



**Final  
Site 17 (Building 95)  
Monitoring Event 24 Report  
September 2006**

Contract No. N62472-02-D-0810  
Contract Task Order No. 007

**Naval Air Station  
Brunswick, Maine**

Prepared by:



**ECC  
33 Boston Post Road West, Suite 340  
Marlborough, MA 01752**

Prepared for:  
Department of the Navy  
Naval Facilities Engineering Command  
BRAC Program Management Office - Northeast  
4911 South Broad Street  
Philadelphia, Pennsylvania 19112-1303

**February 2008**



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**SITE 17**  
**MONITORING EVENT 24 SUMMARY REPORT**  
**SEPTEMBER 2006**

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*29 Feb 2008*

Date

## QUALITY REVIEW STATEMENT

Contract No. N62472-02-D-0810  
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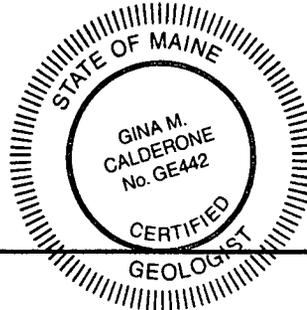
Final Monitoring Event 24 Report – September 2006 for Site 17 (Building 95), Naval Air Station, Brunswick, Maine

ECC CTO Senior Project Manager: Alexander C. Easterday, P.G.

As per State of Maine Department of Professional and Financial Regulations, Title 32 Chapter 73, Law, the sections of this document related to geology and geologic data interpretation have been reviewed for its technical content by the undersigned State of Maine Certified Geologist.

This document has been reviewed by the undersigned for their geological interpretive content. This statement is based upon the review of the undersigned conducted during the preparation of this report, as dated below.

State of Maine Geologist Reviewer:



29 FEB 2008

Date

Gina M. Calderone, P.G., C.P.G.  
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ECC Project Manager/Hydrogeologist

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## LIST OF ABBREVIATIONS AND ACRONYMS

<b>4,4'-DDT</b>	dichlorodiphenyltrichloroethane
<b>4,4'-DDD</b>	dichlorodiphenyldichloroethane
<b>AMSL</b>	above Mean Sea Level
<b>°C</b>	degrees Celsius
<b>EPA</b>	U.S. Environmental Protection Agency
<b>J</b>	estimated value
<b>LTMP</b>	Long-Term Monitoring Plan
<b>MCL</b>	Federal Maximum Contaminant Level
<b>MEDEP</b>	Maine Department of Environmental Protection
<b>MEG</b>	maximum exposure guideline
<b>µg/L</b>	micrograms per liter
<b>µmhos/cm</b>	micromhos per centimeter
<b>mg/L</b>	milligrams per liter
<b>mV</b>	millivolt
<b>NAS</b>	Naval Air Station
<b>NTU</b>	nephelometric turbidity units
<b>ORP</b>	oxidation reduction potential
<b>PRG</b>	Region IX Preliminary Remediation Goal
<b>PVC</b>	polyvinyl chloride
<b>TCL</b>	target compound list

## **1.0 PROJECT ACTIVITIES AND MONITORING EVENT RESULTS**

Under Contract Number N62472-02-D-0810, Contract Task Order No. 007, Engineering Field Activity Northeast, Naval Facilities Engineering Command contracted with ECC to perform long-term monitoring at Site 17, Naval Air Station (NAS), Brunswick, Maine (Figure 1-1).

At the Site 17 site (Figure 1-2), the Navy is currently performing long-term monitoring in accordance with the November 2004 Long-Term Monitoring Plan (LTMP) (EA Engineering, Science and Technology [EA] 2000) and the Proposal for Optimizing Groundwater Samples Collected as Part of Long-Term Monitoring, Naval Air Station, Brunswick, Maine.(EA 2004). The Site 17 long-term monitoring plan well designation and sample parameters are summarized in Table 1-1.

This report provides a summary of the monitoring and sampling completed during Monitoring Event 24 (September 2006). The appendices provide supporting information. Appendix A is a history of the site, Appendix B is field data, Appendix C is the analytical data quality review, Appendix D provides the Form I data sheets, Appendix E provides the engineering inspection report, Appendix F provides trend graphs, and Appendix G will contain comments from the regulators (when the final version of this report is submitted).

### **1.1 Site History**

Appendix A provides a historical summary of the site.

### **1.2 Measurement of Water Level Elevations**

Water level measurements were obtained on September 8, 2006 at six groundwater monitoring wells (MW-NASB-065, MW-NASB-066, MW-NASB-067, MW-NASB-068, MW-NASB-097, and MW-NASB-098) located at the Site 17 site. Water level gauging data and historical water level trends are summarized in Table 1-2, and the field monitoring well gauging summary is included in Appendix B. The gauging measurements were used to interpret the groundwater potentiometric surface for the Site 17 site (Figure 1-3).

### **1.3 Groundwater Monitoring, Sampling, and Analysis**

The Site 17 sampling program was performed from 11 to 14 September 2006. Groundwater samples were collected from well MW-NASB-067 using a dedicated submersible pumping system and from wells MW-NASB-097 and MW-NASB-098 using a non-dedicated submersible pump. The non-dedicated pump was thoroughly decontaminated between wells. The low-flow sampling technique presented in the LTMP (EA 2004) and in the optimized groundwater sampling proposal (EA 2004) was followed. Water quality indicator parameters including pH, specific conductance, temperature, dissolved oxygen, oxidation-reduction potential, and turbidity were monitored and recorded during well purging to ensure that these parameters were stable before samples were collected (Table 3-1).

The Low Flow/Low Stress Groundwater Sampling Forms for the September 2006 sampling event can be found in Appendix A.

Groundwater samples were submitted to Accutest Laboratory in Marlborough, Massachusetts for analysis of LTMP Target Compound List (TCL) pesticides and other reportable pesticides by Environmental Protection Agency (EPA) Method 8081A. Accutest Laboratory is a Navy certified laboratory. The sample cooler was delivered to the laboratory by a sample courier.

All results reported as non-detect were evaluated against the method detection limit (MDL), which is the lowest limit of quantitative detection for a compound. By convention, non-detects is reported using the higher method reporting limit (MRL) with the non-detect qualifier (U). For the following compounds, the MRL is higher than the project action limits but the MDL is less than the project action limits:

- Aldrin (Maine Maximum Exposure Guideline [MEG] is 0.02 µg/L, MDL is 0.0072 µg/L, and MRL is 0.0210 µg/L); and
- Dieldrin (MEG is 0.02 µg/L, MDL is 0.0069 µg/L, and MRL is 0.0210 µg/L).

#### **1.4 Quality Assurance and Quality Control**

The data obtained during the September 2006 sampling event were determined to be of sufficient quality to be used to evaluate groundwater quality at the Site 17 (all pesticide data are usable, as qualified). One field duplicate sample was collected from well MW-NASB-097 (BN-95-24-MWXD1) and analyzed as a field quality control sample. Table 1-4 provides a summary of analytical results for groundwater samples collected at the Site 17 in September 2006. The data quality evaluation is included as Appendix C (Analytical Data Quality Review) and Appendix D (Analytical Report Form I Data Sheets).

#### **1.5 Visual Inspection**

Site inspection activities were completed in accordance with the Final LTMP (EA 2004) on 22 September 2006 (Appendix E). Inspection of the area confirmed no exposures of the geotextile marker fabric at the ground surface. The six on-site monitoring wells were found to be intact. Groundwater monitoring wells MW-NASB-065, MW-NASB-066, MW-NASB-067, MW-NASB-068, and MW-NASB-098 were adequately labeled, capped, and locked. Well MW-NASB-097 was capped but not labeled, and the flush-mounted roadbox had a broken rim and could not be locked. Well MW-NASB-097 suffered damage by snowplow activities during the previous winter, and temporary repairs were installed until permanent repairs can be affected. There was no indication of vandalism of any of the six on-site wells. In June and September 2006, all vegetation appeared healthy and very well watered. Some browning vegetation was observed during the September 2005 sampling event.

## 2.0 OBSERVATIONS AND TRENDS

The following sections present field and analytical results and data trends observed during Monitoring Event 24 conducted in September 2006.

### 2.1 Groundwater Levels

The results of the groundwater level gauging program (Table 1-2 and Appendix B) indicate that the groundwater flow direction in the immediate area of the Site 17 site is generally towards the southeast (Figure 1-3). The hydraulic gradient between wells MW-NASB-066 and MW-NASB-098 was approximately 0.0067 in September 2006 (as compared to 0.0065 in June 2006 and 0.0028 for September 2005). In general, the hydraulic gradient across the Site 17 site is relatively flat. The groundwater levels at the Site 17 site demonstrate a definite seasonal component with higher levels occurring during the spring monitoring events and lower levels occurring during the fall monitoring events (refer to the historical groundwater level graph accompanying Table 1-2). The average water level fluctuation between spring and fall monitoring events is 2.5 feet. Water levels measured in September 2006 were approximately 0.2 feet higher than the fall average for each well.

### 2.2 Field Water Quality Parameters

Water quality parameters, including pH, specific conductance, oxidation-reduction potential (ORP), temperature, dissolved oxygen, and turbidity, were measured during well purging and were recorded on the field sampling forms (Appendix B). Per the LTMP, the ECC Field Team Leader reviewed the pre- and post-field equipment calibration records and the field data forms for accuracy. Table 3-1 presents the results of field water quality measurements and includes historical trend graphs for all measured parameters. The following observations about the September 2006 data are noted:

- **MW-NASB-067:** pH, specific conductance, dissolved oxygen, turbidity were below average. Temperature and ORP were above average.
- **MW-NASB-097:** pH, specific conductance, dissolved oxygen and ORP were below average. Temperature and turbidity were at, or above average.
- **MW-NASB-098:** Dissolved oxygen and ORP were below average. pH, temperature, specific conductance, and turbidity were at, or above average.

### 2.3 Analytical Results

Pesticides results for all sampled Site 17 monitoring wells from Monitoring Event 21 (April 2005) through Monitoring Event 24 (September 2006) were non-detect except for detections of 4,4'-DDD and 4,4'-DDT at MW-NASB-067. Appendix F provides trend graphs of analytical results through Monitoring Event 24. The following historical detections of pesticides are noted for historical reference:

- **Monitoring Well MW-NASB-067** – Dichlorodiphenyltrichloroethane (4,4'-DDT) was detected during Monitoring Events 17 through 20; however, at concentrations below the MEG (1.0 µg/L).
- **Monitoring Well MW-NASB-097** – Heptachlor epoxide and alpha-chlordane exceeded the Maine MEGs (0.04 micrograms per liter [µg/L] and 0.27 µg/L, respectively) from 2000 through 2003 during all sampling events. Since the April 2004 sampling event, heptachlor epoxide no longer exceeded the State MEG and was not detected during Monitoring Events 21 through 24. In addition, alpha-chlordane, which reached a maximum observed concentration of 0.72 µg/L in October 2001, has shown a steadily decreasing trend below the State MEG and was not detected during the last three monitoring events.

Other pesticide compounds have not been detected, or were detected at levels below corresponding MEGs and MCLs, since well MW-NASB-097 was installed and first sampled in March 2000. Dichlorodiphenyldichloroethane (4,4'-DDD) was detected from Monitoring Event 16 through Monitoring Event 20. This compound has no MEG or MCL, but it does have a Region IX Preliminary Remediation Goal (PRG) of 0.28 µg/L. Exceedances of the PRG occurred during Monitoring Event 16 (0.162 µg/L) and Monitoring Event 19 (0.11 J µg/L).

- **Monitoring Well MW-NASB-098** – Pesticide compounds were not detected in this well during Monitoring Events 1 through 18 or 20 through 24. During Monitoring Event 19 in April 2004, 4,4'-DDT was detected at an estimated concentration of 0.0090 J µg/L.

### 3.0 LONG-TERM MONITORING OBJECTIVES AND RECOMMENDATIONS

The following lists the objectives specified in the Site 17 LTMP, and provides conclusions as to whether the long-term monitoring event was successful in achieving these objectives or whether changes to the monitoring program are recommended.

#### 3.1 Long-Term Monitoring Objectives

- **LTMP Objective** – *Monitor and assess trends in the groundwater quality with emphasis on contaminants of concern to verify that the soil and debris removal action was effective.*

The concentrations of pesticides reported in each of the 3 wells sampled for Monitoring Event 24 (i.e., MW-NASB-067, MW-NASB-097 and MW-NAASB-098) were all non-detect for pesticides. In the past four monitoring events (i.e., 2 years), pesticides have not exceeded any Federal MCL or State MEGs. Heptachlor epoxide and alpha-chlordane have exceeded the State MEGs in the past at one site well (MW-NASB-097). Heptachlor epoxide fell below the State MEG (0.04 µg/L) during Monitoring Event 19 and alpha-chlordane has been below the State MEG (0.27 µg/L) since Monitoring Event 17. Since these events, heptachlor epoxide and alpha-chlordane, have noted a relatively stable decreasing concentration trend.

At monitoring well MW-NASB-067, the compound 4,4'-DDT was detected at levels well below the MEG (1.0 µg/L) from Monitoring Event 17 through Monitoring Event 19 and exhibited an increasing concentration trend during this time. 4,4'-DDT was reported as non-detect for Monitoring Events 21 through 23 and was again detected during Monitoring Event 24 at levels well below the MEG.

- **LTMP Objective**—*Assess the potential for adverse environmental impacts by monitoring for evidence of stressed vegetation.*

During the June and September 2006 monitoring events, all vegetation appeared to be healthy and very well watered; however, browning in the tips of about 10% of the pine trees was observed at the Site 17 during Monitoring Event 22 (September 2005). The condition of vegetation in the area will continue to be monitored.

- **LTMP Objective**—*Monitor and maintain the structural integrity of the groundwater monitoring wells.*

The integrity of the groundwater monitoring wells was evaluated during this monitoring event. No issues concerning integrity of the monitoring wells were identified.

### **3.2 Recommendations**

Based on an analysis of the data collected at the Site 17 and review of the data in the last 4 monitoring events, the following recommendation is provided:

- Discontinue the long-term monitoring of the existing 3 monitoring wells at Site 17. The Navy is planning to conduct a remedial investigation at Site 17 to investigate the soil north and south of Avenue B during the 2007 field season (ECC 2007; TtNUS 2007). Once the remedial investigation has been completed, the results will be used to re-evaluate the need for continued groundwater sampling, or whether to conduct further remedial actions at the Site. As part of the Remedial Investigations at Site 9, the groundwater monitoring network will be re-evaluated and it is recommended that the monitoring of the 3 remaining monitoring wells at the site is either temporarily discontinued or reduced to annual sampling throughout the remedial investigation activities until the site conditions are re-evaluated. The Navy is planning to issue the Draft Remedial Investigation Work Plan for Site 17 in June 2007 (TtNUS 2007).

#### 4.0 REFERENCES

- ABB Environmental Services (ABB-ES). 1993. *Action Memorandum, Building 95*. April.
- ABB-ES. 1994. *Final Long-Term Monitoring Plan Building 95, Sites 1 and 3 and Eastern Plume*. August.
- EA Engineering, Science, and Technology (EA). 1997. *Final Monitoring Event 9 – August 1997, Building 95, Naval Air Station, Brunswick, Maine*. November.
- EA. 2004. *Final Long-Term Monitoring Plan, Building 95, Naval Air Station, Brunswick, Maine*. November.
- EA. 2002. *Technical Memorandum for Reduction in Long-Term Monitoring Sample Analysis at Building 95, Naval Air Station Brunswick, Maine*. April.
- EA. 2004. *Proposal for Optimizing Groundwater Samples Collected as Part of Long-Term Monitoring, Naval Air Station, Brunswick, Maine*. October .
- Maine Department of Environmental Protection (MEDEP). 2001. *Confirmation Letter regarding Building 95 – Avitrol, Naval Air Station, Brunswick to Mr. Orlando J. Monaco, Department of the Navy, Engineering Field Activity Northeast*. 19 July.
- MEDEP. 2002. *Correspondence from Claudia Sait to the Department of the Navy concerning reduction in long-term monitoring sample analysis*. 16 September.
- Tetra Tech NUS (TtNUS). 2007. *Draft Remedial Investigation Work Plan for Site 17*. June.
- U.S. Environmental Protection Agency. 2002. *Correspondence from Michael Barry to Department of the Navy concerning Building 95 Long-Term Monitoring Plan*. 13 September.

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## **TABLES**

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**Table 1-1**  
**Summary of the Long-Term Monitoring Program**  
**Site 17, Naval Air Station, Brunswick, Maine**

Well Designation	Sample Parameters			
	Sampling Frequency <sup>(a)</sup>	Target Compound List Pesticides <sup>(b)</sup>	Bi-Annual Gauging	Field Parameters <sup>(c)</sup>
MW-NASB-065	Semi-annual	NR	X	NR
MW-NASB-066	Semi-Annual	NR	X	NR
MW-NASB-067	Semi-Annual	X	X	X
MW-NASB-068	Semi-Annual	NR	X	NR
MW-NASB-097	Semi-Annual	X	X	X
MW-NASB-098	Semi-Annual	X	X	X
MW-NASB-210 <sup>(d)</sup>	Semi-Annual	NR	X	NR
MW-NASB-209R <sup>(d)</sup>	Semi-Annual	NR	X	NR

NOTES:

(a) Semi-annual samples are collected in April and September of each year.

(b) Pesticide Target Compound List (TCL) for SW-846 8081A: Lindane and 4,4'-DDT (LTMP 2004); however, other non-TCL SW-846 Method 8081A pesticides are reported

(c) Determination of field parameters in accordance with U.S. Environmental Protection Agency/600/4-79/020 using the following methods: pH (Method 150.1), temperature (Method 170.1), specific conductance (Method 120.1), and turbidity (180.1); optional field parameters, including dissolved oxygen (Method 360.1) and oxidation-reduction potential (ORP), as ORP<sub>Ag/AgCl</sub>, are also recorded.

(d) MW-NASB-210 and MW-NASB-209R are located at the Old Navy Fuel Farm. These wells are not part of the Site 17 Long-Term Monitoring Program but are gauged to provide additional data on local groundwater flow patterns. **These wells were not gauged during this monitoring event.**

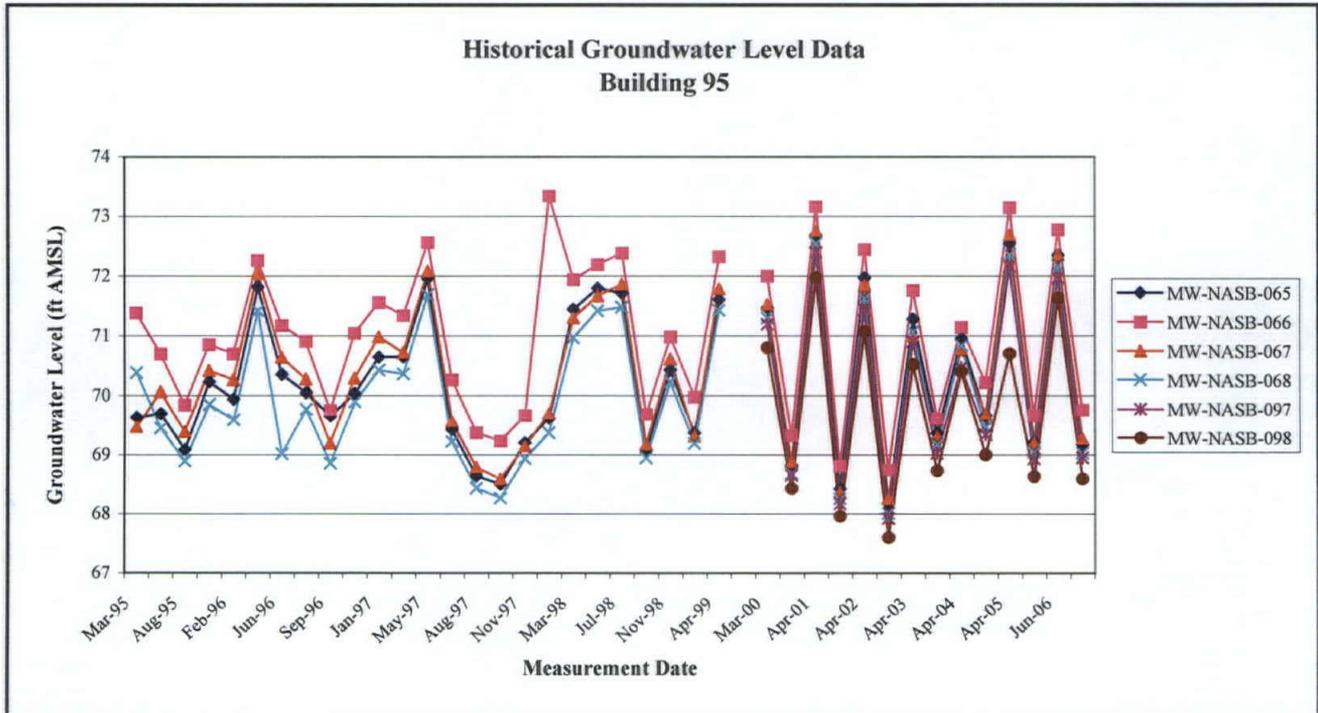
NR = Not required

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**Table 1-2**  
**Monitoring Well Gauging Summary - September 2006 and**  
**Historical Groundwater Level Trends**  
**Site 17 (Building 95) - Naval Air Station, Brunswick, Maine**

Well Designation	Well Riser Elevation (feet AMSL)	Depth to Well Bottom (feet below top of PVC)	Monitoring Event 24 Gauging Data (September 8, 2006)		Average Water Level for Fall Monitoring Events
			Depth to Water (feet below top of PVC riser)	Water Table Elevation (feet above AMSL)	
MW-NASB-065	74.29	15.5	5.12	69.17	69.07
MW-NASB-066	78.79	19.79	9.03	69.76	69.52
MW-NASB-067	74.3	15	5.03	69.27	69.03
MW-NASB-068	74.86	15.05	5.84	69.02	68.78
MW-NASB-097	73.41	11.05	4.46	68.95	68.71
MW-NASB-098	76.53	16	7.94	68.59	68.42

NOTE:  
 AMSL = Above Mean sea level  
 PVC = Polyvinyl chloride



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**Table 1-3**  
**Summary of Water Quality Indicator Parameters - September 2006 and**  
**Historical Water Quality Parameter Trends**  
**Building 95, Naval Air Station, Brunswick, Maine**

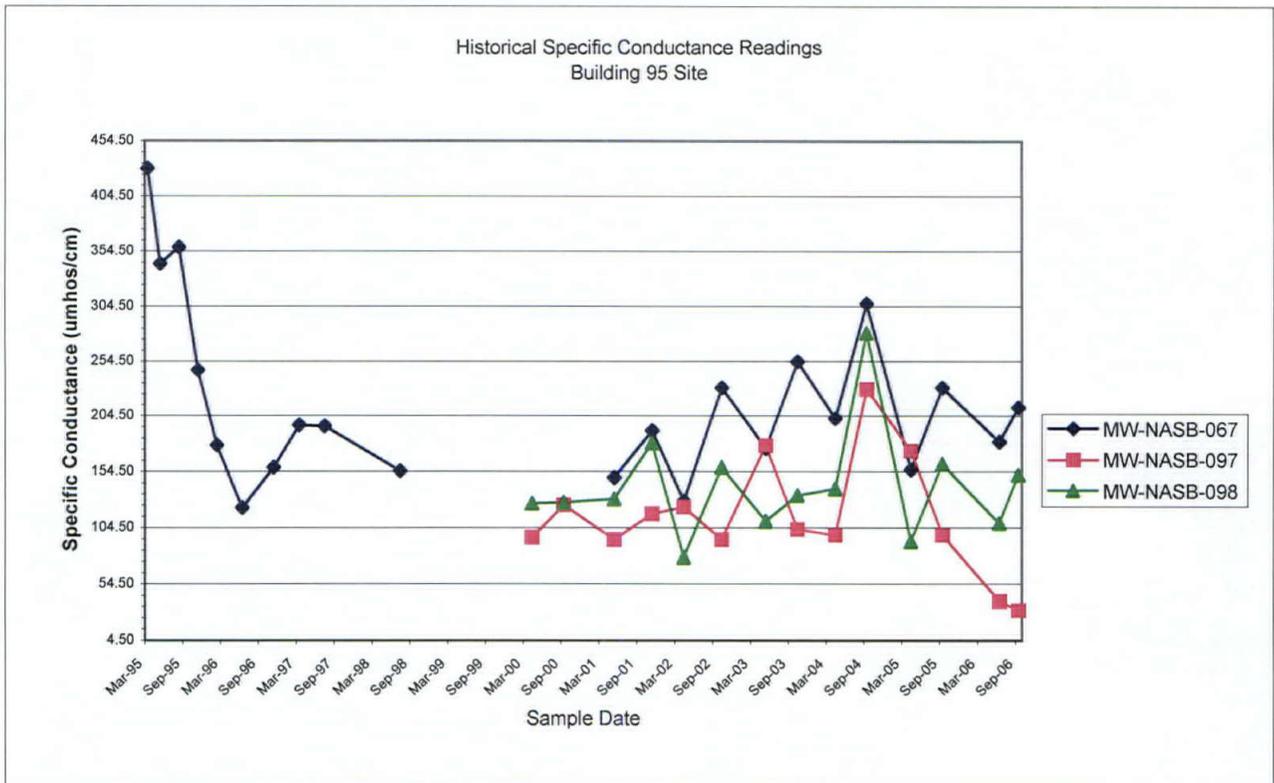
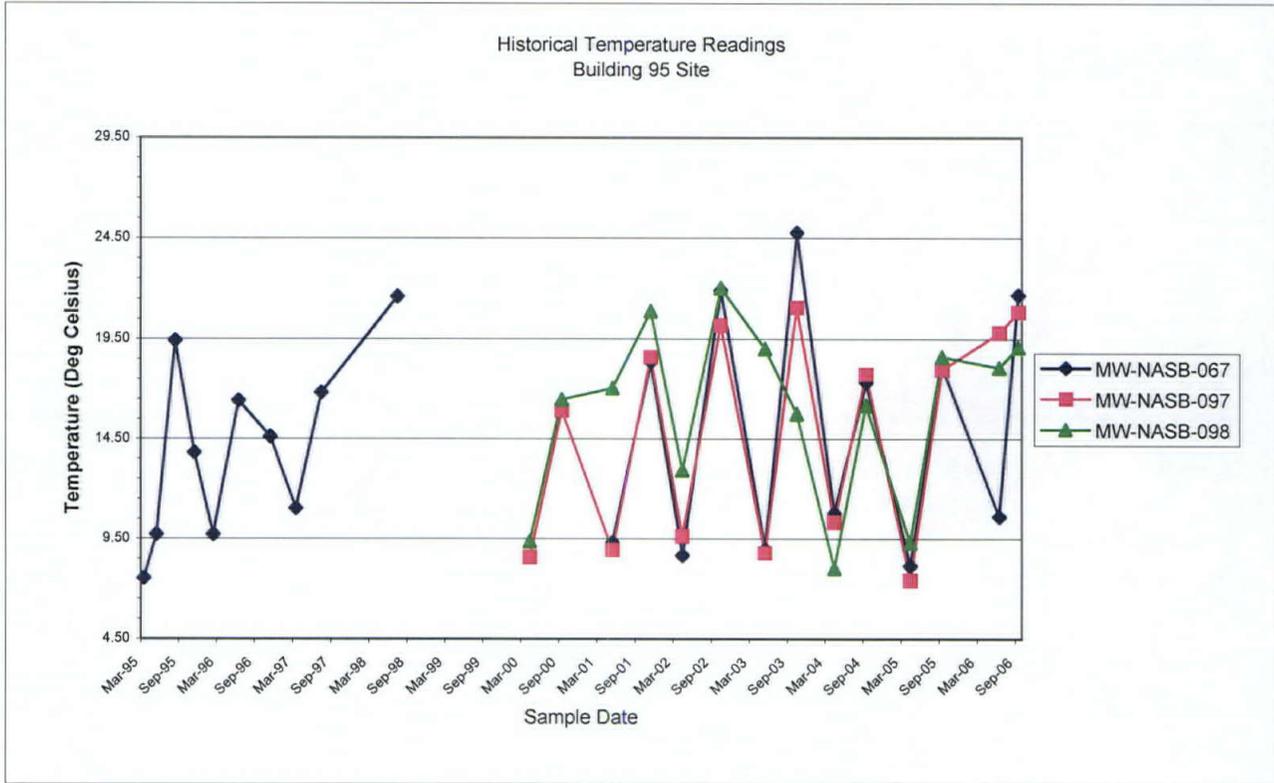
Well Designation	Sample Date	pH (S.U.)	Temperature (°C)	Specific Conductance (µmhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	ORP <sub>Ag-AgCl</sub> (mV)
MW-NASB-067	9/11/2006	5.25	21.66	212	0.33	5	335
	Historical Average	5.77	14.50	218.00	0.83	14.01	73.13
MW-NASB-097	9/13/2006	5.38	20.82	31	0.52	9.2	122.1
	Historical Average	5.67	14.68	114.14	2.58	9.16	175.86
MW-NASB-098	9/14/2006	6	19.05	151	0.22	8	-9
	Historical Average	5.77	15.89	140.93	1.66	8.54	88.19

**NOTES:**

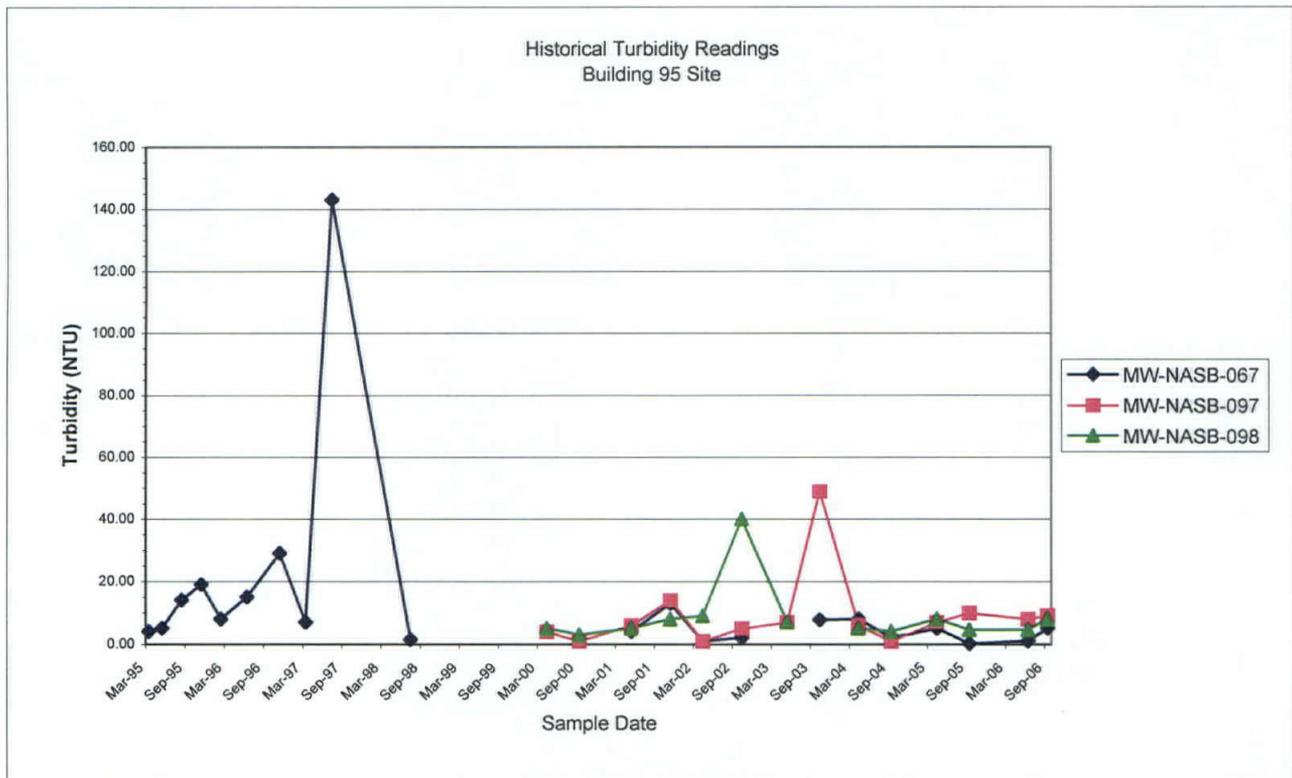
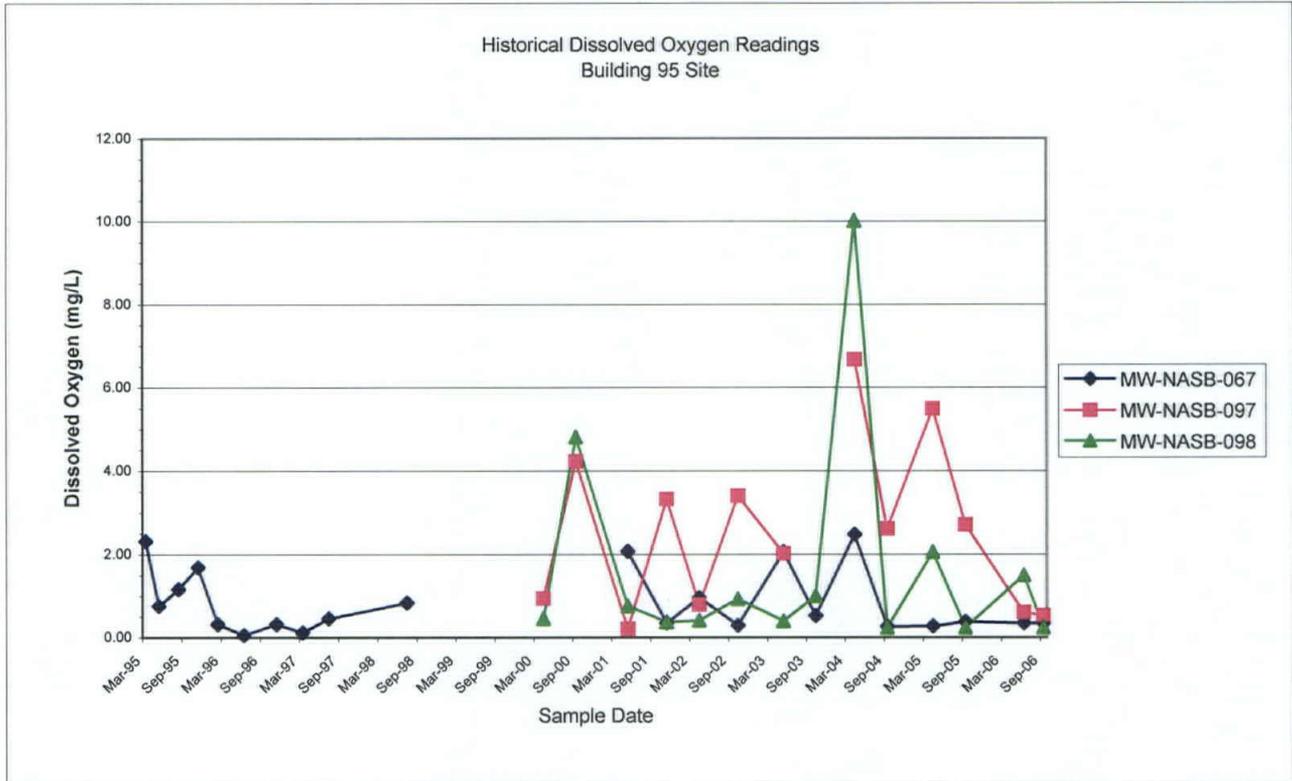
NTU = nephelometric turbidity unit  
 ORP<sub>Ag-AgCl</sub> = Oxidation/Reduction Potential  
 °C = degrees Celsius  
 µmhos/cm = microohms per centimeter  
 mV = millivolt  
 mg/L = milligram per liter  
 S.U. = Standard Units



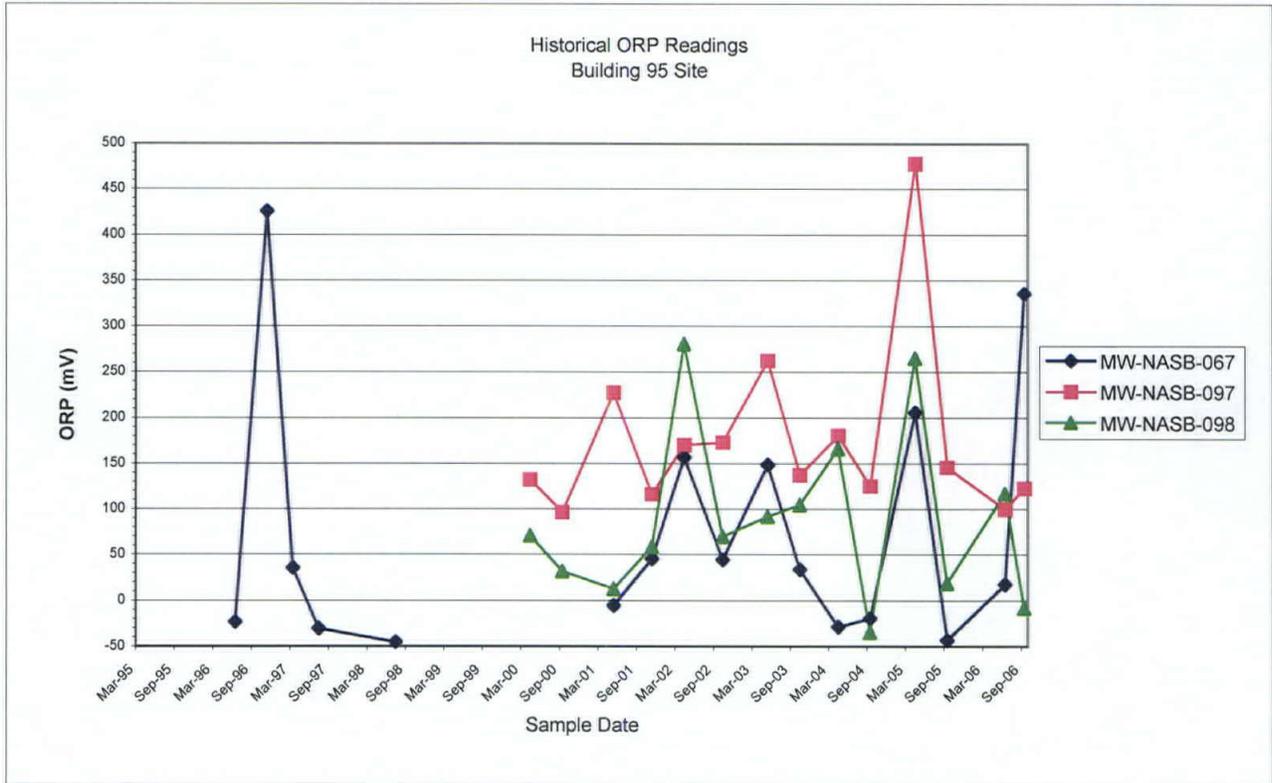
**Table 1-3**  
**Summary of Water Quality Indicator Parameters - September 2006 and**  
**Historical Water Quality Parameter Trends**  
**Building 95, Naval Air Station, Brunswick, Maine**



**Table 1-3**  
**Summary of Water Quality Indicator Parameters - September 2006 and**  
**Historical Water Quality Parameter Trends**  
**Building 95, Naval Air Station, Brunswick, Maine**



**Table 1-3**  
**Summary of Water Quality Indicator Parameters - September 2006 and**  
**Historical Water Quality Parameter Trends**  
**Building 95, Naval Air Station, Brunswick, Maine**



**Table 1-4**  
**Summary of Groundwater Results - Site 17 (Building 95)**  
**September 2006 (Monitoring Event 24)**  
**Naval Air Station, Brunswick, Maine**

Site Name: Building 95

Station ID:	MW-NASB-067	MW-NASB-097	MW-NASB-098	MW-NASB-098
Field Sample ID*:	MW067	MW097	MW-XD1	MW098
Lab Sample ID:	M59202-1	M59202-2	M59202-4	M59202-3
Sample Date:	9/11/2006	9/13/2006	9/13/2006	9/14/2006
Lab Name:	Accutest	Accutest	Accutest	Accutest
Field QC:	Original data	Original data	Field duplicates	Original data
Sampling Method:	Low-Flow	Low-Flow	Low-Flow	Low-Flow

Units	Federal MCL	Maine MEG						
<b>Pesticides</b>								
4,4'-DDD	ug/l	NA	NA	0.071 J / 0.0099	0.02 UJ / 0.01	0.0210 UJ / 0.0099	0.0210 UJ / 0.0099	-
4,4'-DDE	ug/l	NA	NA	0.02 U / 0.01	0.021 U / 0.011	0.02 U / 0.01	0.02 U / 0.01	-
4,4'-DDT	ug/l	NA	1	0.016 J / 0.0076	0.0210 UJ / 0.0078	0.0210 UJ / 0.0076	0.0210 UJ / 0.0076	-
Aldrin	ug/l	NA	0.02	0.0210 UJ / 0.0072	0.0210 UJ / 0.0073	0.0210 UJ / 0.0072	0.0210 UJ / 0.0072	-
Alpha-BHC	ug/l	NA	NA	0.0210 UJ / 0.0064	0.0210 UJ / 0.0065	0.0210 UJ / 0.0064	0.0210 UJ / 0.0064	-
Alpha-chlordane	ug/l	NA	0.3	0.0210 U / 0.0058	0.0210 U / 0.0059	0.0210 U / 0.0058	0.0210 U / 0.0058	-
Beta-BHC	ug/l	NA	NA	0.0210 U / 0.0092	0.0210 U / 0.0094	0.0210 U / 0.0092	0.0210 U / 0.0092	-
Delta-BHC	ug/l	NA	NA	0.021 UJ / 0.013	-			
Dieldrin	ug/l	NA	0.02	0.0210 UJ / 0.0069	0.021 UJ / 0.007	0.0210 UJ / 0.0069	0.0210 UJ / 0.0069	-
Endosulfan I	ug/l	NA	42	0.0210 U / 0.0092	0.0210 U / 0.0094	0.0210 U / 0.0092	0.0210 U / 0.0092	-
Endosulfan II	ug/l	NA	42	0.0210 U / 0.0084	0.0210 U / 0.0085	0.0210 U / 0.0084	0.0210 U / 0.0084	-
Endosulfan Sulfate	ug/l	NA	42	0.0210 U / 0.0096	0.0210 U / 0.0098	0.0210 U / 0.0096	0.0210 U / 0.0096	-
Endrin	ug/l	2	2	0.021 U / 0.014	-			
Endrin Aldehyde	ug/l	NA	NA	0.0210 UJ / 0.0086	0.0210 UJ / 0.0088	0.0210 UJ / 0.0086	0.0210 UJ / 0.0086	-
Endrin Ketone	ug/l	NA	NA	0.0210 U / 0.0097	0.0210 U / 0.0099	0.0210 U / 0.0097	0.0210 U / 0.0097	-
Gamma-BHC (Lindane)	ug/l	NA	0.2	0.02 UJ / 0.01	-			
Gamma-Chlordane	ug/l	NA	0.3	0.0210 U / 0.0058	0.0210 U / 0.0059	0.0210 U / 0.0058	0.0210 U / 0.0058	-
Heptachlor	ug/l	0.4	0.08	0.0210 UJ / 0.0093	0.0210 UJ / 0.0095	0.0210 UJ / 0.0093	0.0210 UJ / 0.0093	-
Heptachlor Epoxide	ug/l	0.2	0.04	0.0210 U / 0.0092	0.0210 U / 0.0094	0.0210 U / 0.0092	0.0210 U / 0.0092	-
Methoxychlor	ug/l	40	35	0.0210 UJ / 0.0076	0.0210 UJ / 0.0078	0.0210 UJ / 0.0076	0.0210 UJ / 0.0076	-

## Table 1-4

### Notes

MEG (Maximum Exposure Guideline) - obtained from State of Maine Department of Human Services Maximum Exposure Guidelines, Memorandum dated 23 October 1992.

MCL (Maximum Contaminant Level) - obtained from 40 CFR Parts 141 and 142 (U.S. EPA 1998).

0.02 U / 0.01      Result (Non-Detects reported to the Method Reporting Limit) / Method Detection Limit

NA      Criteria not applicable

ug/L      micrograms per liter

-      Not sampled

U      Non detect down to the method detection limit (MDL). MDLs are provided in Appendix C (Analytical Data Quality Review).

J      Estimated concentration

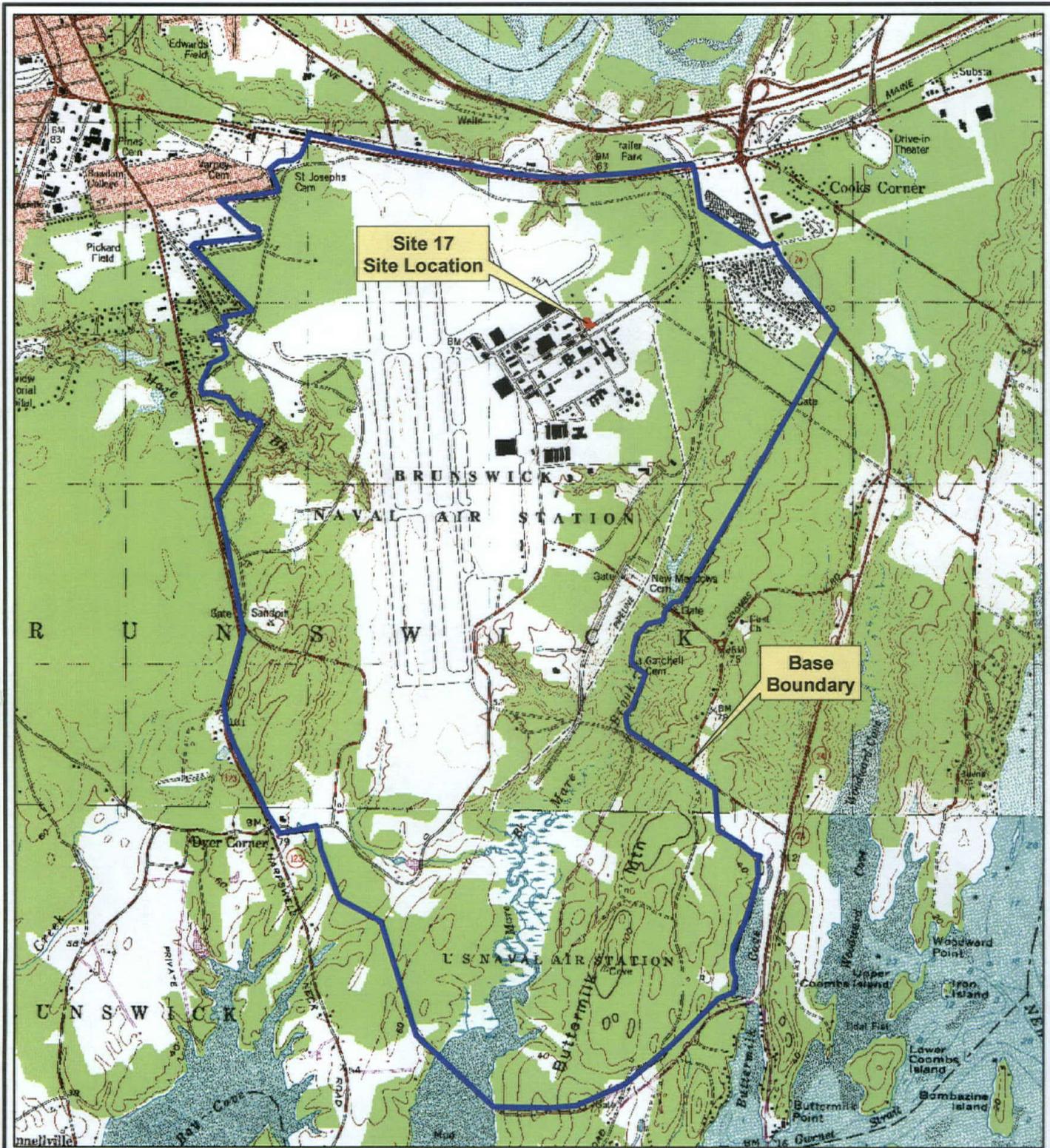
UJ      Not detected. Sample quantitation limit is estimated.

R      Value rejected by data validator

Highlighted concentrations indicate exceedance of an MEG or MCL. The color of the highlight indicated which screening level was exceeded. Refer to the Data Quality Review section for reporting limits and method detection limits for all analyzed compounds.

## **FIGURES**

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Contract No.	N62472-02-D-0810		
Description	Site 17 Site Location		
Coordinate system	NAD 1983, UTM, Zone 19 N in meter		
Sources	Naval Base Boundary provided by Navy, Orrs Island (1978) and Brunswick (1980) 7.5 minute quadrangles provided by USGS.		



Legend	
	NASB Brunswick Boundary
	Site 17 Site Location

**Figure 1-1**

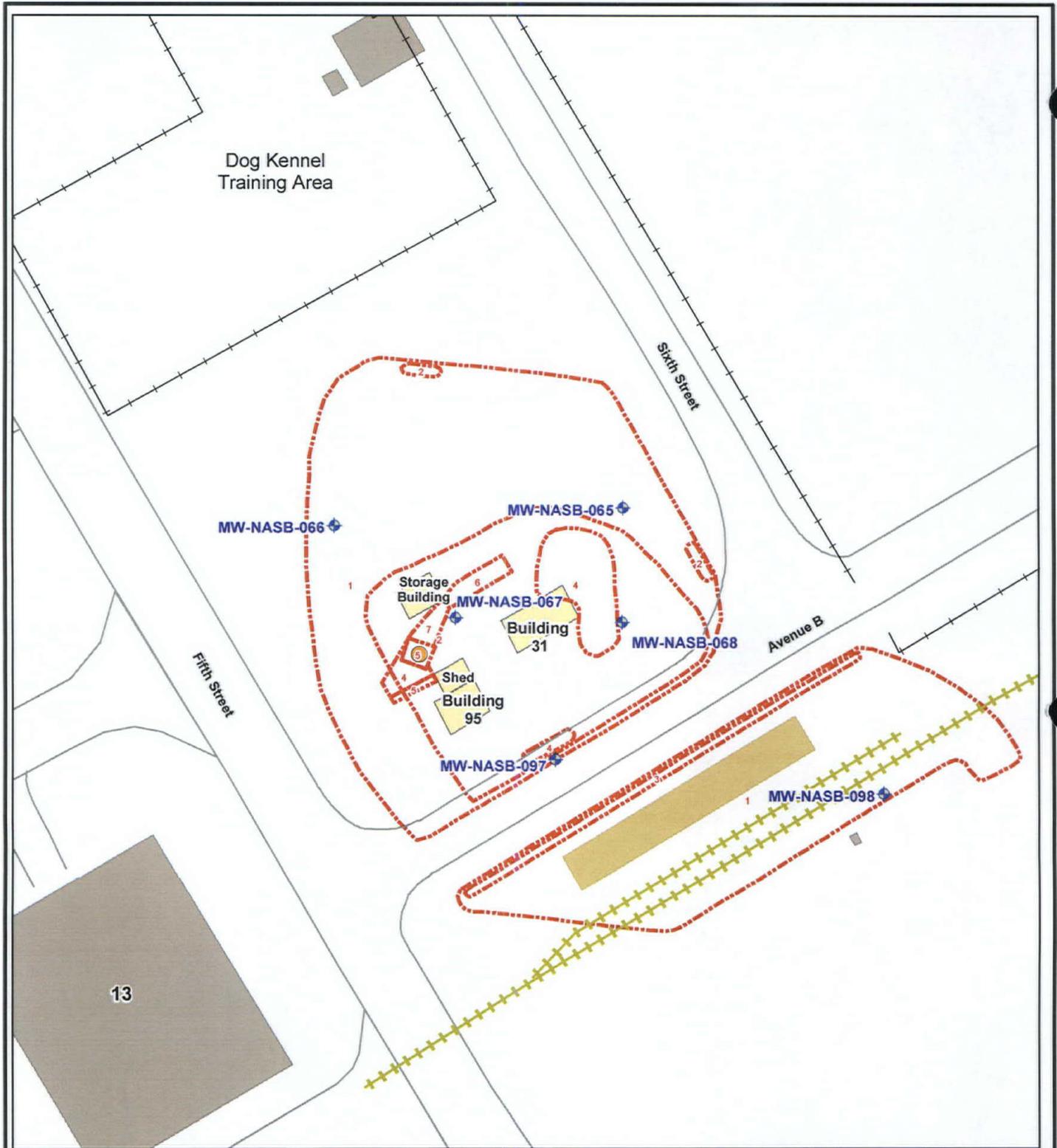
**Site 17 Site Location Map**

Naval Air Station Brunswick, Maine

ECC GIS  
C:\NAVY\_GIS\T007\_Brunswick\Bldg56\MapDocuments\Fig1-1\_Bldg56\_SiteLoca.mxd

0 800 1,600 3,200 Feet

Date	Rev.	Date	App. By
04-MAY-2007			
DB	C. Guide		
CB	G. Calderone		
AB			



Contract No.	N62472-02-D-0810			
Description	Site 17 Site Map			
Coordinate system	NAD 1983, UTM, Zone 19 N in meter			
Sources	Naval base boundary provided by Navy.			
Date	16-MAY-2007	Rev.	Date	App. By
DB	C. Guido			
CB	G. Calderone			
AB				



**Legend**

- Monitoring Well
- Former Location of Septic Tank
- Fence
- Rail Road Track (Abandoned)
- Former Building
- Building
- Soil Relocation Area (Approximate)
- Excavation Boundary (Approximate)
- Soil Excavation Depth Limits (ft)

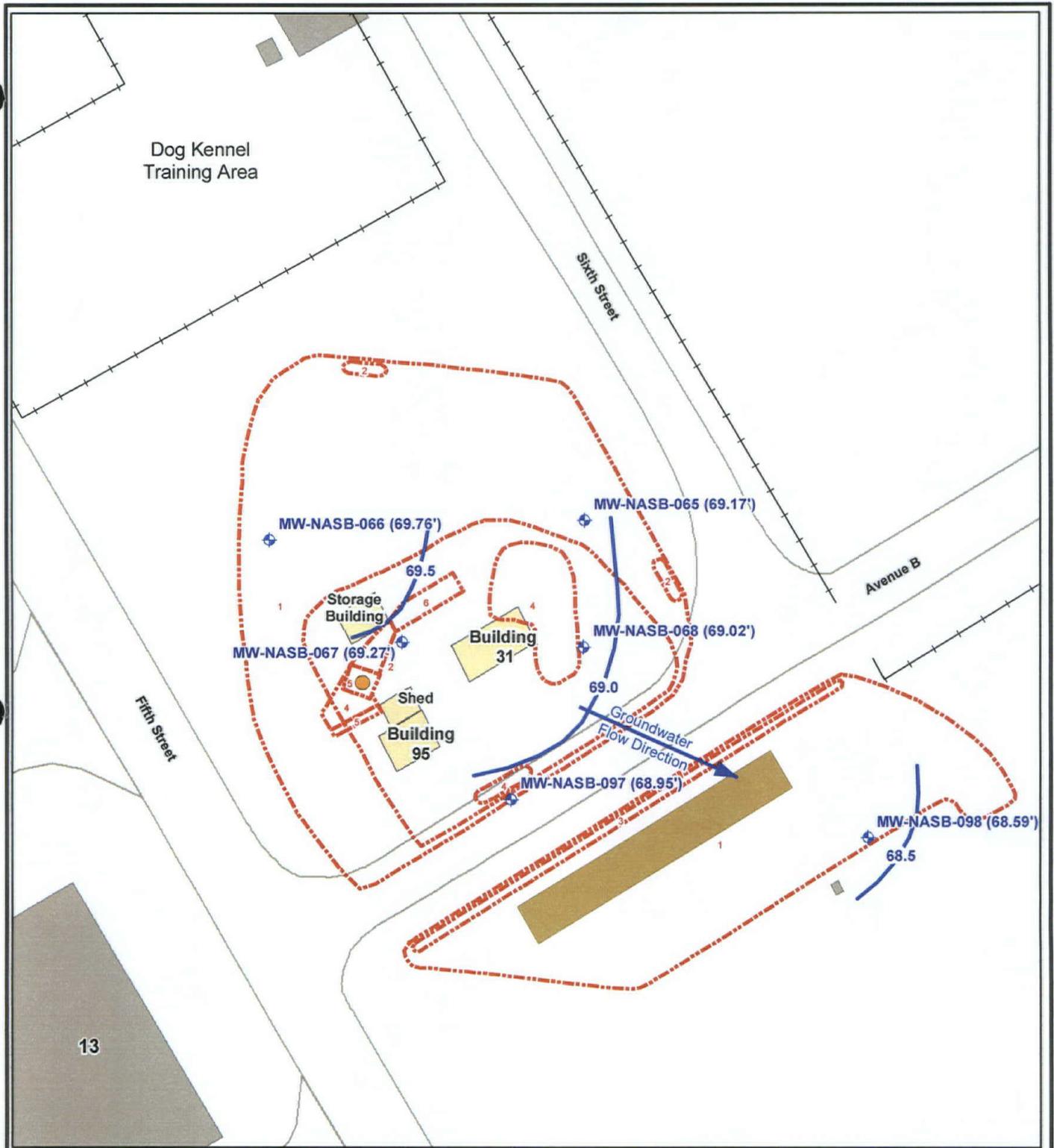
**Figure 1-2**

**Site 17 Site Plan**

Naval Air Station  
Brunswick, Maine

ECC Marlborough, MA  
GIS C:\NAVY\_GIS\TO07\_Brunswick\Bldg95\MapDocuments\Fig1-2\_Bldg95\_SiteMap.mxd

0 12.5 25 50 Feet



Contract No.	N62472-02-D-0810			
Description	Site 17 Contour Map			
Coordinate system	NAD 1983, UTM, Zone 19 N in meters			
Sources	Naval Base Boundary provided by Navy.			
Date	16-MAY-2007	Rev.	Date	App. By
DB	C. Guido			
CB	G. Calderone			
AB				



- Legend**
- Monitoring Well
  - Former Location of Septic Tank
  - Bldg95\_GWcontours\_April06
  - Inferred Groundwater Contour (ft MSL) - Sept 06
  - Soil Relocation Area (Approximate)
  - Excavation Boundary (Approximate)
  - Former Building
  - Soil Excavation Depth Limits (ft)

**Figure 1-3**

**Site 17  
Inferred Groundwater  
Contour Map  
September 2006**

Naval Air Station  
Brunswick, Maine

ECC Marlborough, MA  
GIS C:\NAVY\_GIST007\_Brunswick\Bldg95  
MapDocuments\Fig1-3\_Bldg95\_GWcontour.mxd

0 12.5 25 50 Feet

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## **APPENDIX A**

### **HISTORICAL SUMMARY OF THE BUILDING 95 SITE**

#### **A.1 INTRODUCTION**

Building 95 and surrounding structures were the pesticide/herbicide storage area and distribution center for NAS Brunswick until 1985. These structures were demolished by the Navy, and currently the site is grassed over. The site has level topography and no surface water drainage features. Previous investigations identified the presence of several herbicides and pesticides, including 4,4'-DDT and pyrethrins (an insecticide), in the soil and on structures at the site. Additionally, in 1993, low concentrations of pesticides and inorganics were reported in groundwater samples (ABB-ES 1993<sup>1</sup>).

Site 17 (Building 95) is the designated tracking name for this former pesticide building. The site is not part of the National Priorities List and, therefore, is not subject to Comprehensive Environmental Response, Compensation, and Liability Act Five-Year Reviews. At the Building 95 site, the Navy is currently performing long-term monitoring, maintenance, and corrective measures as part of the long-term remedial actions required by the Action Memorandum dated April 1993 (ABB-ES 1993), and in accordance with the May 2000 Long-Term Monitoring Plan (LTMP) (EA 2000<sup>2</sup>).

In October 2003, under Contract No. N62472-02-D-0810, Contract Task Order No. 009, Environmental Chemical Corporation began to perform long-term monitoring at the Building 95 Site at Naval Air Station (NAS), Brunswick, Maine. Prior to October 2003 the Building 95 Site has been monitored since March 1995. NAS Brunswick is located south of the Androscoggin River between Brunswick and Cooks Corner, Maine.

#### **A.2 SITE BACKGROUND**

In 1994, a LTMP was established for Building 95 (ABB-ES 1994<sup>3</sup>). On 23 June 1994, the Navy received approval of the original LTMP from the U.S. Environmental Protection Agency (EPA) and State of Maine Department of Environmental Protection (MEDEP). During November-December 1994, corrective measures were taken at the site by ABB-ES following the completion of a baseline risk assessment. The remedial measures included: excavation of the upper 1-7 ft of soil, placement of permeable geotextile liner at the bottom of the excavation to act as a marker of the limit of excavation, and the addition of clean backfill.

- 
1. ABB Environmental Services (ABB-ES). 1993. Action Memorandum, Building 95. April.
  2. EA Engineering, Science, and Technology, Inc. 2000. Final Long-Term Monitoring Plan, Building 95, Naval Air Station, Brunswick, Maine. May.
  3. ABB-ES. 1994. Final Long-Term Monitoring Plan Building 95, Sites 1 and 3 and Eastern Plume. August.

In June 1996, due to the low detections of site contaminants, the sampling frequency was reduced from quarterly to tri-annual following approval by MEDEP and EPA (EA 1997<sup>4</sup>). Monitoring Event 9 began the initiation of annual sampling at this site.

In May 2000, the LTMP was revised based upon discussions with MEDEP, EPA, and members of the Restoration Advisory Board. The May 2000 LTMP addressed changes to the sampling locations, frequency of sample collection, collection method, and analytical methods, and the revisions were based on previously collected data; as a result, the sampling frequency was reduced based on results of the monitoring event data collected to date. The sampling frequency was changed to bi-annual sampling to occur in April and September of each year.

In April 2001, groundwater monitoring well MW-NASB-067 was returned to the long-term monitoring sampling program at the request of MEDEP. Beginning with Monitoring Event 13 (April 2001), rotenone was added to the LTMP analyte list.

In July 2001, MEDEP agreed to eliminate the pesticide avitrol as a potential second round analyte from the groundwater sampling program at Building 95 based on historical site information and analytical data (non-detect in groundwater and soil samples since 1992).

Beginning in April 2002, MEDEP and Navy agreed to eliminate Target Compound List volatile organic compounds by EPA Method 8260B, Target Compound List semivolatile compounds by EPA Method 8270C, Target Analyte List Metals by EPA Method 6000/7000 Series, and rotenone by EPA Method 635 from the groundwater monitoring program. The Navy would continue to collect and analyze groundwater samples for Target Compound List pesticides by EPA 8081A and maleic hydrazide by EPA Method 632 Modified.

In August 2002, the Navy made a request to MEDEP and EPA that the pesticide maleic hydrazide be eliminated from the LTMP at Building 95. On 13 September 2002, the EPA agreed to the elimination of maleic hydrazide from the Building 95 LTMP. However, MEDEP requested additional rounds of sampling for maleic hydrazide.

During the Fall 2002 Long-Term Monitoring Program, samples were collected and analyzed for maleic hydrazide from each of the three wells (MW-NASB-067, MW-NASB-097, and MW-NASB-098). No maleic hydrazide was detected in the samples collected from the Building 95 monitoring wells.

In Spring 2003, as a result of discussions between MEDEP and Navy, it was determined well MW-NASB-097 would be sampled for maleic hydrazide, but only after the water level had reached 71.5 ft mean sea level or higher elevation, which represented seasonal high groundwater conditions.

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4. EA Engineering, Science, and Technology, Inc. 1997. Final Monitoring Event 9 – August 1997, Building 95, Naval Air Station, Brunswick, Maine. November.

*Appendix A – Historical Summary of Site  
Building 95  
Monitoring Event 24 Report, September 2006  
Naval Air Station, Brunswick, Maine  
Contract No.: N62472-02-D-0810, Contract Task Order No. 007*

In April 2003, the water level had reached the 71.5 ft mean sea level and was sampled for maleic hydrazide at well MW-NASB-097. No maleic hydrazide was detected in the sample collected from well MW-NASB-097.

On 5 September 2003, the Navy issued a letter to MEDEP requesting that maleic hydrazide be eliminated from the LTMP at Building 95. MEDEP concurred to the Navy's 5 September 2003 request on 16 September 2003.

## Water Well Gauging Summary

**BUILDING 95 MONITORING WELL GAUGING SUMMARY, SEPTEMBER 2005**

Well Designation	DATE	TIME	WELL CONDITION	PID (ppm)	Depth to Water (ft below Top of PVC Riser)	COMMENTS
MW-NASB-065	9/9/06	1346	O.K.	0.0	5.12'	
MW-NASB-066	9/8/06	1355	O.K.	0.0	9.03'	
MW-NASB-067	9/9/06	1351	O.K.	0.0	5.03'	
MW-NASB-068	9/8/06	1342	O.K.	0.0	5.84'	
MW-NASB-097	9/9/06	1340	Poor	0.0	4.46'	NPPDS Road Box
MW-NASB-098	9/8/06	1358	O.K.	0.0	7.94'	

PVC = Polyvinyl chloride.

## Field Sampling Logs







## Equipment Calibration Logs

# INSTRUMENT CALIBRATION LOG

Project/Site Name Bld 95, ME

Date 9/12/06

Weather 70<sup>s</sup> clear sky

Calibrated By David C.

Instrument YSI 650mDS  
YSI 600XLm

Serial Number 01A1431 AC  
02B0815 AB

Parameters	Pre-calibration Reading	Post-calibration Reading	Temperature °C	Comments
Conductivity	1.413	1.415	20.27	
pH (7)	7.00	6.96	20.20	
pH (4)	4.00	3.92	20.67	
pH (10)	10.03	9.98	20.02	
ORP	240	241.3	20.30	
Dissolved Oxygen	100.6%	99.9%	21.79	
Barometric Pressure	764.5			

# INSTRUMENT CALIBRATION LOG

Project/Site Name Bld 95, EP

Date 9/13/06

Weather 70<sup>S</sup>, Partly cloudy

Calibrated By David C.

Instrument YSI 650MDS  
YSI 600XLM

Serial Number 02A0841 AH  
006130: AB

Parameters	Pre-calibration Reading	Post-calibration Reading	Temperature °C	Comments
Conductivity	1.413	1.398	20.15	
pH (7)	7.00	6.99	20.22	
pH (4)	4.00	3.99	20.41	
pH (10)	10.00	9.97	20.64	
ORP	240	242.8	20.98	
Dissolved Oxygen	100%	100.1%	20.16	
Barometric Pressure	764.7			

## INSTRUMENT CALIBRATION LOG

Project/Site Name NASB ME

Calibrated By Geoff Collins

Instrument/Serial Number	Pre-cal 1.0 (NTU)	Pre-cal 10 (NTU)	Post-cal 0 (NTU)	Post-cal 10 (NTU)	Date
Lamotte Turbidimeter 04168	1.0	10	1.0	10	9/8/06
Lamotte Turbidimeter 06075	1.0	10	1.0	10	9/8/06
Lamotte Turbidimeter 00568	1.0	10	1.0	10	9/8/06
Lamotte Turbidimeter 0837-3898	1.0	10	0.95	11	9/11/06
Lamotte Turbidimeter 4002-0703	1.0	10	1.0	11	9/11/06
Lamotte Turbidimeter 5729-0905	1.0	10	1.1	10	9/11/06
Lamotte Turbidimeter 5291-3504	1.0	10	0.95	9.6	9/12/06
Lamotte Turbidimeter 5729-0905	1.0	10	1.1	10	9/12/06
Lamotte Turbidimeter 0837-3898	1.0	10	1.0	10	9/12/06
Lamotte Turbidimeter 4002-0703	1.0	10	1.1	11	9/12/06
Lamotte Turbidimeter 5729-0905	1.0	10	1.1	10	9/13/06
Lamotte Turbidimeter 0837-3898	1.0	10	0.99	9.9	9/13/06

## INSTRUMENT CALIBRATION LOG

Project/Site Name NASB MT

Calibrated By Geoff C.

Instrument/Serial Number	Pre-cal 1.0 (NTU)	Pre-cal 10 (NTU)	Post-cal 1.0 (NTU)	Post-cal 10 (NTU)	Date
Lamotte Turbidimeter 5291-3504	1.0	10	0.95	9.8	9/13/06
Lamotte Turbidimeter 4002-0703	1.0	10	1.0	10	9/13/06
Lamotte Turbidimeter 5291-3504	1.0	10	0.90	10	9/14/06
Lamotte Turbidimeter 4002-0703	1.0	10	1.3	9.8	9/14/06
Lamotte Turbidimeter 5729-0905	1.0	10	1.1	11	9/14/06
Lamotte Turbidimeter 0837-3898	1.0	10	1.0	10	9/14/06
Lamotte Turbidimeter 5291-3504	1.0	10	1.0	10	9/15/06
Lamotte Turbidimeter 4002-0703	1.0	10	not used		9/15/06
Lamotte Turbidimeter 5729-0905	1.0	10	1.0	11	9/15/06
Lamotte Turbidimeter 0837-3898	1.0	10	0.95	10	9/15/06
Lamotte Turbidimeter 0837-3898	1.0	10	1.0	9.8	9/18/06
Lamotte Turbidimeter 5729-0905	1.0	10	1.1	10	9/18/06

**Chain-of-Custody Forms**



## APPENDIX C

### ANALYTICAL DATA QUALITY REVIEW BUILDING 95 MONITORING EVENT 24

#### C.1 INTRODUCTION

This project utilized both field and analytical laboratory quality control (QC) measures to ensure that the data quality objectives presented in the Base-Wide Quality Assurance Project Plan (QAPP) were met.

For the analyses for this site, the laboratory was provided with all field samples, which included the field quality control samples. Field duplicates were collected at the frequency required by the QAPP.

Samples were sent to Accutest Laboratories in Marlborough, Massachusetts. Accutest Laboratories is NFESC and NELAC certified.

Analytical quality control was reviewed for compliance against the measurement performance criteria for precision and accuracy for each sample and analysis type, including field sample duplicates, as presented in the Long Term Monitoring Plan (LTMP) QAPP. Assessment of analytical precision was based upon the relative percent difference (RPD) of the matrix spike/matrix spike duplicates (MS/MSD). Assessment of accuracy was based upon the reported spike recoveries for the laboratory control sample (LCS), MS/MSD, and surrogate recoveries.

The ability of the laboratory to extract compounds is confirmed by the recoveries of the surrogate spikes. MS/MSD and surrogate spike recoveries measure the effect of the sample matrix on sample preparation and measurement methodology. During the MS/MSD process, known quantities of target compounds are spiked into the sample matrix, and recoveries are used to measure potential bias due to matrix effects. The MS/MSD RPD is used to determine analytical precision, and the field duplicate RPD is used to determine overall precision. The accuracy of the LCS spike recoveries is used in conjunction with MS/MSD when evaluating organic analyses.

Field completeness was quantified by reviewing the scheduled number of samples as compared to the number of samples actually collected. Data completeness was quantified by determining the ratio of the number of non-rejected analyte measurements to the total number of analyte measurements.

For clarity, the following terms are defined for use throughout this appendix:

- **Method Detection Limit** – Method detection limit (MDL) refers to the minimum concentration that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero.
- **Practical Quantitation Limit** – The practical quantitation limit (PQL) is defined as the lowest concentration that can be reasonably achieved within specified units of precision and accuracy during routine laboratory operating conditions.
- **Method Reporting Limit** – The method reporting limit (MRL) is defined as the Project Quantitation Limit adjusted for any necessary sample dilutions, percent moisture, sample volume deviations, and/or extract/digestate volume deviations.
- **Measurement Performance Criteria** – The measurement performance criteria (MPC) define the acceptable performance for the data quality indicators- accuracy and precision. The LTMP QAPP specifies the MPC for LCS, surrogates, MS/MSD, and MS/MSD RPD quality control checks.
- **Precision** - Precision is evaluated by comparing the RPD of the MS/MSD pair to the QAPP RPD limits. If the RPD is outside the MPC, the detect or non-detect is qualified for the affected compound in the unspiked sample (U.S. EPA 1996)<sup>1</sup>. The overall precision is determined by comparing the field duplicate RPD to the QAPP RPD limits.
- **Accuracy** - Accuracy is evaluated by comparing MS/MSD recoveries, surrogate spike recoveries, and LCS recoveries to QAPP MPC.
- **J** – Data qualifier indicating that the analyte was positively identified; however, the concentration is approximate.
- **UJ** - Data qualifier indicating that the analyte was not detected above the MRL, and the reporting limit is approximate.
- **U** - The parameter was analyzed, but was not detected above the sample MDL.
- **R** - The sample result was rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

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<sup>1</sup> U.S. Environmental Protection Agency, Region I-New England, "Region 1, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses," (July, 1996; Revised Dec, 1996).

## **C.2 LABORATORY ANALYTICAL QUALITY CONTROL PROGRAM**

Aqueous samples collected from the three monitoring wells were analyzed for QAPP Target Compound List (TCL) pesticides by EPA SW-846 Method 8081A. The quality control measures specified in the EPA SW-846 methodology (MS/MSD, surrogates, and LCS), as well as those in the QAPP, were performed at the proper frequency by the laboratory and established proper analytical quality control. The range of results for the accuracy and precision data quality objectives are discussed in the subsections below.

### **C.2.1 LABORATORY ACCURACY EVALUATION**

Procedures for accuracy assessment are summarized in this section.

#### **C.2.1.1 Evaluating Matrix Spike/Matrix Spike Duplicate Recoveries for Accuracy**

Generally, no action is taken based on the MS/MSD recoveries alone to qualify an entire sample delivery group. The qualification is limited to the unspiked parent sample. However, professional judgment may be used to qualify samples across a particular sample delivery group (i.e., all associated samples). Standard procedures for qualifying field sample results for MS/MSD recoveries are summarized below.

- If the spike recovery is greater than the upper control limit (UCL), then the detects are estimated (J) and the non-detects are not impacted for the affected compounds in the unspiked sample.
- If the spike recovery is greater than or equal to 10 percent, but less than the lower control limit (LCL), then the detects are estimated (J) and the non-detects are estimated (UJ) for the affected compounds in the unspiked sample.
- If the spike recovery is less than 10 percent, then the detects are estimated (J) and the non-detects are rejected (R) for the affected compounds in the unspiked sample.

#### **C.2.1.2 Evaluating Surrogate Recoveries for Accuracy**

Procedures for qualifying field sample results for surrogate recoveries are summarized below. Surrogate recovery assessments are sample-specific.

- If the surrogate recovery is greater than the UCL, all detects are estimated (J) and the non-detects are not affected (U.S. EPA 1996).
- If the surrogate recovery is greater than or equal to 10 percent, but less than the LCL, then all detects are estimated (J) and all non-detects are estimated (UJ).
- If the surrogate recovery is less than 10 percent, then the detects are estimated (J) and all non-detects are rejected (R).

### **C.2.1.3 Evaluating Laboratory Control Sample Recoveries for Accuracy**

Procedures for qualifying field samples for LCS recoveries are summarized below. LCS assessments are generally applied to an entire sample batch.

- If the LCS recovery is greater than the UCL, the detects are estimated (J) and the non-detects are not affected (U.S. EPA 1996).
- If the LCS recovery is greater than or equal to 10 percent, but less than the LCL, the detects are estimated (J) and the non-detects are estimated (UJ).
- If the LCS recovery is less than 10 percent, the detects are estimated (J) and the non-detects are rejected (R).

### **C.2.1.4 Evaluating Laboratory Method Blanks for Accuracy**

Procedures for qualifying field samples for method blank results are summarized below. Method blank assessments are generally applied to an entire sample batch.

- Method blank results should not have any analyte detections greater than the MRL.
- Analytes detected in field samples are evaluated at a five or ten times (for common laboratory cross-contaminants) the levels of those analytes in the associated method blank.
- Field samples associated with the method blank, which have detected analyte levels less than five or ten times (for common laboratory cross-contaminants) the corresponding analyte level in the method blank, are qualified as non-detect (U) for that analyte.
- Field samples associated with the method blank, which have detected analyte levels greater than five or ten times (for common laboratory cross-contaminants) the corresponding analyte level in the method blank, are not qualified.

## **C.2.2. LABORATORY ACCURACY ASSESSMENT**

Project-specific assessment of laboratory accuracy is detailed in this section.

### **C.2.2.1 Target Compound List Pesticides**

Accuracy assessment for target compound list pesticides analysis is detailed in this section. For this site, only pesticides analysis was performed.

#### **C.2.2.1.1 Surrogates**

The sample surrogate recoveries were within the QAPP MPC. Sample extraction was acceptable and without bias.

#### **C.2.2.1.2 Matrix Spike and Matrix Spike Duplicate**

All compounds were used to assess the MS/MSD recoveries on parent sample MW-097. The MS/MSD recoveries were within the QAPP MPC, and no qualifications were assigned.

#### **C.2.2.1.3 Laboratory Control Sample**

All of the pesticide compounds were used to assess the LCS recoveries. All LCS recoveries were within MPC. Laboratory accuracy was acceptable.

#### **C.2.2.1.4 Method Blank**

The method blank had non-detects for the pesticide compounds.

### **C.2.3 LABORATORY PRECISION EVALUATION**

Procedures for precision assessment are summarized in this section

#### **C.2.3.1 Evaluating Matrix Spike/Matrix Spike Duplicate Relative Percent Differences for Laboratory Precision**

Generally, no action is taken based on the MS/MSD RPDs alone to qualify an entire sample delivery group. The qualification is limited to the unspiked sample associated with the MS/MSD. However, professional judgment may be used to qualify samples across a particular sample delivery group (i.e., all associated samples). All QAPP pesticide compounds are used to assess the MS/MSD RPDs.

If the MS/MSD RPD is greater than 30%, the result for the outlier compound is qualified as estimated (J for detects and UJ for non-detects) in the native sample.

### **C.2.3.2 Evaluating Laboratory Replicate Relative Percent Differences for Laboratory Precision**

If the laboratory replicate RPD is greater than 20% and if the analyte concentration is greater than the MRL, then sample results are qualified as estimated (J for detects and UJ for non-detects). Laboratory replicates are generally analyzed for inorganic analyses. This sampling event called for pesticides analysis only at this site, so there were no laboratory replicate data.

### **C.2.4 LABORATORY PRECISION ASSESSMENT**

Project-specific assessment of precision is detailed in this section.

#### **C.2.4.1 Target Compound List Pesticides**

Precision assessment for target compound list pesticides analysis is detailed in this section. For this site, only pesticides analysis was performed.

##### **C.2.4.1.1 Matrix Spike and Matrix Spike Duplicate Relative Percent Differences**

The MS/MSD, performed on native sample MW-097, had RPDs within the established control limits.

### **C.3 FIELD SAMPLING PROGRAM QUALITY CONTROL**

Field duplicates are collected and analyzed for the same parameters as the primary environmental samples to determine field sampling precision.

#### **C.3.1 FIELD PRECISION EVALUATION**

Procedures for assessment of field precision are summarized in this section.

### C.3.1.1 Evaluating Field Duplicate Results for Precision

Field duplicates are collected during the sampling programs for monitoring well/groundwater, leachate seep sediment, surface water, and leachate seep areas, as appropriate. The sample locations of the field duplicate samples are not identified to the laboratory. Field duplicate results are used to evaluate the overall precision of both the field and laboratory. EPA Region 1 criteria are used to evaluate the field duplicate results. Field duplicate assessments are generally applied only to the field duplicate and primary field sample; however, professional judgment may be used to qualify samples across a particular sample delivery group.

Procedures for qualifying field samples for field duplicate results are summarized below.

- Field sample and field duplicate sample results greater than twice the MRL are evaluated and the RPDs are calculated. A detect greater than the MRL in one but non-detect in another sample of the field duplicate pair are qualified as estimated (J for detects and UJ for non-detects).
- The overall precision is evaluated as being acceptable if less than 30 percent.

### C.3.2 FIELD PRECISION ASSESSMENT

Field precision assessment for the pesticides analyses are detailed in this section. Field duplicate criteria are 30% for aqueous samples and 50% for solids.

For this site, for this sampling event, only pesticides analysis was performed.

#### C.3.2.1 Field Duplicates

One field sample and corresponding field duplicate sample, listed in the following table, was collected during the 24<sup>th</sup> monitoring event:

Field Duplicate Location	Site Sample ID	Duplicate Sample ID	Analyses
MW-098	BN-95-24-MW098	BN-95-24-MW-XD1	Pesticides

#### **C.3.2.1.1 Field Duplicate RPDs**

The aqueous field duplicate and field sample were considered to be in agreement and field precision and overall precision was acceptable for all pesticide compounds. Both the field sample and the field duplicate had non-detects for all target compounds. No qualifications were required.

### **C.3.3 FIELD ACCURACY EVALUATION**

Procedures for assessment of field accuracy are detailed in this section.

#### **C.3.3.1 Evaluating Rinsate Blanks for Field Accuracy**

Procedures for qualifying field samples for rinsate blank results are summarized below. Equipment blank qualifications are specific to the samples for which a rinsate blank is considered representative. Analysis of a rinsate blank collected from non-dedicated and/or non-disposable equipment is used to evaluate potential field cross contamination.

- Rinsate blank results should not have any analyte detections greater than the MRL.
- Analytes detected in field samples are evaluated at five or ten times (for common laboratory cross-contaminants) the detections of those analytes the associated rinsate blank.
- Field samples associated with the rinsate blank, which have detected analyte levels less than five or ten times (for common laboratory cross-contaminants) the corresponding analyte level in the rinsate blank, are qualified as non-detect (U) for that analyte.
- Field samples associated with the rinsate blank, which have detected analyte levels greater than five or ten times (for common laboratory cross-contaminants) the corresponding analyte level in the rinsate blank, are not qualified.

### **C.3.3.2 Evaluating Trip Blanks for Field Accuracy**

Procedures for qualifying field samples for trip blank results are summarized below. Trip blank qualifications are specific to the samples for which a trip blank is considered representative. VOC analysis of a trip blank shipped with sample shipment coolers containing VOC samples is performed to assess any VOC contamination introduced during sample handling and shipping.

- Trip blank results should not have any analyte detections greater than the MRL.
- Compounds detected in VOC field samples are evaluated at a five or ten times (for common lab cross contaminants) the detections in the associated trip blank.
- VOC field samples associated with the trip blank, which have detected compound levels less than five or ten times (for common lab cross contaminants) the corresponding level in the trip blank, are qualified as non-detect (U) that compound.
- VOC field samples associated with the trip blank, which have detected compound levels greater than five or ten times (for common lab cross contaminants) the corresponding level in the trip blank, are not qualified.

### **C.3.4 FIELD ACCURACY ASSESSMENT**

Project-specific assessment of field accuracy is detailed in this section.

#### **C.3.4.1 Target Compound List Pesticides**

Field accuracy assessment for pesticides analysis is detailed in this section. For this site, for this sampling event, only pesticides analysis was performed.

##### **C.3.4.1.1 Rinsate Blanks**

Rinsate blanks were not collected during this monitoring event as dedicated or disposable sampling equipment was used for sample collection. Dedicated and disposable sampling equipment minimized the possibility of sample cross contamination in the field.

##### **C.3.4.1.2 Trip Blanks**

Trip blanks are not required for pesticide analyses.

#### C.4 OVERALL EVALUATION OF DATA AND USABILITY RECOMMENDATION

The following is a summary table of the findings for the data quality review performed and discussed in detail in this appendix:

Data Quality Review		Holding Time	Field/Method Blank Contamination	Precision		Accuracy			Completeness	
				Laboratory	Field	Surrogate	MS/MSD	LCS	Analytical	Field
Matrix: Aqueous	QAPP TCL Pesticides – 8081A	√	√	√	√	√	√	√	100%	100%
NOTE: √ = The data are usable as reported based on the data quality review of this quality measurement.										

Field samples collected and analyzed as part of Building 95 Event 24 were validated and found to meet the data quality objectives established in the QAPP for data usability.

#### C.5 COMPLETENESS

Analytes were reviewed for method and QAPP compliance, and the data were determined to be usable because no data were rejected for this sampling event. Therefore, the analytical completeness for field samples is 100 percent. The planned number of field samples and the corresponding quality control samples (field duplicate) were collected, resulting in a field completeness of 100 percent.

## C.6 METHOD DETECTION LIMITS

The following table provides the MDLs for the analytes reported for this site for this sampling event. The MDL represents the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero.

The validator noted that MRLs for heptachlor epoxide and dieldrin exceeded the PQLs listed in the QAPP; however, the values were compared to the Maximum Exposure Guidelines <sup>2</sup> (MEGs) for the State of Maine and the MDLs for these compounds are less than the MEGs and maximum contaminant levels (MCLs).

Analytical Method	Matrix	Analyte	MDL	Units
SW8468081	Aqueous	4,4'-DDD	0.0096	ug/L
SW8468081	Aqueous	4,4'-DDE	0.010	ug/L
SW8468081	Aqueous	4,4'-DDT	0.0074	ug/L
SW8468081	Aqueous	Aldrin	0.0070	ug/L
SW8468081	Aqueous	alpha-BHC	0.0062	ug/L
SW8468081	Aqueous	Alpha-chlordane	0.0056	ug/L
SW8468081	Aqueous	beta-BHC	0.0089	ug/L
SW8468081	Aqueous	Chlordane	0.22	ug/L
SW8468081	Aqueous	Delta-BHC	0.013	ug/L
SW8468081	Aqueous	Dieldrin	0.00679	ug/L
SW8468081	Aqueous	Endosulfan-I	0.0089	ug/L
SW8468081	Aqueous	Endosulfan-II	0.0081	ug/L
SW8468081	Aqueous	Endosulfan sulfate	0.0093	ug/L
SW8468081	Aqueous	Endrin	0.013	ug/L
SW8468081	Aqueous	Endrin aldehyde	0.0083	ug/L
SW8468081	Aqueous	Endrin ketone	0.0094	ug/L
SW8468081	Aqueous	gamma-BHC (Lindane)	0.0099	ug/L
SW8468081	Aqueous	Heptachlor	0.0090	ug/L
SW8468081	Aqueous	Heptachlor epoxide	0.0089	ug/L
SW8468081	Aqueous	Methoxychlor	0.0074	ug/L

<sup>2</sup> Maine Department of Human Services, Environmental and Occupational Health Program, Center for Disease Control, "Maine CDC Maximum Exposure Guidelines (MEGs) for drinking water," (August 7, 2006).



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**DATA VALIDATION MEMORANDUM**  
**NAS BRUNSWICK SITE BLDG 95**  
**JUNE 2006 SAMPLING ROUND 24 (SDG M59202)**

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**TO:** ENGINEERING FACILITY COMMAND NORTHEAST  
**FROM:** JACKSON KIKER, ECC SENIOR CHEMIST, MARLBOROUGH, MA  
**SUBJECT:** NAS BRUNSWICK SITE BLDG 95 MONITORING EVENT 24  
**DATE:** 11/14/2006

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Project data were validated using the following Validation Functional Guidelines, as modified for non-CLP methods and project-specific QAPP measurement performance criteria (MPC):

1. Region I, EPA-NE Data Validation Functional Guidelines for Evaluation of Environmental Analyses (Dec, 1996),
2. National Functional Guidelines for Evaluation Inorganic Analysis (1988), and
3. National Functional Guidelines for Evaluation Organic Analysis (October 1999).

The data were assessed against the MPC listed in the approved Bldg 95 LTMP QAPP (May 2000). The QAPP MPC and validation guideline exceedences are assessed and documented on the method/QAPP specific data validation worksheets. On these data validation worksheets the data quality acceptance criteria are presented, analytes requiring qualification based on MPC and/or validation guidance criteria exceedences are listed, assigned qualifiers, qualifying rationale is documented, and any potential bias noted. The overall evaluation of the data generated by a method is presented in the data validation worksheet.

Standard EPA Region I data qualifiers are used to denote the assessment of data quality. The final and ranking assigned data qualifier for an analyte is presented in the data summary table. Ancillary qualifiers are noted on the data validation worksheets.

The USEPA Region I Organic Regional Data Assessment (ORDA) sheet displays the summarized results of the data validation assessment for all analytical methods reported in the SDG.



## ACRONYMS AND ABBREVIATIONS

Following is a list of acronyms and abbreviations that may be used in the data validation reports.

<b>Acronym or Abbreviation</b>	<b>Definition</b>
%D	Percent difference
%R	Percent recovery
Ug/L	Microgram per liter
BD	Breakdown
BEHP	2-bis(ethylhexyl)phthalate
BFB	Bromofluorobenzene
CCB	Continuing calibration Blank
CCC	Continuing Check Compound
CCV	Continuing Calibration Verification
COC	Chain of custody
CRI	standard at RL for ICP
CVAA	Cold vapor atomic absorption
DFTPP	Decafluorotriphenylphosphine
DQO	Data quality objective
EB	Equipment blank
EPA	Environmental Protection Agency
FD	Field duplicate
GC	Gas Chromatography
GC/MS	Gas chromatography/mass spectrometry
HT	Holding time
ICAL	Initial calibration
ICS-A/AB	Interelement check standard A or AB
ICV	Initial calibration verification
IDL	Instrument detection limit
IS	Internal standards
LCL	Lower control limit
LCS	Laboratory control sample
LTMP	Long term monitoring plan
MeCl	Methylene chloride
MS	Matrix spike
MSD	Matrix spike duplicate
MPC	Measurement performance criteria



<b>Acronym or Abbreviation</b>	<b>Definition</b>
NA	Not applicable
NC	Not calculated.
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyls
PQL	Practical quantitation limit
QAPP	Quality Assurance Project Plan
QC	Quality control
RF	Response Factor
RPD	Relative percent difference
RRF	Relative response factor
RSD	Relative standard deviation
RT	Retention time
SDG	Sample Delivery Group
SOP	Standard Operation Procedure
SVOC	Semi-volatile organic compound
SPCC	System performance check compound
SQL	Sample Quantitation Limit
TB	Tripblank
TCX	Tetrachloro-m-xylene
TIC	Tentatively identified compound
UCL	Upper control limit
VOC	Volatile organic compound



## DATA QUALIFIER REFERENCE TABLE

Data validation reports will summarize the samples reviewed, elements reviewed, any nonconformances with the established criteria, validation actions (including data qualifiers). Data qualifiers will be consistent with EPA Region I – New England guidelines and will consist of the following:

<b>USEPA Region I – Data Qualifier</b>	<b>USEPA Region I – Qualifier Definition</b>
<b>J</b>	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample
<b>UJ</b>	The analyte was not detected above the sample reporting limit; and the reporting limit is approximate
<b>U</b>	The sample was analyzed for, but was not detected above the sample reporting limit.
<b>R</b>	The sample result is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified



## Region I, EPA-NE ORGANIC REGIONAL DATA ASSESSMENT

LAB NAME: NorthEast Laboratory  
SDG #: M59202  
EPA-NE DV TIER LEVEL: II  
SITE NAME: NAS Brunswick -BLDG 95

# of SAMPLES/MATRIX: BLD 95: 3 groundwater, 1 FD:  
VALIDATION CONTRACTOR: ECC/ASW  
VALIDATOR'S NAME: Sherri Pullar  
DV Completion Date: November 15, 2006  
Date Sampled: 11, 13, & 14 September 2006

### ANALYTICAL DATA QUALITY SUMMARY

	Review Item	Pesticide
1	Preservation and HT	O
2	Instrument Performance Check	O
3	Initial Calibration:	M
4	Continuing Calibration:	M
5	Blanks:	O
6	Surrogate Compounds:	O
7	Internal Standards	-
8	Matrix Spike/Matrix Spike Duplicate:	O
9	Sensitivity Check:	O
10	PE Samples- Accuracy Check	O
11	Target Compound Identification:	O
12	Compound Quantitation and Reported QLs	O
13	Tentatively Identified Compounds:	-
14	Semivolatile/Pesticide/PCB Cleanup:	-
15	Data Completeness	O
16	Overall Evaluation of Data:	O

O = Data had no problems or were qualified due to minor contractual problems; M = Data were qualified due to major/systemic MPC exceedences; Z = Data were rejected as unusable due to major contractual problems.

**ACTION ITEMS: (Z items):** None

**AREAS OF CONCERN: (M items):**

**Pesticide:** Detect results for 4,4'-DDD and 4,4'-DDT were qualified J in sample 1 due to DDT breakdown outside MPC limits. Results for 4,4'-DDT in samples 2,3, & 4 and endrin aldehyde in samples 1-4 were qualified UJ due to %D's or %Area's were outside MPC limits. Results for alpha-BHC, gamma-BHC, heptachlor, delta-BHC, aldrin, dieldrin, 4,4'-DDD, and methoxychlor were qualified UJ in samples 1-4 due to CCV %D outside MPC limits.

**COMMENTS:** None.



Data Validation Level	Matrix	Preservation	Temperature Sample Receipt	Laboratory	SDG Number
Tier II	Ground water	-	1 batch – temp < 6°C	Accutest Laboratories Marlborough, MA	SDG: M59202

**Field Identification of Samples Evaluated:**

Field ID	Lab Sample Number
BN-95-24-MW067	M59202-1
BN-95-24-MW097	M59202-2
BN-95-24-MW098	M59202-3
BN-95-24-MW-XD1	M59202-4 (field duplicate for M59202-3)

Note: Samples are described below in the data worksheets by reference to the last two digits of the Lab Sample Number

REVIEW ITEMS	MEASUREMENT PERFORMANCE CRITERIA (MPC)	SAMPLES AFFECTED	Inventory	QUAL	BIAS
COC	1) Unbroken custody (accept or if broken R) 2) Temp ≤ 6° ( Soil-J detects, R -nondetects 3) preserved per method (amber bottles, temperature, J, UJ, or R (function of HT and compound))	Cooler temperature < 6 °C. Sample preservation adequate. Sample custody transferred from Field Team Leader to lab sample courier. Unbroken Chain of Custody. Sample preservation within limits. No samples qualified.	X	-	
Holding Time	1) 7 Days water, 14 days soil (40 days for extract) 2) J –detects, UJ or R –nondetects (function of time)	Date Sampled: September 11, 13, and 14, 2006. Extraction Date: September 18, 2006. Analysis Date: September 28 & 29, 2006. All samples extracted and analyzed within holding time. No samples qualified.	X	-	
% Solids Check (SOLIDS)	30% < Solids: if no sample weight adjustment made (no USACE ) 1) < 10% R entire sample 2) 10% > and < 30%; J-detects, NDs -R	Not applicable	-	-	
Results > Cal Range or < Cal Range	1) > Upper Cal Range J-detects - ensure instrument blank performed 2) < PQL but > MDL – J –detects (estimated)	Attached data summary table. No detected results below the calibration range.	X	-	
Equip Blank	< 5x (< 10x common) contaminants for aq samples – for soil indicate EB (X rules don't apply)	No rinsate blank collected in this SDG.	-	-	
Surrogates	Surrogate acceptance limits not specified in the LTMP. Use laboratory statistical limits. TMX 30-122% DCB 30-133% Qualification: >UCL J –detects, %R < 10% J –detects, R –NDs, %R > 10% but < 60% J-detects, UJ NDs	All surrogate %R's within MPC limits No samples qualified.	X	-	
Lab Blanks (method blanks)	1) < 5x (< 10x common) contaminants – U 2) analytes < lab PQL (contract lab)	No TCL pesticides detected in the associated MB sample. No samples qualified.	X	-	



REVIEW ITEMS	MEASUREMENT PERFORMANCE CRITERIA (MPC)	SAMPLES AFFECTED	Inven-tory	QUAL	BIAS
LCS Recovery	1) QAPP limits 10% and <LCL% J detects, UJ -NDs >UCL% J detects <10% R NDs, J-detects Attachment A-2 LTMP; Gamma-BHC (Lindane) 55-117% 4,4'-DDT 25-138% LCS/LCSD RPD <30%	All LCS recoveries within MPC limits. No samples qualified.	X	-	
MS/MSD Recovery	1) QAPP limits (if MS > 4X native levels) Qualification of MS sample: <10% J detects, R NDs >10% and <70% J detects, UJ -NDs >130% J detects Attachment A-2 LTMP; Gamma-BHC (Lindane) 55-117% 4,4'-DDT 25-138%	Native sample: sample 2.  MS/MSD recoveries within MPC for all pesticides spiked – no samples qualified.	X	-	
MS/MSD RPD	RPD ≤ 30% J –detects in MS sample UJ-non detects	Native sample: sample 2. MS/MSD RPDs within MPC for all pesticides spiked – no samples qualified.	X	-	
Cleanup Performance Check (if performed)	%R< 10% NDs-R detections J %R>10% <LCL (80%GPC) –detections J, NDs UJ %R>UCL (120%) – detections J Retention Time shift <5%, symmetrical peakshape. GPC check with interferants. Good surrogate recovery, GPC blank check – no carryover.(VOA/SV-IX-16). Sulfur and High MW compounds removed. SW-846 clean-up not required	NA	-	-	
Retention times	Within 3X standard deviation for each analyte from 72-hour study Exceeds: R qualify data	Within MPC limits. No samples qualified.	X	-	
Field Dup RPD	1) RPD ≤ 50% soil and <30% waters for Results >2X PQL (FD pair only) J-detects (both > X PQL) 2) If one >2X PQL, other ND, J-detections, UJ non-detect Other conditions use judgement	Field sample 3/ field duplicate 4. All compounds were non-detects in both samples. Similar results – acceptable sampling precision. No samples qualified.	X	-	
Initial Cal (Linearity)	Correct calibration stds %RSD < 20% use average RF for calibration %RSD> 20% use least squares COD (r2) > 0.990 or correlation coefficient r> 0.995 or alternatively mean %RSD <20% for all target analytes, with no analyte %RSD>40%	Instrument ID: GCBB Date: September 28, 2005. COD > 0.99 for both columns. Acceptable linearity. No samples qualified. Instrument ID: GCBE Date: September 29, 2005. COD > 0.99 for both columns. Acceptable linearity. No samples qualified.	X	-	



REVIEW ITEMS	MEASUREMENT PERFORMANCE CRITERIA (MPC)	SAMPLES AFFECTED	Inven-tory	QUAL	BIAS
DDT Degradation check	Degradation Breakdown (BD) Check every 12 hours and prior to sample analysis. DDT Breakdown: <20% for all checks associated with samples. Endrin Breakdown: <20% for check prior to sample analysis. Combined breakdown <30%. If BD>20% J detects Endrin/DDT. If BD>20% for a column, but DDT/Endrin not detected but breakdown products are detected, MRL not usable.	Instrument: GCBB Endrin breakdown within MPC limits for all applicable samples. DDT breakdown outside MPC limits for samples 1, 2, 3, & 4. Associated compounds were confirmed by reanalysis	X	Detect results for 4,4'-DDD and 4,4'-DDT were qualified J in sample 1.	
2 <sup>nd</sup> Source ICV	%R (between ICV and Ical) analytes %D ≤ 15%, (+ or -) once per 5 pt cal Qualification: J detects, R or UJ NDs	Instrument ID: GCBB Date: September 28, 2005. %D's or %Area's for 4,4'-DDT and endrin aldehyde on column 1 and heptachlor, 4,4'-DDT, endrin aldehyde, and methoxychlor on column 2 were outside MPC limits. Instrument ID: GCBE Date: September 29, 2005. %D's or %Area's were within MPC limits on both columns. No samples qualified.	X	Results for 4,4'-DDT in samples 2,3, & 4 and endrin aldehyde in samples 1-4 were qualified UJ.	
CCV	1) QAPP: 15% of initial calib. Curve (85%-115%). J qualify data. 2) Qualification-J detects, R or UJ NDs	Instrument ID: GCBB Date: September 28, 2005. %D's for alpha-BHC, gamma-BHC, heptachlor, delta-BHC, aldrin, dieldrin, 4,4'-DDD, 4,4'-DDT, endrin aldehyde, and methoxychlor on column 1 and alpha-bhc, gamma-bhc, heptachlor, delta-BHC, aldrin, gamma-chlordane, 4,4'-DDE, dieldrin, endrin, 4,4'-DDD, endosulfan-II, 4,4'-DDT, endrin aldehyde, endrin ketone, and methoxychlor on column 2 were outside MPC limits. Instrument ID: GCBE Date: September 29, 2005. All %D's for both columns were within MPC limits with the exception of 4,4'-DDT and methoxychlor on column 2. No sample qualifications.	X	Results for alpha-BHC, gamma-BHC, heptachlor, delta-BHC, aldrin, dieldrin, 4,4'-DDD, and methoxychlor were qualified UJ in samples 1-4.	
Compound Quantitation	1) Check sensitivity (MDL < 1/3 PQL or per QAPP) 2) %D <25% primary and secondary column identification and quantitation 3) Target compounds by 8081 Lindane PQL 0.05 ug/L MCL/MEG 0.2 4,4' DDT PQL 0.02 ug/L MEG/0.83	One detected result in sample 559 (4,4-DDT). Acceptable precision between the two columns. Acceptable sensitivity as all MDL are the same as PQLs listed in the QAPP (2006) excluding the following compounds: RL for heptachlor Epoxide exceeded PQL and MEG but was well below the MCL for the compound. RL for dieldrin exceeded both the PQL and	X	-	



REVIEW ITEMS	MEASUREMENT PERFORMANCE CRITERIA (MPC)	SAMPLES AFFECTED	Invent-ory	QUAL	BIAS
		MEG for the compound.			
Overall Evaluation of Data	1) Appropriate method 2) Evaluate any analytical problems 3) Evaluate sampling errors – field contamination, sample hold times	<p>The laboratory results, as qualified, are usable for making project decisions. All surrogate, LCS, and MS/MSD recoveries within MPC limits. Method blank was non-detect for all pesticides of concern. Detect results for 4,4'-DDD and 4,4'-DDT were qualified J in sample 1 due to DDT breakdown outside MPC limits. ICAL had acceptable fit for all reported pesticides. ICV: Acceptable %D for all compounds with the exception of 4,4'-DDT and endrin aldehyde on column 1 and heptachlor, 4,4'-DDT, endrin aldehyde, and methoxychlor on column 2. CCV: Date: September 28, 2005. %D's for alpha-BHC, gamma-BHC, heptachlor, delta-BHC, aldrin, dieldrin, 4,4'-DDD, 4,4'-DDT, endrin aldehyde, and methoxychlor on column 1 and alpha-bhc, gamma-bhc, heptachlor, delta-BHC, aldrin, gamma-chlordane, 4,4'-DDE, dieldrin, endrin, 4,4'-DDD, endosulfan-II, 4,4'-DDT, endrin aldehyde, endrin ketone, and methoxychlor on column 2 were outside MPC limits.</p> <p>Sampling error – Field sample 3/ field duplicate 4.</p> <p>All compounds were non-detects in both samples. Similar results – acceptable sampling precision. No samples qualified.</p>	X		

\*(Tier III check items) Completeness Check: Inventory Check Sheet   X   Sample Quantitation Calculations (TIER III ONLY):

**NAS BRUNSWICK- BUILDING 95 – SEPTEMBER 2006  
DATA SUMMARY TABLE – AQUEOUS SDG M59202**

Sample Name	Lab Id	Analytical Method	Sample Date	Dilution Factor	Analyte	Result	Unit	Qualifier	MDL	QL
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	4,4'-DDD	0.071	ug/l	J	0.0099	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Heptachlor epoxide	0.021	ug/l	U	0.0092	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Endosulfan sulfate	0.021	ug/l	U	0.0096	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Aldrin	0.021	ug/l	UJ	0.0072	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	alpha-BHC	0.021	ug/l	UJ	0.0064	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	beta-BHC	0.021	ug/l	U	0.0092	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	delta-BHC	0.021	ug/l	UJ	0.013	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Endosulfan-II	0.021	ug/l	U	0.0084	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	4,4'-DDT	0.016	ug/l	J	0.0076	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	alpha-Chlordane	0.021	ug/l	U	0.0058	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	gamma-Chlordane	0.021	ug/l	U	0.0058	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Endrin ketone	0.021	ug/l	U	0.0097	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	gamma-BHC (Lindane)	0.021	ug/l	UJ	0.010	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Dieldrin	0.021	ug/l	UJ	0.0069	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Endrin	0.021	ug/l	U	0.014	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Methoxychlor	0.021	ug/l	UJ	0.0076	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	4,4'-DDE	0.021	ug/l	U	0.010	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Endrin aldehyde	0.021	ug/l	UJ	0.0086	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Heptachlor	0.021	ug/l	UJ	0.0093	0.021
BN-95-24-MW067	M59202-1	SW8468081	09/11/06	1	Endosulfan-I	0.021	ug/l	U	0.0092	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	delta-BHC	0.021	ug/l	UJ	0.013	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Heptachlor epoxide	0.021	ug/l	U	0.0094	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Endosulfan sulfate	0.021	ug/l	U	0.0098	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Aldrin	0.021	ug/l	UJ	0.0073	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	alpha-BHC	0.021	ug/l	UJ	0.0065	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	beta-BHC	0.021	ug/l	U	0.0094	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Endosulfan-II	0.021	ug/l	U	0.0085	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	4,4'-DDT	0.021	ug/l	UJ	0.0078	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	alpha-Chlordane	0.021	ug/l	U	0.0059	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	gamma-Chlordane	0.021	ug/l	U	0.0059	0.021

Sample Name	Lab Id	Analytical Method	Sample Date	Dilution Factor	Analyte	Result	Unit	Qualifier	MDL	QL
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Endrin ketone	0.021	ug/l	U	0.0099	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	gamma-BHC (Lindane)	0.021	ug/l	UJ	0.010	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Dieldrin	0.021	ug/l	UJ	0.0070	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Endrin	0.021	ug/l	U	0.014	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Methoxychlor	0.021	ug/l	UJ	0.0078	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	4,4'-DDD	0.021	ug/l	UJ	0.010	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	4,4'-DDE	0.021	ug/l	U	0.011	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Endrin aldehyde	0.021	ug/l	UJ	0.0088	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Heptachlor	0.021	ug/l	UJ	0.0095	0.021
BN-95-24-MW097	M59202-2	SW8468081	09/13/06	1	Endosulfan-I	0.021	ug/l	U	0.0094	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Heptachlor epoxide	0.021	ug/l	U	0.0092	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Endosulfan sulfate	0.021	ug/l	U	0.0096	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Aldrin	0.021	ug/l	UJ	0.0072	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	alpha-BHC	0.021	ug/l	UJ	0.0064	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	beta-BHC	0.021	ug/l	U	0.0092	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	delta-BHC	0.021	ug/l	UJ	0.013	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Endosulfan-II	0.021	ug/l	U	0.0084	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	4,4'-DDT	0.021	ug/l	UJ	0.0076	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	alpha-Chlordane	0.021	ug/l	U	0.0058	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	gamma-Chlordane	0.021	ug/l	U	0.0058	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Endrin ketone	0.021	ug/l	U	0.0097	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	gamma-BHC (Lindane)	0.021	ug/l	UJ	0.010	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Dieldrin	0.021	ug/l	UJ	0.0069	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Endrin	0.021	ug/l	U	0.014	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Methoxychlor	0.021	ug/l	UJ	0.0076	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	4,4'-DDD	0.021	ug/l	UJ	0.0099	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	4,4'-DDE	0.021	ug/l	U	0.010	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Endrin aldehyde	0.021	ug/l	UJ	0.0086	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Heptachlor	0.021	ug/l	UJ	0.0093	0.021
BN-95-24-MW098	M59202-3	SW8468081	09/14/06	1	Endosulfan-I	0.021	ug/l	U	0.0092	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	delta-BHC	0.021	ug/l	UJ	0.013	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Heptachlor epoxide	0.021	ug/l	U	0.0092	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Endosulfan sulfate	0.021	ug/l	U	0.0096	0.021

Sample Name	Lab Id	Analytical Method	Sample Date	Dilution Factor	Analyte	Result	Unit	Qualifier	MDL	QL
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Aldrin	0.021	ug/l	UJ	0.0072	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	alpha-BHC	0.021	ug/l	UJ	0.0064	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	beta-BHC	0.021	ug/l	U	0.0092	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Endosulfan-II	0.021	ug/l	U	0.0084	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	4,4'-DDT	0.021	ug/l	UJ	0.0076	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	alpha-Chlordane	0.021	ug/l	U	0.0058	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	gamma-Chlordane	0.021	ug/l	U	0.0058	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Endrin ketone	0.021	ug/l	U	0.0097	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	gamma-BHC (Lindane)	0.021	ug/l	UJ	0.010	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Dieldrin	0.021	ug/l	UJ	0.0069	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Endrin	0.021	ug/l	U	0.014	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Methoxychlor	0.021	ug/l	UJ	0.0076	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	4,4'-DDD	0.021	ug/l	UJ	0.0099	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	4,4'-DDE	0.021	ug/l	U	0.010	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Endrin aldehyde	0.021	ug/l	UJ	0.0086	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Heptachlor	0.021	ug/l	UJ	0.0093	0.021
BN-95-24-MW-XD1	M59202-4	SW8468081	09/13/06	1	Endosulfan-I	0.021	ug/l	U	0.0092	0.021



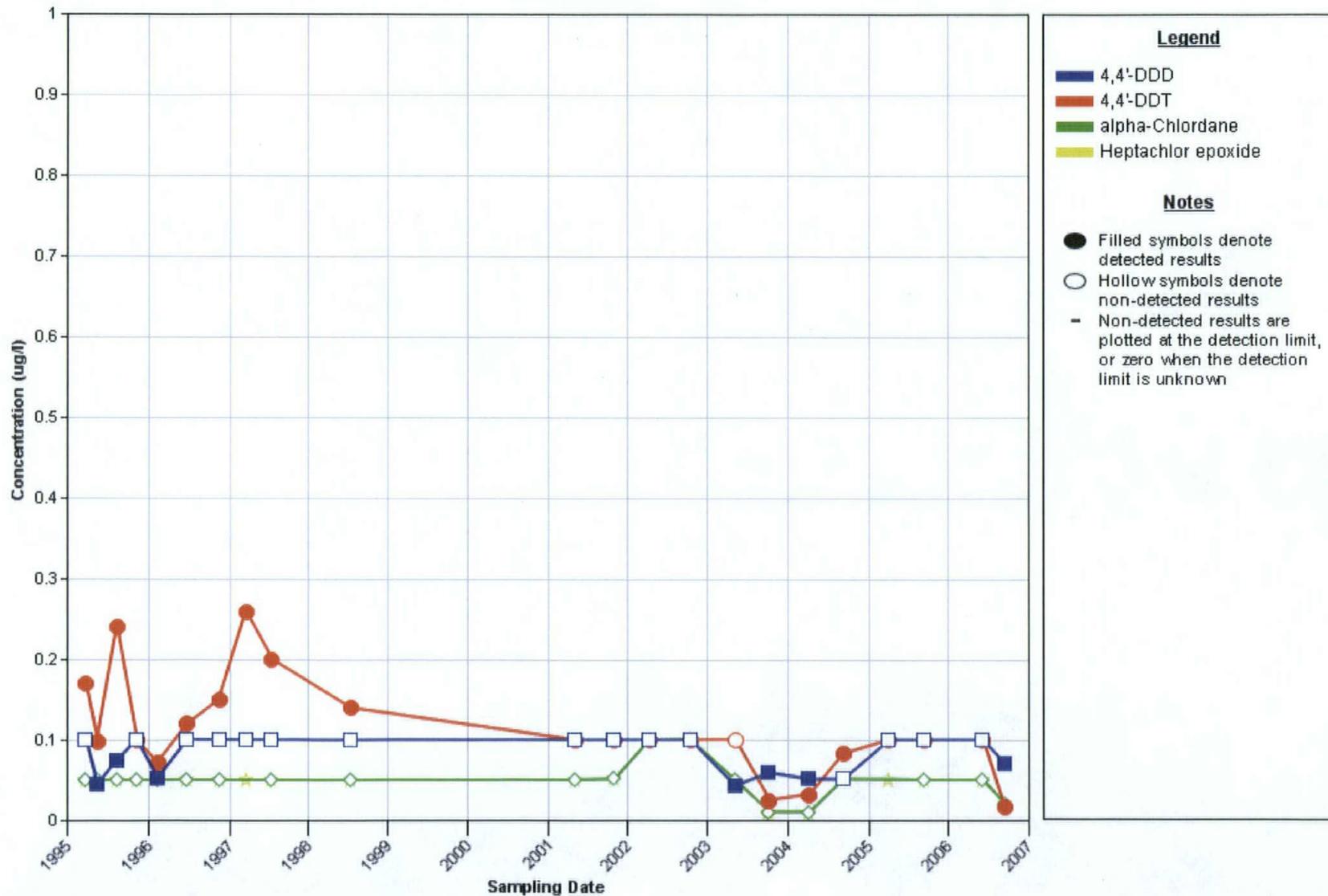


# MW-NASB-067

Pesticides

Low-flow Sample

Building 95 Ground Water

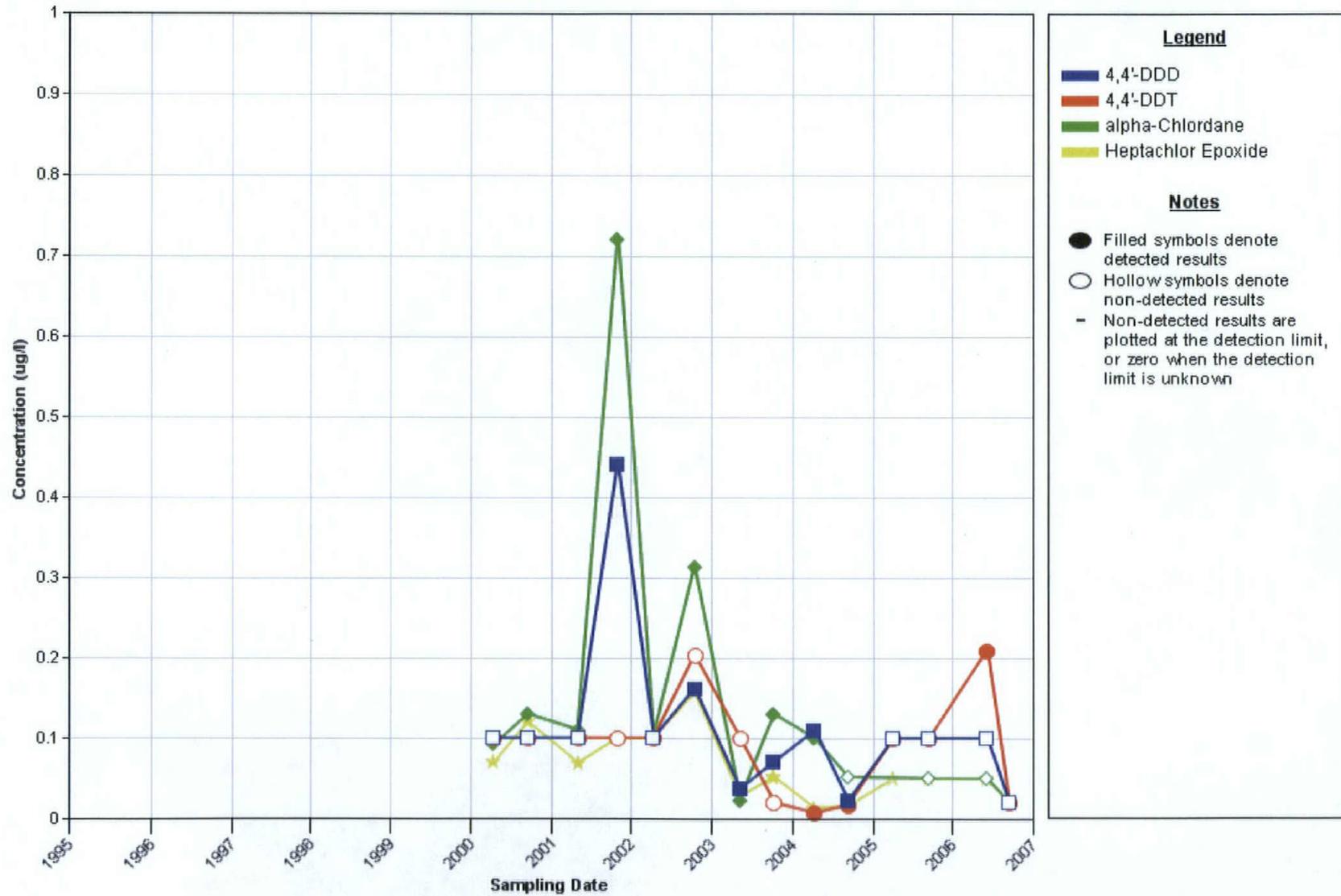


# MW-NASB-097

Pesticides

Low-flow Sample

Building 95 Ground Water

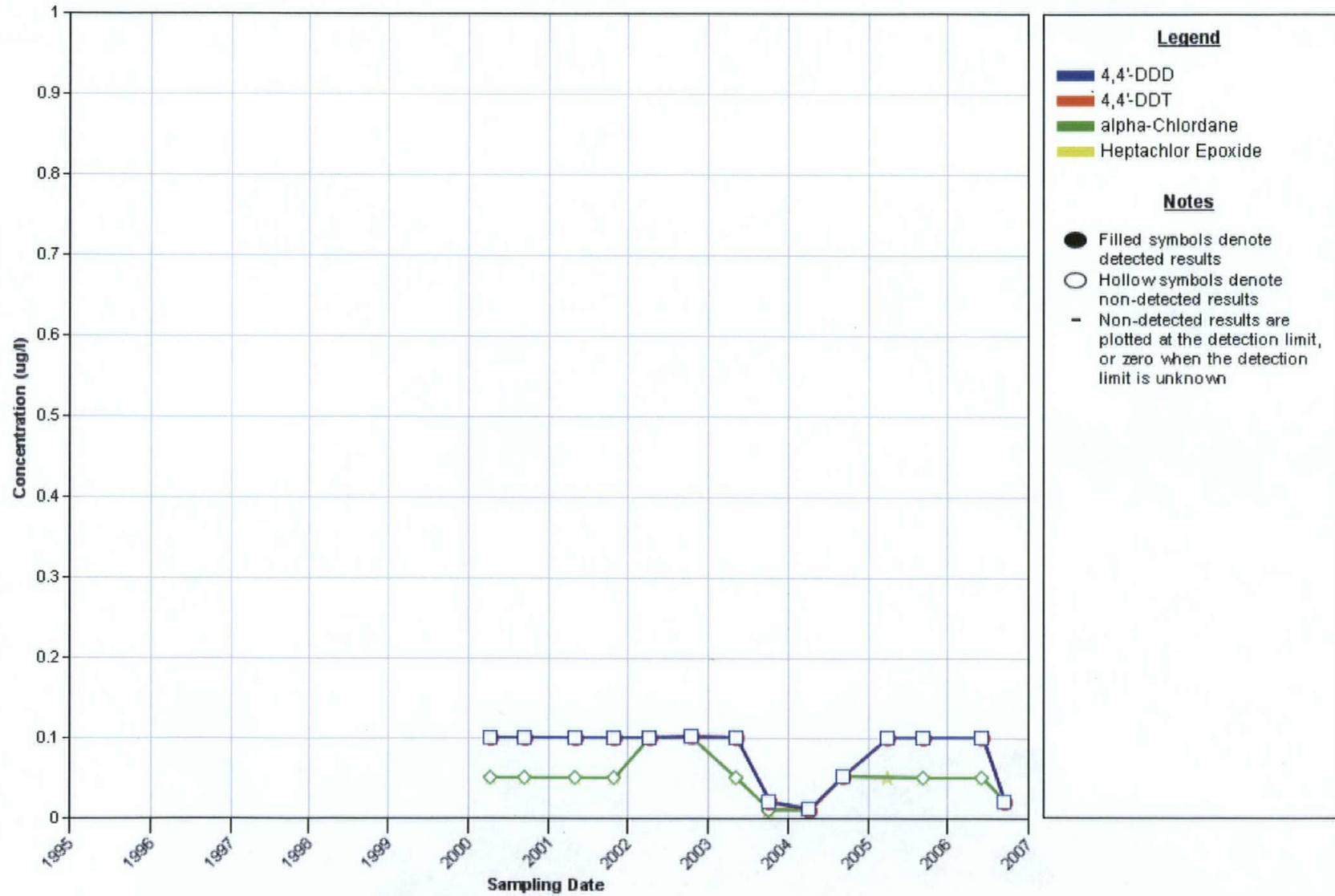


# MW-NASB-098

Pesticides

Low-flow Sample

Building 95 Ground Water



**Responses to Comments Provided by the State of Maine,  
Department of Environmental Protection on the  
Site 17 Monitoring Event 24 (September 2006) Draft Report, July 2007  
Naval Air Station, Brunswick, Maine**

Reviewer: Ms. Claudia Sait, MEDEP Project Manager  
Date: August 27, 2007  
Respondent: Navy  
Date: September 7, 2007

Comment #	Location	Comment	Response
1	General	The data overall are consistent with the past few years of monitoring, with low 4,4'-DDD and 4,4'-DDT detected at MW-NASB-67 in Monitoring Event (ME) 24 and with low 4,4'-DDD detected in MW-NASB-067 and low 4,4'-DDT detections in MW-NASB-097 reported in ME 25. None of these detections exceeded 0.1 ug/L. There are no indications of sampling or analytical issues that compromised the data. A summary of the site history through 2003 is included as an appendix, and is a useful addition. Improvements from past ME reports have been continued in the latest submittals.	<b>Noted.</b>
3	Table 1-2 and Table 3-1	The additional graphics and table entries are useful supporting information in the report, however the graphics for Table 3-1 need to have the x-axis dates converted to mm/dd/yy or some similar format.	<b>Concur.</b> The x-axis will have the dates converted to mm/dd/yy format.
4	Section 2.3	The text is missing the MEG for 4,4'-DDT of 1.0 µg/L. Please revise.	<b>Concur.</b> The text will include the MEG for 4,4'-DDT of 1.0 ug/l.
5	Section 3.1	The text in the first paragraph must be revised to reflect the 4,4'-DDD and 4,4'-DDT detections at MW-NASB-067 in the Fall 2006 round. MEDEP suggests the language in the second paragraph be revised as it is in the ME 25 report (Section 3.1, Bullet 1, third paragraph), which is a better description of the results and includes the low detections in ME 24.	<b>Concur.</b> The first paragraph will be revised to reflect the 4,4'-DDD and 4,4'-DDT detections at MW-NASB-067 in ME24.
6	Section 1.3 and Table 3-1	MEDEP notes that toxaphene, although not a site contaminant of concern, appears to have been eliminated from analyte list. Please provide the rationale for eliminating this analyte in the report or provide the data.	<b>Noted.</b> As provided for in the accepted Monitoring Event 22 response to Comment #2 (" <i>...Toxaphene will be removed from the laboratory reporting list, as it is not a historical LTMP COC</i> ") the Navy removed toxaphene from the analyte list. Toxaphene is not required in the Basewide QAPP (ECC/EA 2006) nor was it required in any of the past Site 17 LTMP analyte lists.

Comment #	Location	Comment	Response
7	Section 3.2	MEDEP cannot agree to entirely discontinuing the monitoring of groundwater at the site as long as buried waste remains at the site. However, MEDEP is open to discussing a reduction in monitoring, perhaps to sampling every other year. When the Remedial Investigation is completed then the required groundwater monitoring will be revisited, and further revisions to the LTMP are likely.	<b>Noted.</b> The future of Site 17 monitoring could be discussed during the September 2007 technical meeting.
8	Figures 1-2 and 1-3 and Table 1-1 and Table 1-2	Table 1-1 indicates that MW-NASB-209R and MW-NASB-210 are part of the long term monitoring as gauging locations, however they were not gauged in either ME2 4 or ME 25 or the data was not included in the reports. Figure 1-2 must be expanded to show the wells in both reports and future rounds must include the gauging of these wells. That data must be then be included in the appropriate tables and shown on Figure 1-2 and Figure 1-3 or their equivalent.	<b>Noted.</b> These wells were not gauged. As per the November 2004 LTMP for Site 17, MW-NASB-209R and MW-NASB-210 are not part of the Long-Term Monitoring Program. To reflect this, they will be removed from Table 1-1. However, historically these wells were gauged to provide additional data on local groundwater flow patterns. They will be gauged during the Fall 2007 sampling event. Their locations and data will be represented and reported in the Fall 2007 monitoring event report with the following footnote: "These wells are not part of the Site 17 Long-Term Monitoring Program but are gauged to provide additional data on local groundwater flow patterns."
<b>END OF COMMENTS</b>			

**Responses to Comments Provided by the United States Environmental Protection Agency  
New England – Region 1 on the  
Sites 17 Monitoring Event 24 (September 2006) Draft Report, July 2007  
Naval Air Station, Brunswick, Maine**

Reviewer: Ms. Christine Williams, EPA Project Manager  
Date: August 16, 2007  
Respondent: Navy  
Date: September 7, 2007

Comment #	Location	Comment	Response
1	General	Water-level gauging was conducted at six wells, as per the monitoring plan. The inferred equipotential surface (Fig. 1-3) indicates flow from NW to SE. Results are consistent with historical records. Groundwater sampling was carried out at three wells, as per the plan. Most pesticides were non-detect (ND), demonstrating that contamination is no longer detectable at these wells. 4,4'-DDD (0.071J ppb) and 4,4'-DDT (0.016J ppb) were detected at low concentrations at MW-NASB-067. (For comparison, the Maine MEG for 4,4'-DDT is 1 ppb.) Historical detections were found principally at MW-NASB-097; heptachlor epoxide and alpha chlordane were previously above their respective Maine MEGs	<b>Noted.</b>
2	General	It is agreed that the LTMP should be reviewed following planned additional characterization and soil removal (e.g., p. 3-2, sec. 3.2). However, monitoring coverage and frequency should not be reduced until any soil removal is completed, and several rounds under the current plan are completed, in order to verify that the removal has not (at least temporarily) mobilized groundwater contamination due to disturbed ground, open excavations, etc.	<b>Noted.</b> As mentioned in MEDEP comment #7, the future monitoring could be discussed at the next technical meeting.
3	Page 1-1, Section 1.3	Please note that the text refers the reader to Table 1-3 for the low-flow field parameters, while the table is labeled Table 3-1. Please edit for consistency	<b>Concur.</b> The text will be edited to read Table 3-1.
4	Page 1-1, Section 1.3	The historical trend plots for field parameters (Table 3-1) are welcome. This allows for a quick, visual assessment of whether or not any particular parameter from any particular round falls within its historical range, or is anomalous. It is noted in this regard that the ORP data (not shown graphically) from ME24 show significant departures from the historical averages. At MW-NASB-067, ORP was recorded at +335 mV, compared to a historical average of 77 mV. At MW-NASB-098, ORP was recorded at -9 mV, compared to a historical average of +87 mV. How do these apparent anomalies compare to their respective historical ranges?	<b>Noted.</b> The ORP data will be provided graphically so that comparisons can be made.

Comment #	Location	Comment	Response
5	Page 2-1, Section 2.2	The text refers the reader to Table 1-3 for the low-flow field parameters, while the table is labeled Table 3-1. Please edit for consistency.	<b>Concur.</b> The text will be edited to read Table 3-1.
6	Page 2-1, Section 2.3	The text states, "Pesticides results for all sampled Site 17 monitoring wells from Monitoring Event 21 (April 2005) through Monitoring Event 24 (September 2006) were non-detect. However, Table 1-4 indicates that 4,4'-DDD (0.071J ppb) and 4,4'-DDT (0.016J ppb) were detected at MW-NASB-067, albeit at low concentrations. Please edit for consistency.	<b>Concur.</b> The first paragraph will be revised to reflect the 4,4'-DDD and 4,4'-DDT detections at MW-NASB-067 in ME24.
7	Page 2-2, Section 2.3	The text refers to the MEG for 4,4'-DDT at "0.XX" micrograms per liter. It appears from Table 1-4 that the value is intended to be 1 microgram per liter. Please edit.	<b>Concur.</b> The text will include the MEG for 4,4'-DDT of 1.0 ug/l.
8	Page 3-1, Section 3.1	The text states, "No issues concerning integrity of the monitoring wells were identified." While it appears that the wells were in sufficiently good condition to yield good water-quality samples, sec. 1.5 (p. 1-2) notes that MW-NASB-097 had no label, no lock, and a broken road box. This might be repeated again here for completeness.	<b>Noted.</b>
9	Page 3-2, Section 3.2	Please see General Comment regarding discontinuation of groundwater monitoring at the site.	<b>Noted.</b>
<b>END OF COMMENTS</b>			

August 27, 2007

Mr. Orlando Monaco  
Department of Navy  
Base Realignment and Closure  
Program Management Office-Northeast  
4911 South Broad Street  
Philadelphia, PA 19112-1303

Re: Site 17 Monitoring Events 24 & 25  
Naval Air Station, Brunswick, Maine

Dear Mr. Monaco:

Pursuant to Section VI of the Naval Air Station, Brunswick, Maine Federal Facility Agreement (Oct 1990), as amended, the Maine Department of Environmental Protection (MEDEP) has reviewed the draft "Site 17 (Building 95) Monitoring Event 24 Report-September 2006" and the draft "Site 17 (Building 95) Monitoring Event 25 Report-April 2007", both dated July 2007, and prepared by Environmental Chemical Corporation. Based on that review MEDEP has the following comments and issues.

General Comments:

1. The data overall are consistent with the past few years of monitoring, with low 4,4'-DDD and 4,4'-DDT detected at MW-NASB-67 in Monitoring Event (ME) 24 and with low 4,4'-DDD detected in MW-NASB-067 and low 4,4'-DDT detections in MW-NASB-097 reported in ME 25. None of these detections exceeded 0.1 ug/L. There are no indications of sampling or analytical issues that compromised the data. A summary of the site history through 2003 is included as an appendix, and is a useful addition. Improvements from past ME reports have been continued in the latest submittals.
2. The appendices for ME 25 do not indicate the subject of the file. Please revise the CD appendices so that they have titles in addition to "Appendix X".

Specific Comments, Monitoring Event 24:

3. Table 1-2 and Table 3-1: The additional graphics and table entries are useful supporting information in the report, however the graphics for Table 3-1 need to have the x-axis dates converted to mm/dd/yy or some similar format.
4. Section 2.3, Analytical Results – MW-NASB-067: The text is missing the MEG for 4,4'-DDT of 1.0 ug/L. Please revise.

5. Section 3.1, LTMP Objective Bullet #1: The text in the first paragraph must be revised to reflect the 4,4'-DDD and 4,4'-DDT detections at MW-NASB-067 in the Fall 2006 round. MEDEP suggests the language in the second paragraph be revised as it is in the ME 25 report (Section 3.1, Bullet 1, third paragraph), which is a better description of the results and includes the low detections in ME 24.

ME 24 and ME 25:

6. Section 1.3 and Table 3-1: MEDEP notes that toxaphene, although not a site contaminant of concern, appears to have been eliminated from analyte list. Please provide the rationale for eliminating this analyte in the report or provide the data.
7. Section 3.2, Recommendations: MEDEP cannot agree to entirely discontinuing the monitoring of groundwater at the site as long as buried waste remains at the site. However, MEDEP is open to discussing ~~an~~ a reduction in monitoring, perhaps to sampling every other year. When the Remedial Investigation is completed then the required groundwater monitoring will be revisited, and further revisions to the LTMP are likely.
8. Figures 1-2 and 1-3, and Tables 1-1 and 1-2: Table 1-1 indicates that MW-NASB-209R and MW-NASB-210 are part of the long term monitoring as gauging locations, however they were not gauged in either ME 24 or ME 25 or the data was not included in the reports. Figure 1-2 must be expanded to show the wells in both reports and future rounds must include the gauging of these wells. That data must then be included in the appropriate tables and shown on Figure 1-2 and Figure 1-3 or their equivalent.

Please contact me at (207) 287-7713 or [claudia.b.sait@maine.gov](mailto:claudia.b.sait@maine.gov), if you have any questions or comments.

Respectfully,

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

Cf: File  
Chris Evans-MEDEP  
Dale Mosher-BNAS  
Christine Williams-EPA  
Carolyn Lepage-Lepage Environmental  
Al Easterday-ECC  
Ed Benedikt  
David Chipman (email only)  
Carol Warren-(email only)  
Catherine Guido-ECC (email only)  
Gina Calderone-ECC (email only)  
Neal Williams-ECC (email only)  
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