



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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February 6, 2002

Mr. Orlando Monaco  
Department of Navy  
Engineering Field Activity-Northeast  
Code 1823/OM  
10 Industrial Highway, Mailstop 82  
Lester, PA 19113-2090

Re: Sites 1, 3 & Eastern Plume, Monitoring Event 18  
Naval Air Station, Brunswick, Maine

Dear Mr. Monaco:

The Maine Department of Environmental Protection (MEDEP) has reviewed the report entitled Monitoring Event 18-April/May 2001, Sites 1 & 3 and the Eastern Plume, dated January 2002, prepared by EA Engineering, Science and Technology. Based on that review the Department has the following comments and issues.

**General Comments:**

1. MEDEP will reserve comments involving more detailed analysis and comments on the implications of large-picture data interpretation for our review of the 2000 and 2001 Annual Reports. (NR)

**Specific Comments:**

2. Section 1.2.2, Results, p. 4, top:

"The depth of ground water during April 2001 at monitoring well EW-6 was 36.02 ft mean sea level, which indicates, at this time, that the ground-water potentiometric surface is rising above the bottom of the waste mass at this location (i.e., EW-6 as shown on Figure 5)."

EW-6 is the only well within the landfill containment that has a water level this high – above the base of the filled debris. The water level has been at this elevation since at least 1998, according to tables in prior monitoring event reports. Therefore, it is not correct to say that the water level is rising. EW-6 is screened from 17 to 41 feet below land surface, a substantially longer screen than those of nearby wells. In 1999, the Navy reported that the EW-6 well vault was found to contain standing water. It appears that this well is not representative of conditions within the landfill containment, and as stated on page 10 of this report, standing water was observed in the EW-6 vault. Possibly surface water is entering the well and creating a small groundwater mound at this location. The well and vault must be closely inspected for integrity, and repairs made as appropriate. (RR)

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3. Section 1.3.1, Field Activities, p. 4 and Table 5:

Extraction well EW-1 has been dropping substantially in remedial pumping rate during the past several years. In the summer of 1999 its extraction rate was approximately 11 gallons per minute (gpm). In April of 2001, the rate is given in Table 5 as 2 and 3 gpm prior to be taken off-line for redevelopment in May, which took 15 days to bring back on-line. As a result of the reduced pumpage from EW-1, its capture zone in Figure 7 appears to be less than 50-foot radius. As this is the only extraction well that addresses the southern end of the Eastern Plume, MEDEP is concerned that there has been very little hydraulic capture of the plume at EW-1. This scenario means that the chlorinated solvents in groundwater in the toe area of the plume may not be contained by remedial pumping, therefore, one of the objectives of the ROD is not being achieved. (As previously stated, the MEDEP does not believe that the plume is contained by natural geologic features, such as a bowl in the deep clay surface.) In the future, the Navy needs to be more diligent in maintaining the design pumping rate of remedial extraction wells. (RR)

4. Section 1.3.2, Water quality Indicator Parameter Measurements:

"It appears that the elevated turbidity reading may be a result of retrieving the diffusion samplers and reinstalling the sampling pump."

The Navy needs to actively seek to resolve this situation regarding the dual use of diffusion samplers and low-flow sampling by pulling and resetting a down-well pump. Although elevated turbidity is not known to affect chlorinated hydrocarbon concentrations, if samples for biologic attenuation are collected during the monitoring events, pumped water with elevated turbidity likely would pose a QA/QC issue. (RR)

5. Section 1.3.3.3, Comparison of Low-Flow Versus Aqueous Diffusion Collected Samples, p. 6, bottom bullet:

"Temperature and conductivity were higher in low-flow samples as opposed to diffusion samples for all wells."

These data verify that the low-flow pumping system significantly warms groundwater prior to temperature measurement acquisition at the surface. The amount of warming observed in the past has been over 5 degrees C. Such non-representative data should be distinctly qualified in future monitoring event reports. MEDEP recommends that temperature and conductivity be measured using the diffusion sampling technique, but cautions that warming of diffusion samples in the summer sun must be avoided. (ED)

6. Section 1.3.3.4, Ground-Water Extraction and Treatment System, p. 7:

"There were no elevated dissolved oxygen concentrations (9 mg/L) recorded in 3 or 4 active extraction wells sampled or in the combined effluent."

Please explain the importance of this comparison. In the past, dissolved oxygen levels in groundwater pumped from the extraction wells have been at or above oxygen saturation levels, as could be expected. (RR)

7. Section 1.4.1, Sampling Activities, p. 8:

Other sections of this report addressing sampling or field activities provide the numbers of samples taken of various types. This section does not. Please revise the text to provide the numbers of samples taken from the Eastern Plume and at Sites 1 and 3. (ED)

8. Figure 6, Interpreted Deep Ground-Water Potentiometric Surface Contour Map:

- (a) This figure shows contours south of Mere Brook oriented such that groundwater flow would be eastward or northeastward. MEDEP does not agree that deep groundwater flows this general direction, for the reasons given in our comments on "Summary Report of the Direct-Push Investigation of the Southern Boundary of the Eastern plume and Site 11, Naval Air Station, Brunswick, Maine – September 2001". This should be resolved so that this does not become a recurring comment. (MTG)
- (b) Potentiometric contours are shown surrounding all extraction wells except for EW-5A. Contours surrounding all extraction wells are displayed in Figure 7 in greater detail. It appears that EW-5A was overlooked in Figure 6. Please add these contours, as shown in Figure 7. (ED)

9. Figure 9, Interpreted Total Volatile Organic Compound Concentration Contour Map, Shallow Wells, Monitoring Event 18:

Concentrations of daughter breakdown compounds of the Eastern Plume parent compounds are higher at sentinel monitoring well MW-313 than in the past, but are not close to the MCLs/MEGs. Further comment will be provided when the 2001 Annual Report is distributed should this trend continue for Monitoring Event 19. (NR)

10. Figures 9 & 10, Interpreted Total Volatile Organic Compound Concentration Contour Maps, Shallow Wells and Deep Wells, Monitoring Event 18:

Some shallow and deep well total VOC results shown on these figures are entirely due to the laboratory-reported presence of the compound 2-butanone. At some of these locations, prior monitoring event contour maps have not shown any VOC detections.

In Appendix C (Analytical Data Quality Review), a statement near the bottom of page C-4 says that positive results for 2-butanone in MW-311, MW-332, MW-331, and MW-319 should be considered estimated with a high bias. On page C-9, another statement says that the results for 2-butanone in MW-225A (shallow and mid), MW-NASB-212 (shallow), MW-305 (shallow, mid and deep), and P-132 (mid) should be considered estimated. Table 13 indicates that the reason for this qualification is either accuracy or precision criteria assessment. Apparently, 2-butanone was not found in laboratory, trip, equipment rinsate, and field blanks. No mention of the 2-butanone finding occurs in the main text. However, the following statement in Section 1.6 might lead an outside reader not to question whether 2-butanone really exists in the subsurface groundwater: "The data obtained during the April 2000 sampling event were determined to be of sufficient quality to be used for the objectives specified in the Final LTMP (EA 2000a)."

MEDEP doubts that 2-butanone "just arrived" at numerous wells distributed throughout the Eastern Plume, a few of which are sentinel wells. From table A-3, 29 diffusion collected samples contained 2-butanone, with concentrations ranging from 3 to 8  $\mu\text{g/L}$ . None of the 29 low-flow collected samples were analyzed as containing 2-butanone. These statistics point to the diffusion bags as affecting the detection of this compound. The Navy needs to research this problem, and discuss a proposed solution with the technical team. (RR/MTG)

11. Table 7, Summary of Water Quality Indicator Parameters Measured in Low-Flow Samples, P-111 temperature:

The temperature of the sampled groundwater pumped from piezometer P-111 is reported at 4.31 °C. This temperature is a few degrees colder than normally expected. The next lowest groundwater temperature reported in this report is 5.53 °C at MW-332. Both the piezometer and the well are screened shallower than 20 feet bgs, and both are located between a stream and an extraction well. Possibly, cold surface water in the winter months served to recharge the shallow aquifer and migrated under pumping drawdown to the piezometer and well. (NR)

Thank you for the opportunity to review this report. If you have any questions or comments please call me at (207) 287-7713.

Respectfully,



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