



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND - REGION I
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BOSTON, MASSACHUSETTS 02114-2023

January 23, 2004

Lonnie Monaco (monacolj@efane.northdiv.navy.mil)
Engineering Field Activity Northeast, Naval Facilities Engineering Command
Code 1821/LM
10 Industrial Highway, Mailstop 82
Lester, PA 19113-2090

Re: *Monitoring Event #22 Report for Sites 1,3 & the Eastern Plume Long Term Monitoring, dated November 2003, Naval Air Station Brunswick, Maine*

Dear Mr. Monaco:

Pursuant to § 6 of the Naval Air Station Brunswick, Maine Federal Facility Agreement dated October 19, 1990, as amended (FFA), the Environmental Protection Agency has reviewed the subject document and comments are below:

General Comments:

1. Event 22 sample collection and analysis was carried out successfully. Results are generally consistent with recent trends (see, e.g., Appendices C.3 and C.4), particularly for VOCs. Notable increases were found at two mid-plume points, MW-331 (continuing an overall increasing trend since 1999) and P-111 (where 1,1,1-TCA has risen to detectable levels (maximum 4 micrograms per liter) in the last two rounds), as acknowledged in the report. Increases in concentration at leading-edge locations, including surface water (first-time detection of TCE at SW-12), were also recorded, again acknowledged in the report (see p. 25, sec. 3.1).

2. The recommendations (sec. 3) are sound; in particular:

- Additional surface-water sampling downstream of SW-12 is well motivated to provide further constraints on possible southward migration of the plume and associated discharge to surface water.
- It is agreed that the original goal of containment (hydraulic control) of the plume by means of the groundwater extraction system appears to be less compelling at this time, as the plume is bounded to some extent by natural groundwater divides along the surface drainages at which groundwater discharges upward to the brooks. The pump-and-treat system is perhaps more successful in accomplishing mass reduction, and thus shortening the overall cleanup time for the plume. A notable success is EW-2A, which has dramatically reduced the total VOC concentrations at MW-311 immediately downgradient.
- It is agreed that EW-01 may be inducing upward flow from the deep contaminated interval to the shallower aquifer. Abandonment of this extraction well is prudent, and the recommendation to utilize the treatment capacity elsewhere is sound.

Specific Comments:

3. p. 23, sec. 2.4.3.1, first bullet: Please check units. VOC concentrations in sediment are given in micrograms per kilogram, as shown correctly in the second bullet in this section.

4. p. 23, sec. 2.4.3.2: Please check units for all analytical results summarized in this section. The inorganics concentrations in sediment are given in mg/kg.

5. Table 8: Please note that the DO measurement for MW-309B is entered as 298 mg/L. The field data sheet (App. E.2) shows that the value recorded was 2.98 mg/L.

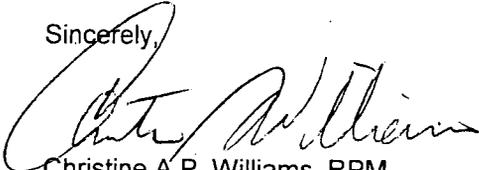
6. App. B, Data Summary Tables: Please check units stated for various analytes in the data tables. In particular, the following entries appear to be inconsistent:

- Table B-11: The NOTE section at the end of the table states that organic analytes in sediment are reported in micrograms per kilogram (mg/Kg). The text is correct, but the abbreviation should be that for micrograms (i.e. Greek "mu") rather than milligrams.
- Table B-12: The NOTE section states that inorganic analytes in sediment are reported in micrograms per kilogram (mg/Kg). The text should read "milligrams" rather than "micrograms;" the abbreviation is correct.
- Table B-13: The NOTE section states that inorganic analytes in sediment are reported in micrograms per liter, and the abbreviation given is that for micrograms per kilogram. The text should read "milligrams per kilogram," and the corresponding abbreviation should be "mg/kg."
- Table B-15: The NOTE section states that TOC results for sediment are reported in micrograms per liter, and the abbreviation given is that for micrograms per kilogram. Based on the laboratory data sheet included in App. H.8, the units in this table are micrograms per gram, or, equivalently, milligrams per kilogram.

EPA is willing to discuss and finalize responses to these comments with all parties at the technical meeting in January or during a regularly scheduled conference call after a draft response is reviewed.

I have also included an evaluation of the event 20 final document as an FYI. If you have any questions with regard to this letter, please contact me at (617) 918-1384.

Sincerely,



Christine A.P. Williams, RPM
Federal Facilities Superfund Section

Enclosure

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EPA Evaluation of ME#20 data

General Comments:

1. Event 20 sample collection and analysis was carried out successfully. Results are generally consistent with recent trends (see, e.g., Appendices C.3 and C.4), particularly for VOCs.
2. It is noted that the DO and ORP measurements collected in conjunction with the diffusion sampling and the low-flow sampling show very large disparities in many cases. Given the importance of the redox indicators to the forthcoming natural attenuation assessment, some discussion should be held concerning the best protocol to follow in order to obtain reliable and self-consistent field parameters.
3. As noted in a recent review of the Event 21 report, inorganics results for all media are somewhat erratic, possibly due to turbidity in some groundwater and surface water samples, and iron floc in leachate water samples. Sediment analyses may be variable because of variable floc content, as well. An extreme example is the water sample from leachate seep SEEP-09, which exhibits turbidity of 187 NTU, iron at 2560 mg/L, and arsenic at 12.4 mg/L. Event-to-event comparisons or assessments of trends are probably not meaningful for samples that may reflect principally the particulate content. Field filtration of the seep water samples should be considered in order to provide a more consistent sample quality from event to event.
4. The recommendations (sec. 3) are sound. The second bullet in section 3.1 recommends that diffusion sampling be made a permanent part of the LTMP. The suggested discussion with regulators should include discussion of the best methods to replace the data for field parameters (e.g., ORP, pH, DO) obtained routinely as a part of the purge in low-flow sample collection. These data are taking on increasing significance because of the interest in natural attenuation of the VOCs.

Specific Comments:

5. **p. 6, sec. 1.4.2:** The DO and ORP measurements performed in conjunction with the diffusion sampling and with the low-flow sampling show some significant discrepancies. Particular examples include MW-318; ORP measured downhole following removal of the diffusion sampler was -154 mV; that measured at the end of the low-flow purge was +300 mV. Also, for MW-334, the downhole measurement was -268 mV, and the low-flow measurement was +232 mV. Similarly, for MW-334, the downhole measurement gave -268 mV, and the low-flow measurement yielded +232 mV. The DO data are generally more comparable by the two methods, although there are a few discrepancies (e.g., MW-230A, with 4.34 mg/L in the wellbore, and 0.4 mg/L at the end of the purge). However, it is noted that, in many cases, the low

EPA Evaluation of ME#20 data

DO is difficult to rationalize with high ORP (e.g., MW-332, for which the downhole ORP was +226 mV, and DO was 0.32 mg/L; similarly, MW-319, for which the downhole ORP was +237.4 mV, and DO was 0.74 mg/L). These differences could arise from a number of sources, including: genuine differences in the redox conditions in the wellbore after removal of the diffusion sampler and in the aquifer (as drawn to the well during the low-flow purge); the common uncertainties associated with both ORP and DO field measurements; faulty instruments; etc. With regard to the last, the field record (App. E.2) for MW-218 notes that the instrument was switched out in the middle of the purge. At the time of the switch, the recorded ORP jumped from -151 mV to +160 mV. Furthermore, it is noted that a startling number of the wells sampled show ORP in the neighborhood of +160 mV, and the readings taken during as much as two or more hours of purging are unusually stable (see, e.g., MW-207AR, at which the ORP varied between 151 and 160 mV throughout the entire purge). Given the importance of the field parameters to the forthcoming natural attenuation assessment, particular attention should be given to the reliability of the field instruments, the calibration, and the recording of the field data.

well	ORP (mV)		DO (mg/L)	
	low-flow	aq. diff.	low-flow	aq. diff.
224		-71		9.75
231B	251	121	9.69	15.28
318	300	-154	7.24	5.84
332		226		0.32
1104	166	194	0.59	2.49
205		22		6.45
207AR	156	151	0.13	0.31
225A	161	85	4.44	5.67
229A		172		7.46
230A	-59	267	0.4	4.34
231A		205	9.58	10.89
303	-63	93.6	0.8	4.13
305	349	33.5	0.79	0.23
306		193		5.54
311		188		1.68
313	224	-171	0.57	1.18
319		237.4		0.74
330	159	-17	1.26	1.96
333	-68	-119	0.26	0.56
334	232	-268	0.69	1.4
308	-73	64	1.14	3.17

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309B	158	136	1.09	1.8
P-111	155		1.91	
P-132	503	151	11.17	11.28
P-106	220		5.04	

6. p. 12, sec. 2.2: It appears that the water level recorded for EP-20, inside the slurry wall at Sites 1 and 3 is in error. Figure 6 attempts to contour this anomalously high water level. Table 3 shows a water level of 41.84 ft msl. The water-level trend shown in App. A, Att. A shows (with the benefit of subsequent measurements) suggests that the recorded depth to water is off by 10 ft. Extreme anomalies such as this should be acknowledged in the text in future reports.

7. p. 17, sec. 2.3.3: The well-by-well discussion does not include a review of results for MW-331, which exhibited the second-highest total VOC concentration in the Eastern Plume in the reporting period (e.g., 1,1,1-TCA at 330 D micrograms per liter). Please include this well in the discussion for future reports.

8. p. 22, sec. 2.4.3.1, second bullet: The range of VOC concentrations is cited in units of milligrams per kilogram, rather than micrograms per kilogram. Please check for consistency.

9. p. 23, sec. 2.4.3.2, third bullet: The range of inorganic concentrations for LT-05 is cited in units of micrograms per liter, rather than milligrams per kilogram (mg/kg). Please check for consistency.

10. App. B, Table B-11: The first NOTE states that the units are milligrams per kilogram. However, the laboratory reports (App. H.6) show that the VOC concentrations are given in micrograms per kilogram. Please check table footnote for consistency.