



United States Environmental Protection Agency

One Congress Street, Suite 1100 (HBT)
Boston, MA 02114-2023

September 22, 1999

Mr. Emil Klawitter,
Northern Division - NAVFAC
10 Industrial Highway,
Code 1811/EK - Mail Stop 82
Lester, PA 19113-2090

Re: Draft Work Plan for the Characterization of CVOC Contamination at the former Nike PR-58 and adjacent Navy NCBC Davisville Site 03, dated September 3, 1999, former Naval Construction Battalion Center (NCBC), Davisville, Rhode Island

Dear Mr. Klawitter:

Pursuant to §7.6 of the NCBC Federal Facility Agreement, please find enclosed the Environmental Protection Agency's (EPA) draft comments on the above referenced document. These comments are draft due to the shortened time-frame allowed (from 45 days under the FFA to 17 days) for review by the Army Corps of Engineers. We will provide additional comments on or before October 14, 1999.

If you have any questions with regard to this letter, please contact me at (617) 918-1384.

Sincerely,

A handwritten signature in cursive script that reads "Christine A.P. Williams".

Christine A.P. Williams
Remedial Project Manager
Federal Facilities Superfund Section

Enclosure

cc: Richard Gottlieb, RIDEM
Walter Davis, CSO
Peter Hugh, ACOE
Andy Beliveau, EPA
Bill Brandon, EPA
Eileen Cury, Dynamac Corporation
Jim Shultz, EA Engineering, Science and Technology
Marilyn Cohen, Town of North Kingston

Howard Cohen, RIEDC
Anne Heffron, Applied Enviro-Tech, Inc.
Dinalyn Spears-Audette, Narragansett Tribe

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GENERAL COMMENTS

1. The QAPP included in the Appendix A does not follow EPA-NE QAPP guidance (September 1998). This is unacceptable. Additional comments will follow on or before October 14, 1999.
2. A review of the historical data at the Nike Battery Site PR-58 (Sirrinc Environmental Consultants, 1988, and Metcalf and Eddy, 1994) indicate that there were several inorganic exceedances of MCLs and RIDEM GA standards in the groundwater. In particular, the latter reference indicates exceedances of aluminum, beryllium, iron, lead, and manganese. With the exception of manganese, most of the detections also exceeded background groundwater inorganic concentrations (as developed by Stone and Webster, 1996). Given the migration of the plume off-site into RIDEM GA territory, it is recommended that inorganics be included in the site investigation activities. In addition, Arsenic, Lead and Manganese have been determined to be COCs for the ingestion of groundwater exposure scenario at the former NCBC sites 2&3 and Arsenic, Beryllium, Lead and Manganese have been found above the region 9 risk screening level at site 1. Inorganics must be added to the analyte list for all the wells in order to fully characterize the current and future possible risk to human health at these sites.
3. The COE and the Navy should confirm that there are no other residential wells (in addition to the eight already identified) that may be impacted by contamination migrating off-site. After confirmation, all residential wells should be resampled for VOCs (for several reasons, one being the significant increase in total CVOC concentration in MWZ3-01 from 1996 (61 ug/L) to 1998 (1,181 ug/L)) and inorganics (see General Comments). For the past year, EPA has also repeatedly requested construction details (e.g., total depth/elevation, groundwater intake depth/elevation, and geologic media at intake depth/elevation) of the eight residential wells; however, the information has not been gathered/provided to date. Construction details should be provided in the report presenting the results of this investigation in order to fully evaluate the possibility of contaminants effecting the residential wells.
4. Monitoring well EA-113D (adjacent to residential property) was sampled in 1998 and contained 0.8 J ug/L cis-1,2-DCE and 0.7 J ug/L TCE. The installation and sampling of EA-113R, and the re-sampling of EA-113D, will provide additional information; however, the results may warrant additional investigations between EA-113D/R and the residential property.
5. EPA previously commented that the full extent of the soil source area has not yet been delineated in the area of EA-102 and MW03-14D due to contaminants detected in boring

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soil samples. EPA acknowledged that the detected levels were low; however, recommended additional investigations in this area. The Navy responded (EA, November 1998; General Comment 5a) that "These data do not necessarily indicate a nearby shallow source, especially with only about a 4 ft vadose zone that has been exposed to rain infiltration for the past 16 yrs to more than 40 yrs". Although this may not necessarily indicate a nearby shallow source, it is a possibility. The Navy should consider conducting additional soil sampling in this area as part of the proposed investigation.

6. EPA provided the following comment in a previous document review (EA, December 1998) and it is reiterated here for convenience:

The potential complicating effects of the storm sewer system should be examined over time in relation to contaminant trends observed in groundwater and/or sediment at the outfall area. It is possible that the storm sewer network has transported contaminants to the Harbor in the past, and continues to do so. Depending on the depth of the storm sewers in relation to the ground water, the sewers and/or backfill material have the potential to interact with ground water as both "sources" and "discharge" loci for contaminants. Since the depth position of the sewers relative to ground water has not been specified, both types of exchange with the ground water are possible.

It is acknowledged in the report that, "Exfiltration of solvent-containing storm runoff from joints in the clay/cement pipes and catch basin bottoms may have occurred downgradient of the Nike Site. The drainage system could transport VOC down gradient more quickly in an easterly direction than would be expected if it flowed in the subsurface with the ground water." In this light, the relationship of elevated inorganics detected in the Allen Harbor sediments near the outfall, which may represent a cumulative effect, is not clear. Also, there is a pervasive low level shallow ground water problem in Areas 01, 02 and 03 which may be at least be partially drained to the Harbor via the storm sewer network.

The status of the sewer network relative to site 01/02/03/04/NIKE should be assessed and included in LTMP development and/or in context of any additional site characterization activities. The depth relationship of the engineered structures relative to the ground water table as well as any major areas of potential exchange with the ground water should be identified. Future monitoring activities should be expanded to include the area of the storm sewer discharge to Allen Harbor for ground water, surface water, and sediment media.

7. The three lines of evidence that can be used to support natural attenuation of chlorinated aliphatic hydrocarbons include:

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- i. Observed reductions in contaminant concentrations along the flow path downgradient of the source of contamination.
- ii. Documented loss of contaminants at the field scale using-
 - a. Chemical and geochemical data including;
 - decreasing parent compound concentrations
 - increasing daughter compound concentrations
 - depletion of electron acceptors and donors
 - increasing metabolic byproduct concentrations
 - b. A conservative tracer and a rigorous estimate of residence time along the flow path to document contaminant mass reduction and to calculate biological decay rates at the field scale.
- iii. Microbiological laboratory or field data that support the occurrence of and give rates of biodegradation.

In order to assess whether or not natural attenuation is occurring, a careful evaluation over time needs to be performed to ensure that the groundwater samples being collected to evaluate the presence or absence of natural attenuation are within the same flow path. This is critical to the review of the data. A second criteria that needs to be met, assuming the same flow path, is that mass reduction of contaminant is occurring.

In addition, EPA recently released the final version of its OSWER directive titled Use of Monitored Natural Attenuation as Superfund, RCRA Corrective Action, and Underground Storage Tank Sites (EPA, April 1999) which includes the following statement:

Decisions to employ MNA as a remedy or remedy component should be thoroughly and adequately supported with site-specific characterization data and analysis. In general, the level of site characterization necessary to support a comprehensive evaluation of MNA is more detailed than that needed to support active remediation. Site characterization for natural attenuation generally warrant a quantitative understanding of source mass; groundwater flow (including preferential pathways); contaminant phase distribution and partitioning between soil, groundwater, and soil gas; rates of biological and non-biological transformation; and an understanding of how all these factors are likely to vary with time. This information is generally necessary since contaminant behavior is governed by dynamic processes which must be well

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understood before MNA can be appropriately applied at a site. Demonstrating the efficacy of MNA may require analytical or numerical simulation of complex attenuation processes. Such analyses, which are critical to demonstrate natural attenuation's ability to meet remediation objectives, generally require a detailed conceptual site model as a foundation.

A more technical and detailed source of information on natural attenuation is: AFCEE, 1996, Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater, Draft - Revision 1, San Antonio, Texas, November. The COE and the Navy should consult this document to ensure that the natural attenuation parameters listed in Tables 3-2 through 3-4 of the work plan are comprehensive.

Before MNA can be considered a remedy component, the COE and the Navy must demonstrate: 1) that it is addressing all site-related contaminants (and also address the creation of more toxic transformation products that pose a greater risk than the parent compounds, such as vinyl chloride), 2) that it is occurring at an adequate rate and is protective of potential receptors, and 3) that it will remediate the site within a reasonable time frame.

8. The COE and the Navy should consider conducting a fracture trace analysis, as previously recommended by EPA (comments on EA, December 1998), to further evaluate the transport of contaminants to the area north/northeast of the site.
9. EPA previously stated (comments on EA, December 1998) that the wetlands to the north of the site should be investigated in light of their possible role as areas of contaminant discharge.
10. EPA had commented on EA's December 1998 Revised Draft Final Study Area 01 and 04 and IR Program Sites 02 and 03 Phase III RI that "a replacement well at the former MW02-07D location should be included in the LTMP development and/or in context of any of the additional site characterization activities." The work plan indicates that MW02-07D will be sampled, but does not indicate if this well was re-installed between December 1998 and the present. This well was removed during the site 2 lead removal action. It contained the highest level of CVOCs in the site 2 area and should be re-installed.
11. The COE and the Navy proposes the 10 ppm VOCs (PID) cutoff for spreading drill cuttings and discharging groundwater on-site (Sections 4.12.1 and 4.12.2). If the contamination found in the wells mimics what has been found in the past at those same locations, this is acceptable. However, the new well location EA114 does not have a past analytical history. Full disposal characterization should be completed prior to on-site

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disposal, IAW RIDEM IDW policy.

12. The report should interpret the data gathered by this investigation not just present the data and jump directly to the conclusions section with out any explanation of what the data means.

SPECIFIC COMMENTS

1. **Section 1.2, Objectives and Scope of Work Plan, Page 2, Paragraph 1.** The following comments pertain to this section:

- a. The third bulleted objective of the proposed investigation is to assess the nature and extent of the CVOC plume with specific focus on the northeast edge that extends off the former Nike Site and Navy properties. Relevant to this objective, a main concern is the residential water supply wells located in this area. The work plan should identify and discuss the data obtained from the private wells in the north-northeast area. As previously commented by EPA, the existing residential well water quality data set consists of one sampling event for eight residential wells in May of 1997. Samples were analyzed for VOCs only.
- b. Another objective of the proposed investigation (for both Navy and USACE portions) is to further assess natural attenuation (develop isopleth plots). Previous investigations at the site (EA, October 1998; EA, December 1988) concluded that there was "adequate to limited evidence for biodegradation of CVOC" and that "biodegradation does not appear to be a significantly active attenuation process, although it may be occurring at a slow rate."

EPA has not agreed with the Navy's conclusion that the evidence for biodegradation may be "adequate" (refer to previous EPA comments on this issue). In addition, EPA also previously noted that the natural attenuation assessment (EA, October 1998; EA, December 1998) was based solely on the data from deep wells EA-105, MW03-14D, MW03-07D, MW02-10D, MW01-14D, and EA-112D. With the exception of EA-112D which is screened in 10 ft of weathered bedrock, the remaining wells are screened in the overburden (sand, silt, and/or gravel). As such, the former fate and transport discussion was also limited to the deep well layer. EPA recommended that the Navy address the fate and transport of contaminants in the shallow and bedrock layers.

In addition, the Navy previously stated (EA, November 1998) in response

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to EPA's General Comment 5a that "Because the data do not support natural biodegradation at the site, the Navy is not pursuing natural attenuation as a remedial alternative".

To clarify the Navy's position with respect to the demonstration of natural attenuation at the site, the work plan should: (1) briefly summarize the previous efforts with respect to the demonstration of natural attenuation, (2) discuss the rationale for the additional sampling of natural attenuation parameters, and (3) indicate how the additional investigation will address the fate and transport of contaminants in the shallow and bedrock layers.

2. **Section 1.2, Objectives, Page 2, Paragraph 3.** The last bullet on this page states that "...An elaborate detailed level of effort is not the intent of this assessment". Clarify the meaning of "an elaborate detailed level of effort". Will this evaluation of remedial alternatives be as rigorous as a feasibility study required by a site on the National Priorities List?
3. **Section 1.3, Key Personnel, Page 3, Paragraph 1.** The "Key Personnel" listed should include the QA/QC Officer, the Health and Safety Officer, and any other personnel having a significant role in the investigation or evaluation of results (e.g., data validators, risk assessors, etc.). Including the COE and Navy personnel having a significant role in the evaluation of results.
4. **Section 2.1.1, Former PR-58 Site, and Section 2.1.2, NCBC Davisville Site 03, Pages 1 through 3.** These sections discuss several potential contaminant sources for the contamination in the Former PR-58 Site and Site 03. It is not clear why Study Areas 01 and 04 and Site 02 are not included in this discussion.

In addition, the location of each of these potential sources should be clearly shown on a figure (i.e., show locations of Building 224, Building 344, Building 345, all USTs, etc.)
5. **Section 2.3, Site Area Hydrogeology, Page 3, Paragraph 1.** It is stated that the deep zone ground water and bedrock zone groundwater are interpreted to flow southeast from the former Nike site and the residential area located north of the Nike Site. While the groundwater elevation data collected from existing wells generally supports this statement, it should be clarified that contamination has migrated to the north and northeast (contrary to the interpreted southeast groundwater flow direction). As written, this statement implies that deep and bedrock ground water is moving away from the residential area, and therefore the residents are not at risk. This has not been demonstrated to be the case and the statement should be qualified.

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6. **Section 3.2, Field Program, Page 1, Paragraph 4.** Both packer testing and geophysical logging of open rock portions are proposed as part of the field program. Clarify the order in which these two test methods will be conducted (i.e., it is unclear whether geophysical logging will be used to isolate fracture zones for subsequent packer testing). In addition, please provide the field procedures for EPA review once they are received.
7. **Section 4.4, Drilling and Subsurface Sampling, Page 1, Paragraph 2.** As discussed in the bullets of this paragraph, two methods - drive and wash, and air rotary - are proposed for rock drilling. The drive and wash method is proposed for CVOC source areas and residential areas. The air rotary method is proposed outside of CVOC source areas and in non-residential areas. It is speculated that the rationale for limiting air rotary to source areas and non-residential areas may be due to potential air emissions during drilling; however, this is not clear. The text should state the rationale for specifying two methods for rock drilling which are dependent upon location.
8. **Section 4.4.1, Soil Boring and Sampling, Page 4, Paragraph 1.** It is stated that soil sampling will be continuous in the 10-ft zone above top of competent bedrock or refusal. Clarify what is meant by "continuous" soil sampling.
9. **Section 4.4.3.1, Soil Borehole Logging Requirements, Page 4, Paragraph 1.** The soil boring log, referenced as attached, could not be located in the work plan. This discrepancy should be corrected.
10. **Section 4.5.1.1, Screened Interval, Page 8, Paragraph 1.** The text states that Tables 1a, b, and c provide the screened intervals for the wells to be installed; however, the tables actually provide the screened zones (e.g., overburden/weathered rock, shallow rock, and deep rock). The text should be corrected accordingly.

In addition, the text should clarify the methods that will be used to aid in the selection of the most appropriate screened interval (i.e., geophysical borehole logging and packer tests).
11. **Section 4.7, Ground-Water Sampling, Page 12, Paragraph 1.** The ground-water sampling log, referenced as attached, could not be located in the work plan. This discrepancy should be corrected.
12. **Section 4.7.3, Ground-Water Sampling, Page 15.** The last bullet on this page (continues to Page 16) incorrectly references Table 3.1 and Chapter 4 of the QAPP. These references should be changed to Table 3-2 and Chapter 5, respectively.
13. **Section 4.7.3, Ground-Water Sampling, Page 15.** In the second bullet on this page,

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clarify that turbidity readings are to be taken using a turbidity meter, and not via the flow-through-cell.

14. **Section 4.10.1, Sample Designation and Labeling, Page 21, Paragraph 2.** QC samples should be labeled as “blind” samples. The current proposed labeling includes the designation of “RB” for rinseate blank, “DUP” for duplicates, and “TB” for trip blanks. The samples should not be labeled in manner that allows the laboratory to recognize them as QC samples.
15. **Section 4.10.2, Handling, Custody, and Shipping, Page 22, Paragraph 2.** Specify that a temperature blank will be included in each cooler.
16. **Section 4.10.3.3, Field Sampling Form, Page 24, Paragraph 1.** The field sampling form, referenced as attached, could not be located in the work plan. This discrepancy should be corrected.
17. **Table 1a, New Wells Within the Former NIKE PR-58 Site and Residential (North of Perimeter Road) Area and Table 1b, “Optional” Wells within the Former NIKE PR-58 Site and Residential (North of Perimeter Rd) Areas, and Table 1c, New Wells Within the Navy Study Area.** Geophysical borehole logging is not proposed for new bedrock wells MW03-14R2, EA-114R/R2, EA-117R/R2, MW01-15R, MW02-03R, MW03-03R, and MW01-13R which will be installed using the drive and wash method. The text and/or table (footnote) should explain the reasons why geophysical borehole logging is not recommended for bedrock monitoring wells installed by the drive and wash method.
18. **Table 3-2, Sampling and Analytical Program for the USACE Samples, and Table 3-3, Sampling and Analytical Program for the USACE Optional Samples.** A total of eight soil samples will be collected from the overburden in well boring locations EA-114D, EA-115D (an “optional well”), EA-116D, and EA-117D (an “optional well”). The work plan states that soil samples will be collected in each boring at 5-ft intervals until approximately 10-ft above the estimated depth to competent bedrock at which point sampling will be continuous to the top of bedrock or refusal (refer to Section 4.4.1). Since this sampling protocol will result in significantly more than eight samples (based on overburden estimates provided in Table 1a and Table 1b), clarify the samples will be collected and stored during boring advancement, and how the soil samples to be sent off for laboratory analysis will be selected.

In addition, please clarify if the USACE-Missouri River Division Laboratory will perform data validation IAW the EPA-NE QAPP guidance (September 1998).

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In addition, the work plan proposes to only analyze these soil samples for VOCs. This is understandable for the off-site wells EA-116D and EA-117D; however, it appears that EA-114D and EA-115D are proposed for installation in potential source areas (i.e., where dumping occurred). The analytical parameters (in addition to VOCs) should be re-evaluated, and broadened if necessary, based on the information about the materials that were dumped in these locations and data collected during previous investigations. At a minimum, inorganics and SVOCs should be added to the analytical parameters.

Appendix A - Quality Assurance Project Plan

GENERAL COMMENTS

19. A discussion of data validation and data usability (EPA, September 1998) could not be found in the QAPP, or the work plan. A section on data validation and usability should be added when the entire QAPP for the field sampling is revised IAW this guidance.