



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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NAS BRUNSWICK  
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JOHN ELIAS BALDACCI  
GOVERNOR

DAWN R. GALLAGHER  
COMMISSIONER

January 30, 2004

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 22  
Naval Air Station, Brunswick

Dear Mr. Monaco:

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft report entitled Monitoring Event 22 Report-April/May 2003 for Sites 1 and 3 and Eastern Plume, dated December 2003, prepared by EA Engineering, Science and Technology. Based on that review MEDEP has the following comments and issues.

**General Comments:**

1. A table of references is missing from this draft report. The final report needs to provide a reference list. The Navy should update the draft Diffusion Sampler Proposal (EA 2003) to a "final report" if the ME-22 final is released after the Diffusion Sampler Proposal is released as a final (page 2 reference). (ED)
2. A number of contaminant trend graphs in Appendix C.4 are virtually useless because the y-axis scale (concentration) is not compatible with the historic range in concentration. Two good examples of this problem are Figures 128 and 131. The relatively very large range in arsenic concentration forces the other 10 contaminants onto the zero line, and visually one can only see a trend for arsenic. The obvious solution for these two graphs is to move arsenic onto the manganese graphs, which have comparable scales. (ED)

**Specific Comments:**

3. Section 1.2, Long-Term Monitoring Program, p.3, 1<sup>st</sup> paragraph:

"The LTMP has been revised (February 2000) based on previously collected data."

Since February 2000, the incorporation of diffusion sampling has changed the array of samples being collected. It should be mentioned that the final diffusion sampler proposal will be used to update the LTMP. (ED)

AUGUSTA  
17 STATE HOUSE STATION  
AUGUSTA, MAINE 04333-0017  
(207) 287-7688  
RAY BLDG., HOSPITAL ST.

BANGOR  
106 HOGAN ROAD  
BANGOR, MAINE 04401  
(207) 941-4570 FAX: (207) 941-4584

PORTLAND  
312 CANCO ROAD  
PORTLAND, MAINE 04103  
(207) 822-6300 FAX: (207) 822-6303

PRESQUE ISLE  
1235 CENTRAL DRIVE, SKYWAY PARK  
PRESQUE ISLE, MAINE 04769-2094  
(207) 764-6477 FAX: (207) 764-1507

4. Section 1.2, Long-Term Monitoring Program, p.3; bullets:

This section should cite the goals of the Long Term Monitoring Plan based on the Record of Decision and then evaluate the effectiveness on those goals. Please rewrite this section. (ED)

5. Section 1.3.1, Gauging Activities, p. 4, 2<sup>nd</sup> paragraph:

MEDEP notes that 1.88 inches of precipitation was received just prior to water-level measurements. This is a greater amount than normally received, and may have affected some monitoring wells. (NR)

6. Section 1.3.2, Results, p. 4, 1<sup>st</sup> paragraph:

"However, MW-309B, a shallow bedrock well, is currently considered to be representative of the deep flow system, and is included on deep potentiometric surface maps (Figure 7)."

This first part of this statement is correct, although the key word is "currently". The problem is that Figure 7 (Interpreted Deep Groundwater Potentiometric Surface Contour Map) in this report shows MW-309A, not MW-309B. This is apparently because MW-309B was reported as "artesian", implying a groundwater head above the top of the well riser. The correct map entry is 22.32<sup>+</sup>, as measured in the MW-309B well. Please revise the figure and add a footnote in the legend to explain the plus sign after the elevation.

7. Section 1.4.1, Sampling Activities, p. 5, 4<sup>th</sup> paragraph:

a.) "Note that 1 monitoring well (MW-205) was not sampled during Monitoring Event 22 due to field error. The aqueous diffusion sampler was placed in a nearby monitoring well accidentally during deployment."

MEDEP notes that this is the second monitoring event in sequence that contaminant data for MW-205 was not obtained. This cannot continue. This location within the Eastern Plume is important because both TCE and 1,1,1-TCA remain at relatively high concentrations. In the future, the contractor needs to ensure that the monitoring plan is adhered to and the Navy needs to notify the regulators in a timely manner when it is necessary to deviate from the monitoring program because it may be necessary to resample immediately and not wait until the next monitoring event. (RR)

b.) "This well will be sampled and gauged in Monitoring Event 23."

Please delete the last sentence in the paragraph as sampling MW-205 in Event 23 is the required protocol.

8. Section 1.7.1, Inspection Activities, p. 9, bullets:

"These conditions should be corrected before the next sampling event is completed."

MEDEP is interested in how many of the five listed needed improvements were completed by or at the time of the fall 2003 monitoring event. (RR)

9. Graph of Monthly GWETS VOC Removal Rate, p. 12 and paragraphs 1-3:

a.) The trend line of monthly VOC removed dives to a near-zero reading in January 2003. The Navy apparently cannot explain this ("may possibly be due to sampling or laboratory issues"). MEDEP notes that a similar result occurred for July 2001, without explanation. The monthly GWETS reports for these two dates indicates no appreciable change from prior and subsequent plant influent concentrations. Therefore, MEDEP concludes without further research that the graph on page 12 contains erroneous data for these dates. Please confirm and correct the graph trend lines, and the text as appropriate. (RR & ED)

b.) "The removal rates show significant decrease from the pre-October 2002 data, likely due to decreasing concentrations of VOCs at EW-02A since this well was installed in 2000."

The graph for EW-02A does not support this statement (see Figure 5, Appendix C.4). Please re-assess the cause of the decrease in concentrations. (RR)

c.) "As shown in the graphic above, the sum of the monthly VOCs removed reached 11.7 kg from the Eastern Plume between October 2002 and April 2003. The cumulative VOC rate removed from the Eastern Plume since the extraction system began operating is approximately 411 kg."

The graph cannot be readily read by the reader to verify that 11.7 kg is correct, as it does not show the summation for this 6-month period. Please insert a monthly table of values for this 6-month period to support the 11.7 figure. Also, change "cumulative VOC rate" to "*cumulative VOC mass*". (ED)

10. Section 2.1, Groundwater Extraction and Treatment System Performance Summary, p. 12, bottom paragraph:

"The long-term reduction of VOC removed by the treatment plant suggests that the highest concentration areas of the Eastern Plume have been effectively targeted by extraction wells, and VOC concentrations in the plume have been significantly reduced."

While over 400 kg of VOCs have been removed, the amount remaining is substantial. Two notable locations of high concentrations (greater than 1 ppm) presently exist that seem to remain unaffected by the extraction well system: these locations are MW-331 and P-106. MW-205 is a third locality that appears to have been only lightly impacted by years of pumping. MEDEP believes that considerably more VOCs can be removed by optimization and reconfiguration of the extraction network, which was discussed at the January 2004 Technical Meeting between the Navy, EPA, BACSE, and MEDEP. It is MEDEP's understanding that the Navy will be developing a workplan to address optimization of the extraction system and additional technical meeting will be scheduled to expedite workplan and installation of the extraction wells. (NR)

11. Section 2.3.1, Sites 1 and 3 – Volatiles, p. 14, 3<sup>rd</sup> bullet, MW-217B:

"Historically, this well does not yield water and a low-flow sample was not collected from this location during Monitoring Event 22 due to a lack of appreciable water in the monitoring well."

The graphs in Appendix C.4 show that both inorganics and volatiles have been collected nearly every event. The lack of sufficient yield appears to be a recent development. Very likely, the well needs to be cleaned and redeveloped. Please add MW-217B to a list of wells that need maintenance work prior to the upcoming spring monitoring event. (RR)

12. Section 2.3.2, Sites 1 and 3 – Inorganics, p. 15, 2<sup>nd</sup> bullet, MW-203:

“A low-flow sample was collected from this location and sent to the laboratory but was not run due to a laboratory equipment malfunction.”

According to the inorganic trend graphs in Appendix C.4, inorganic results were obtained. It appears that the malfunction only prevented volatile analysis. Please confirm and, if necessary, delete this statement from this section. (ED)

13. Section 2.3.2, Sites 1 and 3 – Inorganics, p. 15, 3<sup>rd</sup> bullet, MW-217B:

“Therefore, the lack of available groundwater at this sample is not unexpected.”

In Monitoring Event 20, April 2002 the pre-purging water level was recorded at 29.20 feet below the top of the riser (Table 3). This measurement translates to 3.7 feet of water in the bottom of the well. The field record of well purging and sampling for MW-217B in the ME-22 report (Appendix E.2) indicates that liquid was not detected in the well, but the well depth was not confirmed at the time. Comparison of groundwater elevations between April 2002 and April 2003 shows that levels were approximately a half foot lower in April 2003. Therefore, liquid should have been detected in MW-217B in April 2003. If the field measurement was made properly then the well may need to be cleaned and/or re-developed. Please add this well to a list of wells that may need maintenance work prior to the upcoming spring monitoring event. (RR)

14. Section 2.3.3, Eastern Plume – Volatiles, p. 17, 2<sup>nd</sup> bullet, MW-205:

“Historical trends of the other volatiles show similar low concentrations.”

The similarity of the other volatiles to TCE and 1,1,1-TCA while comparable in concentrations, can not be called “low” when in the range of 100 µg/L. TCE at 100 µg/L is 20 times the MCL/MEG. Because MW-205 has not been sampled the last two events, all reference to recent decreasing trends must be removed to avoid implications that the current trend is known. Please remove all extrapolations of concentration trends. (ED)

15. Section 2.3.3, Eastern Plume – Volatiles, p. 17, bullets 3-5 & p. 18, 1<sup>st</sup> bullet:

The apparent non-detect for MW-229A in Figure 50 of Appendix C.4 is believed to have been swapped with another well during field collection (Fall 2001) per the graph explanation. In addition the total VOCs have not been non detect for monitoring wells MW-207AR, MW-225A, MW-229A, and MW-306. Therefore the phrase “including total VOCs” found in these bullets is not correct. (ED)

16. Section 2.3.3, Eastern Plume – Volatiles, p. 18, 4<sup>th</sup> bullet, MW-319:

“Total VOC concentrations, including the previously detected compounds trichloroethene and tetrachloroethene, have declined to non-detect, which is a historic low for this monitoring location.”

The graph of trends at the well (Figures 104 plus 107, Appendix C.4) would suggest that the complete sudden disappearance of all target VOCs at the same time is an extreme occurrence. Only the bottom of the well screen was monitored with a single diffusion sample, as approved by the stakeholders. The deep zone VOC concentration contour map (Figure 10) has changed significantly from previous event maps due to this apparent development. It is difficult to conceive that all contaminants dropped to non-detect in May

2003, while MW-225A (about 300 feet distant and farther away from the plume axis) only experienced relatively small declines in concentrations. If the MW-319 data are truly representative of this location, groundwater movement and pumping effects are not well understood and the Navy needs to provide an explanation for this abrupt change in plume configuration. (RR)

17. Section 2.3.3, Eastern Plume – Volatiles, p. 19, Other Monitoring Wells:

Please make the following changes to the list of "Other Monitoring Wells" in this paragraph: a) delete MW-331 (it is discussed on page 18), and b) delete the "B" from MW-330. (ED)

18. Section 3.1 General Conclusions and Recommendations, p. 25 - 26:

a.) First Bullet - MEDEP agrees with the conclusion that a detection of TCE at this concentration in surface water strongly suggests that the Eastern Plume is discharging contaminants into Mere Brook at this locality. The Navy's recommendation is also appropriate. If the next monitoring event has a similar result, the Navy and stakeholders will need to discuss additional surface water sampling to identify the total affected reach of the stream, so as to estimate the volume of discharge. The close by monitoring well (MW-313) has experienced increasing concentrations of 1,1-DCE and 1,1-DCA, which also heightens interest in this area of the Eastern Plume. (MTG)

b.) Second Bullet - MEDEP agrees with the concern expressed, and is further concerned now that PCE is present at P-111 (at a concentration between the MEG and MCL) where it was not detected previously. The screen of P-111 is very shallow (2.5 to 7.5 feet bgs), and the appearance of VOCs in this well has significance that needs to be investigated. Whereas the Navy expresses concern that the contamination at MW-331 and P-111 may move into the EW-02A area, an additional possibility is that the plume may spread beneath or into Merriconeag Stream north of EW-02A. This topic was discussed at the Technical Meeting held January 26, and 27, 2004 and MEDEP will look closely at the data for this piezometer in Monitoring Event 23 and other upcoming monitoring events. (NR)

c.) Third Bullet - Recent plume concentration data does appear to indicate that the plume terminus is spreading eastward toward MW-313 more so than southward in the last year. Such a shift in migration may be the result of decreased extraction well pumping in the last several years, perhaps in combination with a return to more normal annual precipitation. However, prior to obtaining chemical analyses from the new monitoring wells (MW-338A,B,C and MW-339), no conclusions can be drawn regarding plume extent along the southern edge. Without these data and more interpretative analysis, the conceptual model should not be updated, because the current suggested direction of plume migration may represent a transient phase. (NR)

d.) Fourth Bullet - MEDEP does not agree that contaminant concentrations associated with the Sites 1 and 3 landfills have changed significantly enough to consider reducing the monitoring locations or frequency. Arsenic and sodium concentrations in groundwater and seep leachate have risen substantially at some monitored locations. No long-term decreasing trends in 1,4 dichlorobenzene at MW-217B and Leachate Seep-09 are evident from the graphed data in Appendix C.4. Downgradient of the landfills at MW-240, chromium and nickel concentrations have actually increased since 1999. It has been apparent for years that some contaminants originating in the landfills have been escaping from the partial confines of the slurry wall. The possibility for future chemical releases within the landfill and subsequent downgradient migration cannot be dismissed. (RR)

19. Section 3.1.1, Extraction System, p. 26 - 27:

- a.) First Bullet - MEDEP agrees, in principle, with the conclusion and recommendations, however as stated in earlier comment letters, the extraction system must be optimized and the data collected to validate the potential for natural attenuation. (NR)
- b.) Second Bullet - The abandonment of EW-01 is accepted as a valid point for discussion. It is somewhat at odds with the recommendation in the first bullet to just reduce pumping at EW-1. (NR)
- c.) Third Bullet - The maintenance of the landfill cover should be implemented "automatically" without elevating these minor deficiencies to this report section for stakeholder concurrence. (RR)

20. Section 3.2, Long-Term Monitoring Goals, p. 27 - 28:

- a.) First Bullet - MEDEP endorses the proposal to increase monitoring in the SW-12 area. The meaning of the phrase "...at the majority of Sites 1 and 3 and the Eastern Plume" is unclear. Our interpretation and belief is that the existing monitoring network is adequate in most areas of these sites, however as with any long term monitoring plan the program must be refined to reflect changes within the plume. (RR)
- b.) Second Bullet - This goal is very important, and captures the essence of the long-term monitoring program, but until the evaluation process is undertaken in detail it is really not known if the data currently being collected are adequate to evaluate the effectiveness of the extraction system. (RR)
- c.) Third Bullet - The same observation as stated in the second bullet applies. The recommendations for system improvement in Section 3.1 involve only consideration of reducing sampling locations and frequency. Such changes seldom improve evaluations of the effectiveness of a remedy. The description of this valid goal needs to be presented differently. (ED)
- d.) Fourth Bullet - Until the evaluation process is undertaken in detail it is really not known if the data currently being collected are adequate to evaluate the degree of hydraulic control. (RR)

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

Respectfully,



Claudia Sait  
Project Manager-Federal Facilities  
Bureau of Remediation & Waste Management

Cf: File  
Larry Dearborn-DEP  
Anthony Williams-BNAS  
Christine Williams-EPA  
Carolyn Lepage-Lepage Environmental  
Al Easterday-EA  
Ed Benedikt