



DEPARTMENT OF THE NAVY

NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

1823/ME
N00129.AR.000458
NSB NEW LONDON
5090.3a

IN REPLY REFER TO

5090
Code 1823\ME
NOV 14 1996

Ms. Kymberlee Keckler
Remedial Project Manager
U.S. Environmental Protection Agency
J.F.K. Federal Building (HBT)
Boston, MA 02203-2211

Subj: RESPONSES TO EPA COMMENTS OF OCTOBER 1, 1996 ON THE DRAFT
GROUNDWATER MONITORING PLAN FOR THE DEFENSE REUTILIZATION
AND MARKETING OFFICE (DRMO) SITE AT THE NAVAL SUBMARINE
BASE, NEW LONDON, GROTON, CT

Dear Ms. Keckler:

Thank you for reviewing the Draft Groundwater Monitoring Plan (GMP) for the DRMO site at the Naval Submarine Base New London. I feel that the most important issue of this GMP that still needs final resolution is the decision-making framework that is being established. As you know, we are evaluating all the suggestions and recommendations that were given on this framework. I hope we can agree to a final decision framework and finalize the GMP very soon.

The Navy's responses to your comments are included in Attachment A. If you have any other questions or comments please do not hesitate to contact me at (610) 595-0567 ext. 162.

Sincerely,

Mark Evans
Remedial Project Manager
By direction of
the Commanding Officer

Copy to:
Mr. Mark Lewis, CTDEP
Mr. Andy Stackpole, NSB-NLON
Mr. Steve Ruffing, B & R - Pittsburgh (cover letter only)

Response to EPA comments of October 1, 1996

Re: Groundwater Monitoring Plan ("GMP") for the Defense Reutilization and Marketing Office ("DRMO")

Comment 1:

Overall, I am concerned that the plan lacks a decision-making framework regarding the use of the groundwater data collected. The plan should also specify why such data is being collected and how it will be used to determine future action at DRMO.

Response:

A decision-making framework will be included in the groundwater monitoring plan to detail the decision-making activities for evaluating the groundwater analytical data. An evaluation will be performed comparing Phase II RI soil contaminants with the CTDEP Pollutant Mobility Criteria for GB classified groundwater to determine initial chemicals of concern. The monitoring will include four sampling rounds to gain sufficient analytical data to evaluate the DRMO site. This data will then be evaluated to determine if trends indicate increasing levels, if there are contaminants present above action levels, or if any contaminant is present at two times its action level. Based on this evaluation it will be determined if no further action/reduced monitoring, additional monitoring locations, a risk assessment/evaluation, interim removal action, or Feasibility Study is necessary. The final framework will incorporate comments obtained during the RAB meeting.

Comment 2:

The DRMO is classified as a GA area by the Connecticut Department of Environmental Protection (CTDEP). The GMP should specify this, define the classification, and explain whether the monitoring data will be compared with drinking water standards. A copy of the letter from the CTDEP waiving the requirement to treat to GA standards should be enclosed as an appendix.

Response:

The groundwater in the area of the DRMO is in the process of being reclassified as GB. A letter was received by the Navy from the CTDEP stating that the DRMO meets the criteria to be classified as GB and a public hearing is scheduled for December 1996 to fulfill the public participation requirement. The CTDEP letter will be included as an appendix.

Comment 3:

The plan should clearly identify where the groundwater discharges to the Thames River. This is important to know when deciding where to collect sediment samples (referred to in §5.3, ¶3) to evaluate whether any contaminants in the groundwater are accumulating in the sediment. Accordingly, the decision-making framework recommended above should also include sediment data collection, evaluation, and appropriate response actions. This framework should specify when an action (e.g., confirmatory sampling, sediment or toxicity testing, sediment dredging, groundwater extraction & treatment) is warranted. For example, how many exceedances of the criteria used to evaluate the groundwater concentrations will prompt an action? What magnitude above these criteria would prompt an action?

Response:

The DRMO is located adjacent to the Thames River and the groundwater discharges along the entire shore length, therefore, any sediment samples which are determined to be necessary will be collected from the shore area adjacent to the DRMO. The decision framework which will be included in the GMP will also include the items discussed in this comment. Four rounds of groundwater sampling will be conducted annually to obtain analytical data. After the first four rounds of sampling is completed, the data will be evaluated to determine trends and the need for additional action.

Comment 4:

I am also concerned that you have not considered EPA's suggestion that you develop a comprehensive groundwater strategy for the NSB (see electronic mail message dated August 13, 1996). This is critical because there are several source areas that could contaminate the groundwater that ultimately discharges into the Thames River. This is especially important in the DRMO drainage basin where several contaminant source areas exist (e.g., Area A Landfill, Area A Wetland, Over the Bank Disposal Area, and Area A Downstream).

Response:

Based on the conference call with B&R Environmental, the Navy, EPA and CTDEP conducted on October 15, 1996, it was determined that the Navy agrees to consider a basewide study to address these issues.

Comment 5:

As documented in Table 3-1 of the post-removal report for this site dated September 6, 1995 and Table 2-3 on page 2-15 of this report, the soil that was left in place is significantly contaminated with lead, PCBs, and carcinogenic PAHs in some locations. EPA believes that the groundwater should be monitored for the contaminants that were detected both in the soil that remains as well as contaminants that were detected in the groundwater.

Response:

The decision-making framework will outline the identification of compounds to be monitored. For additional information on COC selection refer to the response to Comment 1.

Comment 6:

The plan documents where the monitoring wells to be used at DRMO will be located, the parameters to be measured, a schedule of monitoring frequency, and criteria with which to compare the groundwater data. The GMP should specify how long such monitoring will continue.

Response:

The decision-making framework will specify the rationale for monitoring or additional action.

Comment 7:

The GMP proposes one existing monitoring and one newly installed well adjacent to the river for downgradient monitoring and an additional well that will be installed just upgradient of the DRMO site. The wells will be screened in the shallow overburden and a low flow pumping technique will be used for sampling. Only one newly installed well will not establish baseline hydrological conditions. Could you use wells 6MW6D and 6MW6S in addition to 6MW9S? Monitoring wells 6MW2S and 6MW2D should be used to establish background conditions. Additionally, monitoring wells 6MW3D, 6MW8S, and 6MW4S should be used as installation of a few more monitoring wells may better characterize the site hydrology.

Response:

Wells 6MW8S AND 6MW4S no longer exist at the site and therefore, can not be included in the monitoring program. Wells 6MW1S, 6MW2S, 6MW2D, 6MW6S, 6MW6D, 6MW3S and 6MW3D will now be included. In addition, two new shallow wells (6MW9S and 6MW10S), a new deep well (6MW10D) will be installed.

Comment 8:

All water level measurements should be taken within the shortest possible time on the same day so that a water table map can be developed. The date and time that each measurement was taken should also be recorded.

Response:

These additional items will be added to procedures in the water-level measurement section of the GMP.

of the site. This area has not been excavated and sampling at 6TB22 and 6TB23 exhibited contamination with DDD, DDT, and other chemicals. Any contaminant migrating from this area to the Thames River would not be detected in 6MW10S. The Navy should install a shallow monitoring point in this area.

Response:

Additional shallow and deep monitoring wells along the perimeter of the DRMO will be proposed for sampling in the GMP (see response to Comment 7).

Comment 13b:

Please include deep wells. Contaminants have been detected in previous deep well samples showing the potential for contaminants to migrate to the Thames River through the deeper aquifer. EPA recommends that you also monitor the existing deep wells, 6MW2D and 6MW3D.

Response:

The sampling of deep wells 6MW2D and 6MW3D will be included in the GMP as well as the installation and sampling of a new deep well (6MW10D) adjacent to the proposed shallow well (6MW10S).

p. 1-2, §1.2

Comment 14:

Accurate baseline conditions cannot be established from one sampling event. Subtle variations in sampling methods, laboratory procedures, and seasonal effects between sampling events can result in analytical variances in the data. Typically, one year of quarterly sampling events is completed before baseline conditions are established. Monitoring aims to evaluate chronic conditions rather than acute. EPA therefore recommends that one year of sampling data be collected and evaluated before modification of any analytical parameters.

Response:

The GMP will be revised to include one year of quarterly sampling to establish baseline conditions.

pp. 2-5 to 2-10,
§§2.2.1 to 2.2.3

Comment 15:

Please provide a map indicating where the data were collected. This would provide a spatial relation of the contamination at the site.

Response:

Figure 2-4 provides the locations of the Phase I, FFS and Phase II sampling locations.

p. 2-11, §2.2.4

Comment 16:

Please include pre- and post-excavation maps showing the soil sample locations and excavation boundaries.

Response:

A new figure will be included in the GMP to indicate pre- and post-excavation sample locations as well as the final limits of the excavation.

p. 3-1, §3.1

Comment 17:

Please insert a downgradient well to the southwest of Building 397.

Response:

Existing well 6MW1S will be included in the groundwater monitoring plan.

- p. 3-5 **Comment 18:**
If the steel drive over box was also made water tight, the operation and maintenance of the well would be easier.
- Response:**
Figure 3-2 will be revised to reflect a watertight steel drive over box.
- p. 3-6, §3.2 **Comment 19:**
Please use the EPA Region I low-flow guidance dated July 30, 1996 (copy enclosed).
- Response:**
The updated guidance will be referenced in the text of the GMP and the guidance will be included in an appendix.
- p. 3-6, ¶2 **Comment 20:**
Well GWM10S is not depicted on Figure 3-1.
- Response:**
The well name will be corrected in the text to read 6MW10S.
- p. 4-1, §4.1.1, ¶2 **Comment 21:**
At a minimum, sampling should occur on a quarterly basis (see also p. 5-2, §5.2 and p. 5-4, §5.4). The CTDEP Remediation Standards require quarterly sampling periods (see 22a-133k-3, (f)(2)). Quarterly sampling schedules may be arranged to avoid the coldest months when it is possible for the wells to freeze (e.g., December, March, June, and September).
- Response:**
The GMP will be revised to indicate quarterly sampling periods.
- p. 4-2 **Comment 22:**
It is possible to achieve lower detection limits for vinyl chloride.
- Response:**
Detection limits for vinyl chloride (10 µg/L) are significantly below the Surface Water Protection Criteria (15,750 µg/L) and Federal and state Water Quality Criteria (525 µg/L).
- p. 4-4 **Comment 23:**
Please maintain SG-1.
- Response:**
SG-1 is no longer in existence.
- p. 4-6 **Comment 24:**
Calibration checks should be consistent with the EPA Region I low-flow guidance in addition to the manufacturer's recommendations.
- Response:**
The text will be revised to indicate that calibration checks will also be consistent with EPA guidance.

p. 5-1, §5.1

Comment 25:

In the first sentence, change "...confirm that contamination is not migrating..." to "...determine whether contamination is migrating...."

Response:

The text will be revised as indicated.

Comment 26:

Please delete the last two sentences of this section. As discussed during our meeting of August 8, 1996, the Navy can only waive the groundwater protection standards if CTDEP concurs. EPA is still waiting for such correspondence from the CTDEP.

Response:

The groundwater in the area of the DRMO is not accessible and the site is not likely to change in the near future. In addition, the GW classification is being changed to GB (see response to Comment 2). Analytical data for groundwater are being compared to CTDEP Surface Water Protection Criteria to be protective of the Thames River. These standards are applicable to a groundwater plume occupying more than 0.5 percent of the upstream basin of a stream. Because of the size of the Thames River and comparatively small amount of groundwater discharging from the DRMO these standards are being used as very conservative monitoring criteria.

p. 5-1, §5.2

Comment 27:

The GMP should specify that DRMO is located in a GA area.

Response:

The GMP will reference the CTDEP letter reclassifying the area as GB (see response to Comment 2).

Comment 28:

Is it the Navy's goal to attain surface water protection requirements? volatilization requirements? background concentrations?

Response:

The decision-making framework will include the goals of the monitoring program (see response to Comment 1). The goal is to attain surface water protection requirements for those contaminants determined to be above regional background and upgradient concentrations.

Comment 29:

Please discuss background groundwater concentrations and their use as monitoring criteria.

Response:

Proposed well 6MW9S, located immediately upgradient of the capped area of the DRMO, and existing wells 6MW10S and 6MW10D will be used to determine upgradient groundwater conditions prior to entering the site. This analytical data will be compared to the results of the groundwater data from the downgradient wells to determine if the DRMO is adding contamination to the groundwater before entering the Thames River and thus determine the effectiveness of the cap.

In addition, available inorganic regional background levels will be compared to groundwater analytical results to determine if the inorganics detected at the DRMO are within these levels. This discussion will be included in Section 5.2 of the GMP.

p. 5-2, 3rd bullet

Comment 30:

EPA recognizes that seasonal variation is anticipated. However, if a criterion is exceeded several times during a specific season or during the same season in different years, and if sensitive life stages are present at the same time, the cause of the exceedance must be corrected.

Response:

This is a CTDEP compliance statement for Surface Water Protection Criterion. The statement will not be changed.

p. 5-3, Table 5-1

Comment 31a:

This list was compiled based on previously detected groundwater contamination and is not complete. Please include all of the contaminants listed in Tables 11-6, 11-14, and 11-16 of the Phase II Remedial Investigation in the list of contaminants to be monitored. Also, state that if the list of COCs changes based on the groundwater data then this list may also change (see also p. 5-4, §5.3).

Response:

The decision-making framework will discuss the determination of contaminants to be monitored. Refer to response to Comment 1 for additional detail.

Comment 32:

EPA recommends that the federal marine AWQC acute value of 2.9 µg/L be substituted for the proposed value for copper of 48 µg/L. Since the downgradient monitoring wells are close to the shoreline and surface water, the likelihood of copper reaching the Thames River at acute concentrations must be considered. If copper is detected in downgradient wells above 2.9 µg/L, then surface water samples taken from the Thames River directly downgradient of the well should be analyzed for copper to evaluate potential effects to aquatic organisms.

Response:

Surface Water Protection Criteria will be used to evaluate the groundwater. AWQCs will only be used to screen contaminants and aid in the decision-making process. The decision-making framework will discuss the action levels proposed for comparison of the analytical data.

p. 5-4

Comment 33:

As noted above, the first sentence is not accurate.

Response:

The contaminants detected in the soil during the Phase II RI will be screened against CTDEP Pollutant Mobility Criteria for GB classified areas to determine compounds to be monitored. The groundwater contaminants of concern identified in the Phase II RI will also be monitored.

p. 5-4, §5.3, ¶1

Comment 34:

It is not clear how number 2 will be accomplished. ARARS have not been identified for this site.

Response:

The text will be revised to read "whether Surface Water Protection Criteria identified in Section 5.2 have been met".

p. 5-4, §5.3
& Table 5-1

Comment 35:

The chemicals of concern listed in Table 5-1 do not include all of the chemicals of concern in soil identified in the Phase II RI. Although PCBs and PAHs were not detected in groundwater samples at elevated concentrations during the Phase II RI, they were two of the three the contaminants that drove the Removal Action and should therefore be included.

Response:

Please see response to Comment 33.

p. 5-4, §5.3

Comment 36:

According to the GMP, sediment samples from the Thames River will only be collected "...if it is determined that there is a trend of increasing chemical concentrations in groundwater...." This does not appear to adequately assess the potential for adverse effects to the Thames River. The Phase II RI indicates that PAHs [benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene] are still present in soil at the DRMO and have been detected in Thames River sediment samples. Section 17.9.3 of the Phase II RI states that the results of the Thames River studies indicate that a sediment sample station located adjacent to the DRMO poses a potential risk to sensitive benthic invertebrates. In order to monitor the effectiveness of the cap and the risk to Thames River ecological receptors, EPA recommends that the GMP should establish a tiered approach to sampling, including sediment sampling of the Thames River and ecological evaluation.

Response:

This comment will be addressed in Section 5.0 with the decision-making framework. After the first year of sampling is complete, the results will be evaluated to determine if a change in the proposed monitoring regime is necessary or a response action is warranted. Once this baseline has been established, the monitoring program will be evaluated and modified as necessary to include additional sample points and/or media. Increasing trends or exceedances of monitoring criteria will prompt additional sampling (i.e., surface water/sediment sampling, additional groundwater sampling locations, etc.) and evaluation.

p. 5-4, §5.3, ¶13

Comment 37:

What statistical tests, if any, will be used to indicate changes in the data?

Response:

Statistical analysis will be utilized for the evaluation of the cap installed at the DRMO. It is crucial to show that the DRMO is not adding further contamination to the groundwater than already exists in the upgradient wells. When four rounds of groundwater data become available, a statistical comparison of upgradient and downgradient sample means at the 95% confidence level should adequately demonstrate the success or failure of the remedial technology. This methodology is consistent with the USEPA's Addendum to the Statistical Guidance Document for Groundwater Monitoring (1992). Statistics will only be performed for analytes which are detected in the downgradient wells.

Prior to performing statistical comparison between upgradient and downgradient analyte concentrations, the Shapiro and Wilk W-test will be performed for each analyte in order to determine if the data are normally or lognormally distributed. For analytes demonstrating the same distribution in the upgradient and downgradient wells, the parametric t-test will be employed for the mean comparison. If the W-test shows that the data do not adequately fit a normal or lognormal distribution, the nonparametric Wilcoxon Rank-Sum test will be employed. Both parametric and nonparametric tests will be run at the 95% confidence level. Corrections for seasonality should not be necessary since the geographic area containing the upgradient and downgradient wells is small enough such that seasonal fluctuations should affect all wells in a similar manner. Plots may be constructed using the moving averages of the upgradient and downgradient wells in order to support assumptions and conclusions.

p. 5-4, §5.4

Comment 38:

As stated previously, monitoring the groundwater thrice annually may not be appropriate.

Response:

The GMP will be revised to propose quarterly sampling.

Appendix B

Comment 39:

EPA's guidance has been updated (see the comment for p. 3-6, §3.2).

Response:

The updated guidance will be included as an appendix and referenced in the text.