

**RESPONSE TO COMMENTS FROM  
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION  
ON DRAFT 1997 ANNUAL REPORT MONITORING EVENTS 8 THROUGH 10  
SITE 9: NEPTUNE DRIVE DISPOSAL SITE  
BRUNSWICK NAVAL AIR STATION**

**COMMENTOR:** Claudia Sait

**DATE:** 28 August 1998

**General Response to Comment:** The Final 1997 Annual Report for Site 9 has been issued based on response to comments as listed below. These changes focused on correcting errors identified in comments. The figures and graphs have not been revised in the Final 1997 Annual Report. The 1998 Annual Report included the changes to report figures and report content.

**SPECIFIC COMMENTS**

1. The black triangle indicating Site 9 does not represent the site properly. The Department suggests adding an open black box that encompasses the entire area of investigation. That area should be the same as Figure 1-2, unless more precise site boundaries have been determined for the Final ROD.

*Response*—The Navy agrees that the black triangle indicating Site 9 does not represent the site completely. The site map in the 1998 Annual Report and for subsequent reports has been revised to include a more precise site extent.

2. *Purpose, Section 1.2.1, Page 1-2, Bullets*—A bullet needs to be added that gives importance to assessing variations in ground-water flow paths at Site 9, through contouring of water table elevation measurements in monitoring wells. The Department believes that flow path change has/is occurring as a result of the construction of impoundment ponds in the Site 9 discharge area. Evaluation of the natural attenuation remedy will depend on cognizance of such variation as it may affect the ground-water chemistry at each monitoring well.

*Response*—Comment noted. The following has been added as the last bullet to Section 1.2.1 of the Final 1997 Annual Report:

*Assess variations, if any, in the ground-water flow paths through contouring of water table elevation measurements in monitoring wells and surface water gauge stations.*

3. *Objective, Section 1.2.2, Page 1-2*—The title of this subsection does not accurately reflect its contents. The objectives of long-term monitoring were covered in Section 1.2.1, Purpose. Another title should be chosen that is more indicative of the text.

*Response*—Subsection 1.2.2 has been renamed “Regulatory Requirements” in the Final 1997 Annual Report.

4. **Background Wells, Section 1.2.3, Page 1-2**—This section is too brief, and does not reference any tables, figures, or later application to the present evaluation. It needs to be enhanced.

**Response**—A reference to summary Table 1-1 has been added in the Final 1997 Annual Report. Note that this section was not included in the 1998 Annual Report.

5. **Hydrogeology, Section 2.3, Page 2-2, 2nd Paragraph**—The recent construction of the surface water impoundment ponds appears to have affected water elevations immediately adjacent to these waterbodies but has not affected overall ground-water flow patterns at the site.

Realizing that for this report the pertinent conditions are those characterizing the site between Monitoring Event 8 and 10, the Department is concerned that the above statement may be found to be inaccurate, particularly if Monitoring Event 12 data support Monitoring Event 11's water table contour map (MEDEP interpretation). The ponds probably have not significantly altered the "overall ground-water flow pattern at the site" (i.e., southeastward flow), but seemingly have caused bending of flow eastward near Building 201. The Department suggests,

*The recent construction of the surface water impoundment ponds appears to have affected water elevations adjacent to these bodies, but longer-term ramifications of this change on the flow pattern in the downgradient part of Site 9 are presently unknown.*

**Response**—The Navy has modified the sentence as follows:

*The recent construction of the surface water impoundment ponds appears to have affected water elevations ~~immediately~~ adjacent to these ~~water~~ bodies; the long-term effects of this potential change to the ground-water flow pattern at Site 9 will be assessed in future annual reports.*

6. **Results of Previous Investigations, Section 2.4, Page 2-2, 2nd Paragraph**—Media being monitored as part of the Long-Term Monitoring Program include ground water, surface water, sediment, and seeps.

This sentence would be more appropriate at the end of the first paragraph.

**Response**—The Navy agrees that the sentence is more appropriate at the end of the first paragraph. The sentence has been moved as requested.

7. **Results of Previous Investigations, Section 2.4, Page 2-3, 1st Paragraph**—Extensive previous investigations have not defined a specific source for the presence of VOC in ground water.

Per correspondence in 1998, the Department believes that the source of VOC contamination is likely located upgradient of what has been defined as Site 9, and this area was not extensively investigated. The following language is recommended:

*Previous investigations of Site 9 have not defined a specific source that explains the presence of VOC in ground water.*

**Response**—The Navy has modified the sentence as recommended.

8. **Results of Previous Investigations, Section 2.4, Page 2-3, 1st Paragraph**—Elevated concentrations of inorganic analytes in ground water have been attributed to natural site background concentrations.

The use of “site” is ambiguous here. The Department does not support attributing all exceedances to natural background levels (whether site means BNAS as a whole or Site 9), but does recognize that runway and street runoff (i.e., non-point sources) are probably responsible in some instances. This subject needs to be more clearly developed in the text.

**Response**—The word “site” refers to Site 9, the subject of the report, and does not imply all ground water at NAS Brunswick. This text has been removed and the bullets in Section 2.4 are believed to fully summarize site contamination issues.

9. **Table 2-1**—Two of the background wells included in this table should be eliminated for this network. MW-801 has a history of producing turbid water samples (200 NTUs) even though the low-flow rate is 100 ml/min. Some inorganic concentrations are quite high (Al, Fe, Zn). Of direct concern to Site 9, MW-NASB-020 has very low dissolved oxygen values (<0.5 mg/L). This condition is likely the result of the well being located within an oxygen-deficient plume caused by upgradient fuel degradation at the NEX. Under the unnaturally strong reducing subsurface environment immediately upgradient of MW-NASB-20, metals attached to soil particles will tend to dissolve into ground water, and produce concentrations far above natural background levels. Low-flow sampling is currently at a rate of 300 ml/min, but will not mitigate this problem if lowered.

The Department would like to place this topic of background well review on the agenda for the next RAB meeting.

**Response**—The fact that MEDEP has questioned the appropriateness of these monitoring wells (MW-801, MW-211B, and MW-NASB-020) has been noted in Table 2-1 of the Final 1997 Annual Report. We agree that low dissolved oxygen in MW-NASB-020 is likely related to fuel degradation and, therefore, this monitoring well may not represent background ground-water conditions.

10. **Results of Water Level Gauging Program, Section 3.1.2, Page 3-2, 2nd Paragraph**—...overburden ground water in the vicinity of Building 201 discharges to the northern and southern branches of the unnamed stream.

The Department agrees that at least part of that flow path discharges to the northern branch. Without having pond elevations at the time of the monitoring events, the question of discharge to the southern branch cannot be definitively answered. Our current interpretation is that flow past Building 201 may now skirt around the upper pond. If you have pond elevations, include them in this report and describe how they support discharge to the southern branch. If pond elevations have not been measured, MEDEP suggests that the text be revised to exclude the southern branch; or else such an interpretation be heavily qualified.

**Response**—Pond elevations were not available at the time of this report, however, they have since been collected. The Navy agrees that ground-water flow past Building 201 may now skirt around the upper pond based on some gauging data, although flow towards the upper impoundment pond is not uncommon. The text has been revised as shown below to exclude identification of the southern branch as requested and notes flow to the northern branch is dominant:

*Overburden ground water discharges to the unnamed stream, as indicated by localized ground-water flow toward the stream branches from the north, southwest, and south. Based on interpretation of well gauging data, overburden ground water discharges to the northern branch of the unnamed stream from the vicinity of the ash landfill/dump area, and from the vicinity of Building 201.*

11. **Description of Ground-Water Monitoring and Sampling Program, Section 3.2.1, Page 3-3, 1st Paragraph**—Stabilization of water quality parameters was achieved when three consecutive measurements were within 10 percent agreement of the previous measurement, or when the turbidity measurements were reduced to below 10 nephelometric turbidity units (NTU).

The word “or” is used erroneously; please replace it with “and.”

**Response**—The word “or” has been replaced with “and” as suggested.

12. **Description of Ground-Water Monitoring and Sampling Program, Section 3.2.1, Page 3-3, 1st Paragraph**—During Event 9, 2 of 11 wells...had the water level drawn down to the top or below the top of the pump during pumping.

Over the years, the Department has commented that monitoring wells should not be drawn down to the top of the pump before sampling. This situation should not occur if a water level measuring instrument is being used during purging. All analytical results for such dewatered wells must be flagged in the report table with a footnote that the concentrations may be affected by oxygenation.

**Response**—Monitoring wells were sampled as part of Event 9 and sampling procedures have been changed in subsequent events. Wells are no longer purged dry. Prior to sampling, water levels are measured. If it is determined that a well has less than 2 ft of water in the PVC casing, the well is sampled with a peristaltic pump. Therefore, it is not considered necessary to flag report tables.

13. ***Volatile Organic Compounds, Section 3.2.2.1, Page 3-4, 2nd Paragraph***—In general, the highest concentrations of vinyl chloride were reported in samples from wells hydraulically downgradient of Building 201 (i.e., wells MW-NASB-072, MW-NASB-075, and MW-NASB-076), and from MW-NASB-080 which is located within the footprint of the ash landfill.

The Department has several issues with this statement. MW-NASB-076 is not downgradient of Building 201; it is crossgradient. Reference to Building 201 is inappropriate since it is not believed to be a source. The “ash landfill” is associated with an old dump that may have included a wider variety of wastes; therefore, a multiple descriptor needs to be used. The wording should be identical to that to be used in the Proposed Remedial Action Plan (PRAP). Lastly, the Department views the use of site features (such as Building 201 and ash landfill) in conjunction with vinyl chloride as misleading, in that it has not been shown that any feature within Site 9 is a source of vinyl chloride. To conclude, this sentence needs a complete overhaul.

***Response***—The Building and features noted in the sentence are landmarks and were not intended to be considered potential sources. The sentence has been revised as follows to remove reference to buildings and other site features:

*In general, the highest concentrations of vinyl chloride were reported in samples from wells hydraulically downgradient of Building 201 (i.e., wells MW-NASB-072, MW-NASB-075, and MW-NASB-076), and from MW-NASB-080 which is located within the footprint of the ash landfill.*

14. ***Volatile Organic Compounds, Section 3.2.2.1, Page 3-5, 1st Paragraph***—In general, decreasing or stable vinyl chloride concentrations were observed between Monitoring Event 8 (March 1997) and Monitoring Event 10 (November 1997) in samples collected from Site 9 monitoring wells.

The Department interprets Figure 3-7 graphs differently. Looking at only the last three monitoring events, vinyl chloride concentration trends are as follows: 2 decreasing, 2 steady (always non-detect), and 3 increasing. Based on this categorization, the above statement in question is inaccurate. The Navy must be rewrite this statement to eliminate bias relative to perceived natural attenuation.

***Response***—Comment noted. For the 1998 Annual Report, regression lines have been added to clarify site trends of vinyl chloride over time. For the Final 1997 Annual Report, the statement has been revised as follows:

*~~In general,~~ Decreasing or stable vinyl chloride concentrations were observed in 4 of 7 site wells (MW-NASB-071, MW-NASB-074, MW-NASB-075, and MW-NASB-076). The 3 remaining site wells (MW-NASB-069, MW-NASB-072, and MW-NASB-080) showed an increase in vinyl chloride concentrations.*

15. ***Inorganic Analytes, Section 3.2.2.2, Page 3-5, 1st Paragraph***—Therefore, the reported concentrations of these elements are considered to represent natural site conditions.

This assessment appears flawed in that 2 of the 10 NASB background wells are not documenting true background concentrations, in the opinion of the Department. These wells are MW-801, which greatly exceeds the aluminum MEG/MCL due to turbidity, and MW-NASB-020 which exceeds the manganese MEG/MCL due to a highly reductive subsurface environment. This situation has a strong bearing on the validity of the statement in question (see Comment No. 10). The Navy must rewrite this statement.

***Response***—The Navy recognizes that the MEDEP has expressed concerns about whether representative samples were collected from 3 wells (MW-801, MW-211B, and MW-NASB-020). The sentence in question has been revised as follows:

*Therefore, The Navy believes the reported concentrations of these elements are considered to represent natural site conditions based on background samples collected in 1994, and are unrelated to past activities at Site 9.*

16. ***Sediment Sample Results, Section 3.3.3.2, Page 3-8, 2nd Paragraph***—Under the discussion of SVOCs in sediment samples, the highest total SVOC value in the northern branch of the unnamed stream is not mentioned (179,370  $\mu\text{g}/\text{kg}$ , Event 10, sample location SED-010). MEDEP notes that this SVOC value is significantly higher than historical data values, and that total 1,2-dichloroethane and trichloroethene were also detected in 1997. Also, SW-010 was the only sampled location to detect vinyl chloride (0.8  $\mu\text{g}/\text{L}$ ) in surface water. Continued sampling is very important at this location. Please include this information in this section.

***Response***—The highest SVOC total (179,370  $\mu\text{g}/\text{kg}$ , Event 10, sample location SED-010) was inadvertently omitted. The second paragraph has been revised as follows:

*During 1997, the highest concentration of SVOC was reported in SED-011 (165,500 010 (179,370  $\mu\text{g}/\text{kg}$ ) in the Monitoring Event 10 duplicate sample.*

The Navy agrees that these SVOC data are significantly higher than historical data values, however, it should be noted that the original sample for SED-010 during Event 10 detected a concentration of 27,740  $\mu\text{g}/\text{kg}$ , which is consistent with historical data. The Navy stated that total 1,2-dichloroethane and trichloroethene were detected in 1997 in the first paragraph of Section 3.3.3.2. Surface water location SW-010 will continue to be sampled as part of this program.

17. ***Sediment Sample Results, Section 3.3.3.2, Page 3-8, 2nd Paragraph***—SVOC concentrations in sediment are likely attributable to the paved areas which drain to the unnamed streams, including parking lots, runways, and taxiways.

Statements such as this need to be deleted, unless they are backed up with appropriate data and analysis (or reference a BNAS report). The Department cannot endorse this explanation because benzo(a)pyrene and carbazole were found in both SED-010 and SED-011 samples; these are more typical of hazardous waste leachate than pavement runoff.

**Response**—The Navy continues to believe that PAH such as benzo(a)pyrene and carbazole, and other SVOC are the result of surface water runoff and are unrelated to past activities at Site 9. However, the subject statement has been removed from the report.

18. **Seep Sample Results, Section 3.3.2.3, Page 3-8, 2nd Paragraph**—The report needs to state that the concentrations for lead and manganese exceeded their MCLs for all three monitoring events in 1997. Give the highest value and date for both analytes.

**Response**—Seep sample concentrations have not been compared to ground-water MCL in the past. Therefore, the Navy does not feel this comparison is appropriate.

19. **Water Level Gauging Program, Section 4.1.1, Page 4-1, Bullets**—See previous Comment Nos. 2, 5, and 10.

**Response**—The first bullet has been modified as follows:

*Overburden ground water is likely to discharge to the northern branch of the unnamed streams and impoundment ponds located south of Neptune Drive. ~~as indicated by localized groundwater flow to the north, southwest, and south.~~*

The second bullet has been revised as follows:

*Overburden ground water from the ash landfill/dump area, and the approximate location of the old incinerator, is likely to discharge to the northern branch of the unnamed stream; overburden ground water in the vicinity of Building 201 appears to discharge to the northern ~~southern~~ branches of the unnamed streams and surface water impoundments.*

The third bullet has been revised as follows:

*Two surface water impoundments were constructed during 1997. These are likely to have affected water elevations adjacent to these bodies. ~~shallow ground-water flow patterns in the immediate vicinity of the ponds, although ground-water flow across Site 9 does not appear to have been affected.~~The long-term effects of this potential change to the ground-water flow pattern at Site 9 will be assessed in the future.*

The fourth bullet has been revised as follows:

*There were no significant variations in ground-water flow patterns at Site 9 noted during the three monitoring or bi-monthly gauging events.*

20. **Ground-Water Monitoring and Sampling Program, Site 9, Section 4.1.2.1, Page 4-2, 2nd Bullet**—See Comment No. 14.

**Response**—The first sentence of the second bullet of Section 4.1.2.1 has been deleted:

~~A general decrease in total VOC and vinyl chloride concentrations was observed between Monitoring Event 8 (March 1997) and Monitoring Event 10 (November 1997) in MW-NASB-075 and MW-NASB-076.~~

The second sentence of the second bullet of Section 4.1.2.1 on Page 4-2 has been revised as follows:

*Vinyl chloride detections in 4 of 7 other-site wells were consistent with previous long-term monitoring sample results showing decreasing or stable trends. The remaining 3 site wells (MW-NASB-069, MW-NASB-072, and MW-NASB-080) showed an increase in vinyl chloride concentrations.*

21. **Ground-Water Monitoring and Sampling Program, Site 9, Section 4.1.2.1, Page 4-2, Last Bullet**—Elevated manganese and thallium concentrations have also been reported in background samples, and are likely attributable to natural site conditions.

Table 2-1 (Summary of Analytical results for Ground-Water Samples Collected During Monitoring Event 9 at Background Monitoring Wells) does not include any results for thallium. Please provide the indicated background data (or reference) for this analyte.

**Response**—The following sentence has been added as the second to last sentence of the last bullet of Section 4.1.2.1:

*Thallium was not detected in ground-water samples collected at background wells during Monitoring Event 9 (November 1997). Thallium was detected at concentrations ranging from 1.4 µg/L to 2.1 µg/L in samples collected during 1994 as part of the background well sampling (ABB-ES 1994a).*

22. **Background Monitoring Wells, Section 4.1.2.2, Page 4-2, Bullet**—The primary reason for these exceedances is that two of these monitoring wells are not suitable for obtaining true background levels (see Comment Nos. 9 and 15).

**Response**—See response to Comment No. 9. The bullet in Section 4.1.2.2 has been revised as follows:

*Of the reported inorganics, there were no detections reported above corresponding State MEG.*

23. **Surface Water Sampling Program, Section 4.1.3, Page 4-3, Last Bullet**—The highest concentrations of VOC were reported during the March 1997 sampling event; VOC concentrations were consistently lower during the subsequent sampling events.

This statement is only true for sample location SW-012. The Department recommends rewriting as follows:

*The highest concentrations of VOC were reported for the March 1997 sampling event; except for trace level detections at SW-010, VOC concentrations at SW-011 and SW-012 tended to be lower during subsequent sampling events.*

**Response**—The sentence has been revised as recommended.

24. **Sediment Sampling Program, Section 4.1.4, Page 4-3, 2nd and 3rd Bullets**—The description of the locations of sediment sampling locations SED-010 and SED-012 have been switched from that indicated by Figure 2-1. Please correct.

**Response**—The description of the location of sediment locations SED-010 and SED-012 has been revised. Note that based on the response to Comment No. 16, SED-011 has been replaced with SED-010 in the last sentence of the third bullet.

25. **Seeps, Section 4.1.5.1, Page 4-3/4-4, Bullets**—None of these bullets addresses the large exceedances of MCLs for lead and manganese (see Comment No. 18).

**Response**—See the response to Comment No. 18. The Navy does not believe MCL are appropriate comparison for seep data.

26. **Sediment, Section 4.1.5.2, Page 4-4, 3rd Bullet**—Twenty inorganic analytes were reported in the sediment samples....

**Response**—“Inorganic analytes” has been replaced with “SVOC.”

27. **Conclusions, Section 4.3, Page 4-5, 1st Bullet**—The primary contaminant of concern at Site 9 (vinyl chloride) was reported in ground water from 5 wells during 1997, with the highest concentrations occurring in samples from 3 wells located downgradient of Building 201.

Please list the 3 wells, and check that all are downgradient of Building 201. Note that MW-NASB-069 is upgradient of the building.

**Response**—The sentence has been revised as follows:

*The primary contaminant of concern at Site 9 (vinyl chloride) was reported in ground-water samples collected from 5 wells during 1997, with the highest concentrations occurring in samples from 3 wells ~~located downgradient of Building 201~~ (MW-NASB-072, MW-NASB-069, and MW-NASB-080).*

28. **Conclusions, Section 4.3, Page 4-5, 2nd Bullet**—Sporadic vinyl chloride concentrations were reported in 3 site wells (MW-NASB-069, MW-NASB-072, and MW-NASB-080). These concentrations do not exhibit definitive trends, and are generally consistent with previous sampling events.

The Department clearly sees an increasing trend in vinyl chloride for all 3 wells between Monitoring Events 8 and 10. Please recheck the data tables in Appendix A. Even though Event 11 data are included (should be deleted) and indicate an end to this trend in two of three cases, the no-trend statement does not fit the report period.

MEDEP suggests that the following assessment be substituted:

*Vinyl chloride concentrations in 3 site wells (MW-NASB-069, MW-NASB-072, and MW-NASB-080) showed mild increasing trends during the report period resulting in exceedances of the MEG of 0.15 Fg/L and the MCL of 2 Fg/L. However, in all but one case, historic high concentrations were not exceeded.*

**Response**—The sentence has been revised as recommended. The Monitoring Event 11 data have been removed from the charts in Appendix A.

29. **Conclusions, Section 4.3, Page 4-5, Bullets**—The high lead concentration (379  $\mu\text{g/L}$ ) of Monitoring Event 10 in water of LT-901 seep needs be included. This occurrence seems to have been overlooked throughout the text.

**Response**—The following text has been added as a bullet to Section 4.2:

*Lead was reported in Seep LT-901 at a concentration of 379 Fg/L during Monitoring Event 10. This result is elevated compared with other sampling events in 1997.*

It should be noted that the second paragraph of Section 3.3.2.3, Seep Sample Results, Page 3-8, does indicate that the highest concentrations were noted during the November sampling event (Monitoring Event 10), as compared to prior sampling events.

30. **Conclusions, Section 4.3, Page 4-5, Next to Last Bullet**—The reported concentrations of inorganics and 1 SVOC in stream bed sediment are likely attributable to stormwater/surface water runoff from the runways and paved areas north of Site 9.

Table 3-7 shows a lot more than one SVOC in streambed sediment at all three locations. Please correct this number.

Also, see Comment No. 17 regarding a more probable source of some SVOCs, and adjust the bullet text accordingly.

**Response**—The Navy continues to believe the SVOC reported in stream sediment at Site 9 are from the large portion of paved areas which drain into the stream. The sentence has been revised as follows:

*The reported concentrations of inorganics and 1 SVOC in stream bed sediment are likely attributable to stormwater/surface water runoff from the runways and paved areas north of Site 9. There is no indication that these analytes are attributable to the ash landfill at Site 9, though this was not confirmed in 1997.*

31. **Conclusions, Section 4.3, Page 4-6, Top Bullet**—Upon studying this report, the Department especially does not agree with removing surface water sediment location SED-010, and has some reservations with deleting SED-011 even though it is inundated by the lower pond.

**Response**—Inclusion of these sediment sample locations will be discussed as part of the LTMP revision which is currently under preparation.

32. **Conclusions, Section 4.3, Page 4-6, 3rd Bullet**—Data presented in Table 3-7 and Figure 3-8 plots indicate that SVOCs are important to monitor in order to better assess natural attenuation. Likewise, inorganics may be very useful for the same purpose. MEDEP needs to discuss this proposed change with the Navy.

**Response**—The Navy does not agree that concentrations of metals and SVOC detected in sediment will be able to be conclusively related to the natural attenuation of vinyl chloride in ground water. Therefore, the Navy feels that the cost of continuing to sample for inorganics and SVOC does not provide direct evidence that natural attenuation would be occurring in Site 9 ground water. The Navy would prefer to assess the natural attenuation process using VOC data, in addition to water quality indicator parameter data. Samples at Site 9 will be collected according to the LTMP revision that is currently being finalized.

33. **Table 3-4**—Why is thallium missing for 3 of the 5 wells for which TAL analyses were performed (MW-NASB071, MW-NASB-072, and MW-NASB-081)?

**Response**—Thallium is not listed on Table 3-4 for wells MW-NASB071, MW-NASB-072, and MW-NASB-081 because it was not detected. As per previous reports, only those analytes detected in at least one of the samples, and the contaminants of concern listed in the Long-Term Monitoring Plan (ABB-ES 1995), are shown on summary tables.