

N91192.AR.001052
NIROP FRIDLEY
5090.3a

EMAIL AND ATTACHED MINNESOTA POLLUTION CONTROL AGENCY COMMENTS
REGARDING THE UNIFORM FEDERAL POLICY SAMPLING AND ANALYSIS PLAN QUALITY
ASSURANCE PROJECT PLAN FOR SOURCE AREA GROUNDWATER INVESTIGATION
INITIAL AND PRELIMINARY DRAFT SCOPE OF WORK SOURCE CONTROL
INVESTIGATION WITH FIELD SCALE TRIAL OF EMULSIFIED ZERO VALENT IRON
INJECTION NIROP FRIDLEY MN
10/05/2012
MINNESOTA POLLUTION CONTROL AGENCY

From: deAlwis, Deepa (MPCA) [<mailto:deepa.dealwis@state.mn.us>]
Sent: Friday, October 05, 2012 16:11
To: Pokorny, Harvey D CIV NAVFAC MW, EV1
Cc: Sheila Desai; Paul Lucas; Dean Krebs; Jacob Knapp
Subject: NIROP Source Inv MPCA Comments

Hi Harvey,

I wanted to get MPCA's comments to you before the meeting. I realize that you may not be able to review it before the meeting, but I figured it is good to have it on hand.

Deepa

MPCA Comments on UFP-SAP/QAPP for Source Area Groundwater Investigation, Initial and Preliminary Draft Scope of Work – Source Control Investigation with Field-Scale Trial of Emulsified Zero Valent Iron Injection dated September 13, 2012

October 5, 2012

Preliminary Draft Scope of Work – Source Control Investigation

General Comments

1. The document reviewed is stated to be prepared for conceptual consensus discussion and appears to be written similar to a request for proposal to complete a source investigation. The work plan described within this document varies significantly from the previously reviewed scope for the site investigation (Phone Memorandum from Harvey Pokorny to EPA/MPCA, dated April 9, 2012). Differences of note include:
 - Previously reviewed scope of work indicated a concentric ring method for stepping out from the starting point in the East Plating Shop (EPS) while the work plan presented appears to use multiple east-west transects and a singular north-south transect. The starting point of the investigation is not identified. Step out criteria is also not identified.
 - The work plans differ in the presentation of the interpreted plume orientation. The new work plan indicates connection between the EPS and the former paint shop area of the BAE Systems property. This presentation does not correspond with the plume interpretation presented in the previously agreed to work plan or the historic plume interpretation in the 2011 AMR.
 - The probable source area in the vicinity of AOC-17 is larger than the probable source area in the EPS in the new work plan. Data points, in addition to those proposed, will likely be required in order to provide sufficient information to define this area.
 - The proposed work plan also discusses the potential injection of emulsified zero valent Iron (EZVI) while the previous work plan did not.
2. The document provides a loose framework for the development of a three step work plan and also references undefined options (“option 2”). The document does not provide enough information to clearly define a scope of work and develop a complete UFP-SAP/QAPP. Moreover, the description of the proposed work requests that a contractor develop the UFP-SAP/QAPP suggesting that a revised QAPP would be issued in the future. The MPCA was expecting a completed UFP-QAPP considering Navy had over six months to develop the document.

Based on both the change in work scope and ambiguous description of proposed work provided, the MPCA believes that development and review of a UFP-SAP/QAPP would be premature at this time. Further discussion between the NIROP technical group and RPMs to fully develop an agreed on scope of work should be considered prior to proceeding with QAPP discussions.

3. As stated in the *Preliminary Draft Scope of Work*, “The goal is to develop data necessary to assess potential source control alternatives and to develop a baseline from which such actions can be evaluated.” Consequently, The MPCA believes consideration of implementing Step 3 (EZVI) under this phase of work is premature and beyond the goals originally discussed for the source investigation.
4. The MPCA believes that documentation of the previously agreed to scope of work and the timeline for development of the work scope and QAPP should be compiled to illustrate delays in QAPP development.

SPECIFIC COMMENTS

Step 1 – MIP Investigation:

1. The MPCA believes that the information obtained from the Membrane Interface Probe (MIP) and CPT (i.e., electrical conductivity (EC)) can be very useful in evaluating the subsurface geology, extent of gross CVOC impacts and in identifying sampling horizons for quantitative analysis. Therefore, the MPCA supports the use of this technology for qualitative evaluation of the site. However, the MPCA believes that MIP/CPT is not an appropriate technology for quantitative evaluation. See the comment below.
2. Based on previous investigations in the vicinity of the site, The MPCA has concerns with respect to the ability of the MIP technology to detect dissolved CVOC concentrations in groundwater at or below 11 milligrams per liter (mg/L). Consequently, the Navy may need to collect multiple soil and groundwater samples in order to evaluate analytical results of both soil and groundwater against MIP response. Soil and groundwater samples collected for laboratory analysis from locations with both positive and negative MIP response would likely be necessary if the Navy plans to proceed with the MIP technology. In the next revision of the UFP-QAPP, please provide details of how Navy will accomplish this. The MPCA suggests that quantitative soil and groundwater analysis should be included in the proposed work plan in conjunction with the MIP for confirmation purposes.
3. The Navy’s plan includes six (6) borings/probes between the BAE paint shop source area and MS-33I to evaluate a possible plume connection. Given that the goal of the source investigation is to define the sources beneath the NIROP facility versus attempting to potentially tie plumes together, the MPCA believes two or more of these borings/probes should be converted to “reserve” points in the event further delineation is required elsewhere beneath the NIROP facility.
4. Has the Navy considered technology such as compound specific isotope analysis for Carbon and/or chlorine in trying to differentiate CVOC plumes?
5. The Technical Team discussed limiting the vertical extent of the investigation to 70-feet to prevent the potential penetration of clay horizons underlying the intermediate flow horizon. The new extraction wells extend to 100 feet outside the building footprint. Please specify decision criteria to

be included in the SAP for termination of borings and protection of the deep flow horizon from potential vertical migration of DNAPL.

6. In the area around the EPS, how does the Navy plan to advance probes in this area to minimize the potential for vertical spreading of DNAPL if “hot” responses are detected above a confining unit?
 - The MPCA suggests that a detailed SAP/QAPP be prepared that presents decision steps the Navy plans to follow in the field with respect to vertical advancement of MIPs.
 - Consideration of installing surface casing into the upper confining unit should be included in the detailed SAP/QAPP to limit the potential of mobilizing DNAPL.
 - A discussion of the probe hole abandonment protocols should be included in the detailed SAP/QAPP.
 - If the Navy is unable to advance CPT points to depths of 75+ feet, an alternative method should be proposed for consideration by the Technical Team.
7. The Navy should provide the sequencing of the proposed borings/probes and the rationale for using “reserve” borings/probes including the step-out decision criteria.
8. The Navy should plan on installing multiple intermediate flow horizon monitoring wells versus one or two additional well nests to provide more detailed gradient/flow definition in this primary contaminant pathway. These additional wells would also be useful in providing monitoring points to evaluate the effectiveness of the ERD field trial, once a detailed field trial work plan is prepared and approved.

Pre-design Source Control Investigation Report for Pump and Treat System Optimization

9. Based on the additional information to be collected under this source investigation phase, The MPCA would suggest having the subsurface information normalized and compiled from all of the probes/borings for input into a 3D Geologic Model. Analytical data could also be input into this model for 3D mapping, analysis, and use in evaluating source control measures.

Step 2 - Quantitative Vertical Profiling Option:

10. It’s not clear in the SOW what differentiates Option 2 from Option 1.
11. This SOW assumes the collection of, on average, four groundwater samples per boring to be analyzed for VOCs. The SOW further states that “at least one of the four groundwater samples within each borehole would be obtained from 6, 7, or 8 feet below the water table”. It appears that the Navy plans to supplement the 1997 water table sampling data.
 - The SAP should include a detailed discussion as to what the criteria/rationale will be for collection of groundwater samples during vertical profiling.

12. How will the hydraulic conductivity (K) be measured/determined under Option 1? It is assumed that hydraulic conductivity will be indexed using the Waterloo probe/sampler which involves continuous injection of water during probe advancement and continuous profiling. Please confirm our assumption and whether electrical conductivity data would be collected in conjunction with K-indexing during probe advancement.
- A detailed discussion of how the Waterloo probe/sampler will be utilized should be included in the SAP.
13. As noted above, the Navy should consider installing multiple intermediate flow horizon monitoring wells versus one or two additional well nests to provide more detailed gradient/flow definition in this primary contaminant pathway. While well nests would provide additional vertical hydraulic gradient information and water quality data, the MPCA believes a better understanding of the intermediate flow horizon would provide more useful information leading up to and evaluating source control measures.
14. Given that the goal of this investigation is to assess the identified potential source areas beneath the NIROP facility, the MPCA believes that at least two soil samples should be collected from above the water table interface at all probe locations where MIP response readings exceed 5×10^5 uV on the ECD detector (or equivalent), with one sample collected from the horizon with the highest MIP response reading and the second from immediately above the water table interface.
15. Additional soil sampling at depth is warranted to assess the residual CVOC mass concentrations immediately above and within silt or clay “confining” horizons. The Navy has repeatedly suggested that the residual CVOC mass is “held” in these finer grained units. This is an opportune time to evaluate the Navy’s hypothesis, especially prior to recommending a source control approach.
16. The MPCA would also recommend that the Navy consider testing targeted soil types for physical properties that would be beneficial in evaluating and/or pilot testing an alternative to address the source area(s).
17. At a minimum, a combination of Step 1 and Step 2 methodologies are likely to be employed during this source investigation phase. Therefore, the Navy’s contractor should plan on preparing a UFP SAP/QAPP including both methodologies.

Step 3 - Field Scale Trial of Emulsified Zero Valent Iron Injection

18. Conceptually, the MPCA does not believe this is an effective approach for evaluating the EZVI technology. The proposed injection of EZVI is not targeted at a specific source area and subsequent quarterly monitoring will likely lead to inconclusive results and is unlikely to have a significant impact on source mass reduction.

19. The Navy should consider completing the source investigation prior to proceeding with a field scale trial of EZVI. The MPCA believes that a focused field trial with the incorporation of additional monitoring wells would provide more valuable information with respect to the effectiveness of the technology, radius of influence at injection points, and appropriate dosing concentrations/volumes.
 - This approach should provide a targeted implementation of the technology and a systematic evaluation of its effectiveness.

UFP-QAPP

General Comments

1. The QAPP was prepared using the format described in the *Uniform Federal Policy for Quality Assurance Project Plans* (EPA-505-B-04-900A, March, 2005).
2. The Figures and Appendices are missing from the UFP-QAPP. The Navy should supply these items for review.

Specific Comments

1. In Worksheet #1, the Navy should identify the individuals (name, title, and organization) who will approve the QAPP.
2. In Worksheets #3 and #4, the Data Validator is identified as “Kathy” Larson. In Worksheets #6 and #7, the Data Validator is identified as “Cathy” Larson. the Navy should clarify the name of the Data Validator.
3. In Worksheet #5, the Navy should identify the lines of communication between the various organizations that will be on the project. They should also identify the QA Officer for Resolution Consultants.
4. In Worksheet #7, the Navy should identify the persons who can approve the QAPP and identify the person who will distribute the signed copy of the QAPP to all parties. the Navy should identify who has the responsibility and authority to stop work on the project. There does not seem to be a responsibility to notify the regulators when there are problems, corrective actions need to be initiated, schedule changes, etc.
5. In Worksheet #8, the Navy has not identified any training or certification requirements for the laboratory staff. the Navy can reference sections in the Laboratory QA Manual, or provide laboratory certification records that cover the analytical scope of work for the project.
6. Please provide completed worksheets to meet the requirements for Worksheet #9.
7. In Worksheet #10, the Navy should identify how they will link the analytical results to the outcomes for the project (actions to be taken and how success will be measured).

8. In Worksheet #11, the Navy stated that the “VOC laboratory data must be of sufficient quality to quantify or estimate VOC concentrations at the MCL.” Under the 1989 Groundwater Protection Act, the Minnesota Department of Health has promulgated Health-Risk Limits for contaminants in drinking water. Navy may need to include an assessment versus these limits as well.
9. In Worksheet #11, the Navy should describe how the quality of the data is determined (accuracy, precision, sensitivity, comparability, representativeness, and completeness).
10. In Worksheet #12, field duplicates assess both sampling and analytical error. Navy should revise the Worksheet.
11. In Worksheet #12, the Navy needs to set performance criteria for lab duplicates (precision), Laboratory Control Sample spike recoveries (accuracy), Matrix Spike/Matrix Spike recoveries (accuracy) and duplication (precision), laboratory method blanks, surrogate spike recoveries (accuracy), and reporting limit verification (sensitivity).
12. For Worksheet #12, the MPCA requires spiking of the total analyte list into the Matrix Spike/Matrix Spike Duplicate and the Laboratory Control Samples (see the MPCA Laboratory Quality Control and Data Policy, <http://www.pca.state.mn.us/index.php/view-document.html?gid=16288>).
13. In Worksheet #12:
 - a) Representativeness can be ensured by the use of Standard Operating Procedures to collect and to analyze the samples,
 - b) Performance criteria for comparability need to be defined, and
 - c) Performance criteria for completeness need to be defined.
14. The Navy needs to provide completed worksheets to meet the requirements for Worksheet #13.
15. Worksheet #14 should include how many samples of each matrix are to be collected, what preparation and analytical methods are to be used to generate the data, what QC samples are to be analyzed with each analytical batch, what kind of documentation is to be maintained for the project, the requirements for the analytical report/data package, what assessment or audit tasks are needed for the project, how the data will be reviewed, and the requirements/format for any electronic data deliverable. the Navy should revise the Worksheet to include this information.
16. In Worksheet #15, the Navy needs to define the “TBD” for the Project Action Limit and Quantitation Limit Goal. It is not possible to determine if the analytical method QLs meet the requirements of the project. The QLs for Groundwater are not listed. the Navy must complete this Worksheet. EPA Method 8260B may not be the appropriate method to use to generate data that will be compared to MCLs. EPA Method 524.2 may be more appropriate. This method has a sensitivity of 0.5-ug/L for each target analyte. However, this method may not meet the limit for vinyl chloride. If the project needs to report vinyl chloride down to 0.2-ug/L, the lab may need to report down to their method detection level. The TCL compound list is different than the list of VOCs that the MPCA uses (see the compound list for 8260B in <http://www.pca.state.mn.us/index.php/view-document.html?gid=16289>).

17. Please provide completed worksheets to meet the requirements for Worksheet #16.
18. In Worksheet #18, please verify that 2-ug/L is as low as they need the lab to go.
19. In Worksheet #18, please define the "TBD".
20. In Worksheet #18, the Navy has identified tests for particle distribution/sieve analysis, soil porosity, bulk density, total iron, total organic carbon, TCLP VOCs, TCLP SVOCs, TCLP Pesticides, TCLP PCBs, TCLP Metals, Reactivity, Ignitability, and pH. These methods need to be included in Worksheets #14 and #15. There is no TCLP regulation for PCBs (however, there are two herbicides that are regulated). Per SW-846, EPA "relies solely on a descriptive, prose definition of reactivity because available tests for measuring the variegated class of effects embraced by the reactivity definition suffer from a number of deficiencies." Navy should remove this analyte from the group.
21. In Worksheet #18, the Navy has identified a sample from IDW as a "water" matrix. It may be more advisable to refer to it as a "waste" or "liquid" sample. Navy needs to define the analytical methods for SVOCs in water, Pesticides/PCBs in water, metals in water, Reactivity, Ignitability, and pH in Worksheets #14 and #15. There is no TCLP regulation for PCBs (however, there are two herbicides that are regulated). Per SW-846, EPA "relies solely on a descriptive, prose definition of reactivity because available tests for measuring the variegated class of effects embraced by the reactivity definition suffer from a number of deficiencies." The MPCA recommends that Navy removes this analyte from the group.
22. In Worksheet #19, the Navy may be able to remove the information for "Reactivity". Is the analysis for total phenols by EPA Method 9066 required for the project? This is the first mention of it. Navy may want to consider identifying the liquid matrix for IDW as a "waste" or "liquid". Navy may also want to consider not analyzing for odor, density, color, and water content in a "water" matrix for IDW.
23. Navy should complete Worksheets #20, #21, #22, and #23.
24. In Worksheet #24, please verify the EPA Methods listed under the Instrument column on page 56. Navy should verify that the breakdown check on page 58 contains Endrin.
25. In the revised QAPP please identify sample collection, packaging, and shipping personnel in Worksheet #26.
26. Worksheet #27 needs to be completed.
27. In Worksheet #28, include information on field blanks, trip blanks, and equipment blanks. Also include information on lab duplicates, internal standards, surrogate spikes. Report level verification standard, initial calibrations, and continuing calibration verification checks.
28. Worksheet #29 needs to include information on analytical records and data assessment records.
29. Worksheet #30 needs to be completed.

30. In Worksheet #32, the regulators are missing from the notification step.
31. In Worksheet #33, the regulators are not identified as report recipients.
32. In Worksheet #36, Navy may want to consider using a more current version of the National Functional Guidelines for Organic Data Review.
33. In Worksheet #18, Navy introduced two samples to be tested for characterization as a hazardous waste. The characterization was not discussed in Worksheets #10, #11, #12, #15, #16, #17, #20, and #21. Please revise these worksheets with the information for this activity.