: Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table:
 - a) Please remove the rows for CVAA and the colorimeter as these instruments will not be used for this program.

- b) Please revise the acceptance criteria for the pH meter to ± 0.05 pH unit (not 0.1), as per Worksheet #24.
- c) Please revise the acceptance criteria for the TOC analyzer to $\pm 10\%$ (not 15%), as per Worksheet #24.
- d) Please add SOP 70.0033 with the SOP references for GC/MS.
- e) Please replace the pH SOPs with SOP 100.0112.

11. Page 115, Worksheet # 28: Laboratory QC Samples Table:

- a) Worksheet #15 was referenced for the QC acceptance limits for LCS, LCSD, MS, and MSD recoveries and RPDs. The QC acceptance limits provided in Worksheets #15 for VOCs and SVOCs were the same for both soil and water matrices. Please check this with the laboratory as typically recovery limits vary between the soil and water matrices.
- b) Please revise the corrective action for the LCS for all VOC and SVOC analyses (Worksheets #28-1, 28-2, 28-3, 28-4, 28-6, and 28-7) to include the potential for recalibration if outside of the acceptance limits.
- c) The QC acceptance limits provided for the LCS in Worksheet #28-2 reference Worksheet #15 which shows recovery criteria for full scan SVOC analyses. Since SIM analyses are being performed for the SVOC analyses of soil samples, the LCS criteria should be 45-135%, as per the laboratory's SOP. Please revise the worksheet accordingly.
- d) The QC acceptance limits provided for surrogates in Worksheet #28-2 show recovery criteria for 3 surrogates from the laboratory's SOP for full scan SVOC analyses. However, as per the laboratory's SOP for SIM analysis (which is being performed), the required surrogate is benzo(e)pyrene-d12 and the recovery criteria are 45-135%. Please revise the worksheet accordingly.
- e) The QC acceptance limits for surrogates for all VOC analyses (Worksheets #28-1, 28-3, and 28-6) show that it is acceptable for one surrogate to be outside of the acceptance limits. This is not acceptable and is not in accordance with the method or the laboratory's SOP; if one or more surrogates are outside of the acceptance criteria for VOC analyses, reanalysis must be performed. It should be noted that validation guidelines also will qualify data if one or more surrogates are outside of the acceptance limits. Therefore, please revise the associated Worksheets accordingly.
- f) The QC acceptance limits for surrogates for all SVOC analyses (Worksheets #28-2, 28-4, and 28-7) show that it is acceptable for one surrogate per fraction to be outside of the acceptance limits. This is acceptable but only if the recovery of that surrogate is greater than 10%. If one surrogate per fraction is outside of the acceptance limits and the recovery is less than 10%, corrective action must be performed. It should be noted that validation guidelines will reject data if one surrogate in a fraction exhibits less than 10% recovery. In addition, the laboratory's SOP also states the recovery must be greater than 10%. Therefore, please revise the associated Worksheets accordingly.
- g) Worksheet #28-7 shows that the laboratory is required to use the acid surrogates in all groundwater samples analyzed for SVOCs. Since the target compounds are all in the base-neutral fraction, the use of the acid surrogates will not be required. Please revise this worksheet accordingly.

12. Page 133, Worksheet #30: Analytical Services Table: Please update the number of Sample Locations to be consistent with Worksheet #20, which will be revised based on comment #8.

13. Page 135, Worksheet #31: Planned Project Assessments Table: Please have someone independent from the field team leader perform the field audits. PREQB suggests that the person who prepares the field audit report conduct the field audit.
14. Page 143, Worksheet #33: QA Management Reports Table: PREQB noticed that Brett Doerr, the Environmental Manager, is not listed as a recipient of the field audit report. Generally, the Environmental Manager receives this report. Please add his name to the recipient list, as appropriate.