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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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January 3, 2001

Mark Evans, Remedial Project Manager
U.S. Department of the Navy
Naval Facilities Engineering Command
Northern Division
10 Industrial Highway
Code 1823, Mail Stop 82
Lester, PA 19113-2090

Re: Technical Review Comments on the Round 9 Groundwater Monitoring Report for the Defense Reutilization and Marketing Office at the Naval Submarine Base-New London in Groton, Connecticut

Dear Mr. Evans:

EPA reviewed the *Round 9 Groundwater Monitoring Report for Defense Reutilization and Marketing Office*, dated December 2000. The report provides a brief overview of the site, a description of field activities involved in the ninth round of monitoring, and results of sampling and analyses from sampling performed in July 2000. EPA reviewed the report with particular attention to conformance with the Groundwater Monitoring Plan [1], the execution of the sampling round, the completeness of the documentation, and any indications of unexpected trends in contaminant concentrations.

The field activities and laboratory analyses reported in the document follow the Groundwater Monitoring Plan [1]. The monitoring program continues routinely.

The Groundwater Monitoring Report (GMR) provides a complete record of data collected in Round 9; water levels (Appendix C), field parameters (Appendix E), and the laboratory data sheets (Appendix G) are included. The dissolved oxygen data should be reviewed for indications of instrument errors, recording errors, *etc.* Additional discussion is provided in Attachment A.

No interpretation of the data is offered, as is the intent of the GMR. Interpretation is deferred to the annual report. The Round 9 data report does highlight exceedances, if detected, of primary and secondary monitoring criteria as adopted in the Groundwater Monitoring Plan. No exceedances of primary monitoring criteria were found; scattered exceedances of secondary criteria were encountered, principally among inorganic elements.

Detections of contaminants in exceedance of monitoring criteria appear to be sporadic. No exceedances of the primary criteria were found. A few relatively low-level exceedances of secondary criteria were detected. Although none of these exceedances is cause for alarm, it is

possible that most represent common fluctuations in groundwater conditions in what appears to be a fairly stable environment. Seemingly anomalous results for inorganics from one well, 6MW11D, may be associated with high turbidity, and therefore may not represent metals in solution in the groundwater. A brief summary and discussion of exceedances follows:

- Bis(2-ethylhexyl)phthalate exceeded the secondary criterion (5.9 μg/L) in three wells: 6MW1S (17.1 μg/L), 6MW2D (10.3 μg/L), and 6MW6D (18.1 μg/L). All of these wells had shown previous detections of this compound at similar magnitudes; all are near the lower historical values for the same wells. Five additional wells that historically have shown exceedances of the secondary monitoring criterion for this compound did not exhibit exceedances in Round 9.

- Arsenic exceeded the secondary criterion (0.14 μg/L) in four wells: 6MW2D (3.4 J μg/L), 6MW2S (3.4 J μg/L), 6MW10D (6.5 J μg/L), and 6MW11D (26.1 J μg/L). Most of these wells have exhibited exceedances in previous monitoring rounds at similar magnitudes, close to detection limits. The exception is 6MW11D, which had shown hits of 2.3 μg/L and 3.8 J μg/L in Rounds 5 and 6, respectively. Thus, the 26.1 J μg/L detection at 11D in Round 9 represents an increase of an order of magnitude over previous results. I note, however, that the water from this well suffered from elevated turbidity (52 NTU and increasing at the end of the purge), and it is possible that a significant fraction of the total arsenic is sorbed on particulates. The Round 9 analysis on this sample also indicates high iron (11100 μg/L) and manganese (1390 μg/L) relative to other groundwater from site wells. These results are also consistent with the high turbidity, and the possibility of particulates carrying iron and manganese oxides. The speciation of the arsenic, iron, and manganese at this well is speculative, given the contradictory indications of reducing conditions by ORP (-281 mV), but oxidizing conditions by DO (6.73 mg/kg) (see Appendix E).

  It should be noted that the secondary monitoring criterion for arsenic is considerably lower than the detection limits achieved by the laboratory (2.7 μg/L).

- Copper exceeded the secondary criterion (2.4 μg/L) in two wells, 6MW2D (7.8 J μg/L) and 6MW11D (32 J μg/L). Well 6MW2D had shown exceedances for copper in previous rounds (Rounds 1 and 5) at comparable levels. The exceedance at 6MW11D is the first among the nine completed monitoring rounds, and may be associated with the high turbidity of this sample. Copper is expected to sorb on iron and manganese oxides, which may comprise a significant fraction of the particulates. Six other wells that have exhibited elevated copper in previous rounds were below the secondary criterion in Round 9.

- Lead exceeded the secondary criterion (8.1 μg/L) in one well, 6MW11D (10.5 J μg/L). This is the first of the nine rounds where this well has shown an exceedance for lead. The

only lead exceedance in previous rounds was at 6MW2S (9.2 μg/L, Round 8), which was well below the secondary criterion in this round, at 1.9 UJ μg/L. The apparently anomalous lead hit in 6MW11D in Round 9 may be associated with the elevated turbidity encountered; lead is strongly sorbed on particulates.

- Silver exceeded the secondary criterion (8.1 μg/L) in one well, 6MW2S (20.5 μg/L). An exceedance of the secondary monitoring criterion for silver was noted at this well in Round 4, although at a somewhat lower concentration (4.3 μg/L). Three other wells that have shown exceedances for silver in previous rounds did not show exceedances in Round 9.

- Zinc exceeded the secondary monitoring criterion (81 μg/L) in three wells: 6MW9S (94.6 μg/L), 6MW10D (99.2 μg/L), and 6MW11D (108 μg/L). Wells 6MW9S and 6MW10D had shown persistent exceedances of zinc at similar and higher magnitude in previous rounds. The exceedance at 6MW11D was the first among the nine rounds of monitoring, and may be associated with the high turbidity of this sample (see related previous comments).

I look forward to working with you and the Connecticut Department of Environmental Protection to complete the remedial action at the Defense Reutilization and Marketing Office. Please do not hesitate to contact me at (617) 918-1385 should you have any questions.

Sincerely,

Kymberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachment

cc: Mark Lewis, CTDEP, Hartford, CT
Dick Conant, NSBNL, Groton, CT
Jennifer Stump, Gannett Fleming, Harrisburg, PA

ATTACHMENT A

Page	Comment
Appendix E	I note that there are indications of difficulties with the flow-through cell. In particular, the field data sheets for wells 6MW2D and 6MW10S show dissolved oxygen (DO) readings of 66.82 and 46.90 mg/L, respectively. These values are clearly erroneous, as the solubility of oxygen under these conditions is approximately 8 mg/L. These erroneous DO readings are also associated with extremely low ORP readings of -457 and -397 mV, which approach the lower limits for the stability of water. In addition, an apparent contradiction is seen in the data for well 6MW11D, which shows a strongly reducing ORP (-281 mV), but high DO (6.73 mg/L). This well also exhibited high turbidity, which may have fouled the electrodes. The flow-through cell should be inspected and calibrated carefully in future sampling rounds, and the data should be reviewed for indications of instrument errors, recording errors, *etc.* These data are important to developing an understanding of the concomitant analyses for concentrations of inorganic elements. For example, well 6MW11D showed anomalously high concentrations of arsenic and lead in Round 9, and the relationship of these anomalous data to the presence of particulates (high turbidity), high iron and manganese concentrations, and redox conditions is significant.

REFERENCE

[1] Brown and Root Environmental, "Groundwater Monitoring Plan for Defense Reutilization and Marketing Office, Naval Submarine Base, New London, Groton, Connecticut," February 1998.