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NAS BRUNSWICK
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1998 Annual Report
Monitoring Event 10
Building 95
Naval Air Station, Brunswick, Maine

Contract No. N62472-92-D-1296
Contract Task Order No. 0047



Prepared for

Department of the Navy
Northern Division
Naval Facilities Engineering Command
10 Industrial Highway
Mail Stop No. 82
Lester, Pennsylvania 19113-2090

Prepared by

EA Engineering, Science, and Technology
The Maple Building
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Newburgh, New York 12550

August 1999
FINAL
296.0047

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Peter Nimmer

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Peter L. Nimmer, P.G.
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Charles R. Flynn, Jr., Ph.D., P.H.
Program Manager

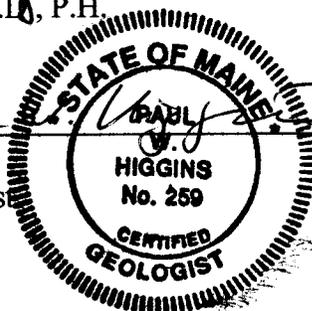
Date

Paul W. Higgins

8-17-99

Paul W. Higgins, C.G.
Maine-Certified Geologist

Date



August 1999
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QUALITY REVIEW STATEMENT

Contract No. N62472-92-D-1296

EA Project No.: 29600.47.7598

Contract Task Order No. 0047

Activity: Naval Air Station, Brunswick, Maine

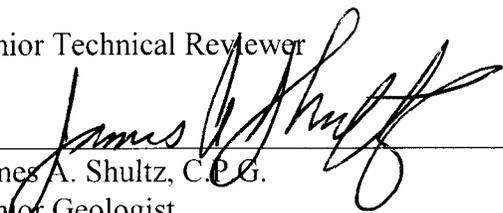
Description of Report/Deliverable:

1998 Annual Report, Monitoring Event 10, Building 95, Naval Air Station,
Brunswick, Maine

EA CTO Manager: Peter L. Nimmer, P.G.

In compliance with EA's Quality Procedures for review of deliverables outlined in the Quality Management Plan, this final deliverable has been reviewed for quality by the undersigned Senior Technical Reviewer(s). The information presented in this report/deliverable has been prepared in accordance with the approved Implementation Plan for the Contract Task Order (CTO) and reflects a proper presentation of the data and/or the conclusions drawn and/or the analyses or design completed during the conduct of the work. This statement is based upon the standards identified in the CTO and/or the standard of care existing at the time of preparation.

Senior Technical Reviewer


James A. Shultz, C.P.G.
Senior Geologist

17 August 1999
(Date)

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1. INTRODUCTION

1.1 BACKGROUND

Under Contract No. N62472-92-D-1296, Contract Task Order No. 0047, Northern Division, Naval Facilities Engineering Command contracted with EA Engineering, Science, and Technology to perform long-term monitoring at Building 95 at Naval Air Station (NAS), Brunswick, Maine. NAS Brunswick is located south of the Androscoggin River between Brunswick and Bath, Maine (Figure 1-1). Figure 1-2 provides the layout for the Building 95 site.

NAS Brunswick is an active base owned and operated by the Federal government through the Department of the Navy. In 1987, NAS Brunswick was placed on the National Priorities List by the U.S. Environmental Protection Agency (EPA) and is currently participating in the Navy's Installation Restoration Program. At the Building 95 site, the Navy is 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). A Long-Term Monitoring Plan (LTMP) (ABB-ES 1994a) was established pursuant to these Records of Decision. The LTMP for Building 95 is currently being revised and will be re-issued during 1999. The objective of the Long-Term Monitoring Program at Building 95 is to assess whether ground water has been impacted by past activities at this site.

This Annual Report documents the findings, conclusions, and recommendations based on the 1998 monitoring activities.

1.2 LONG-TERM MONITORING PROGRAM

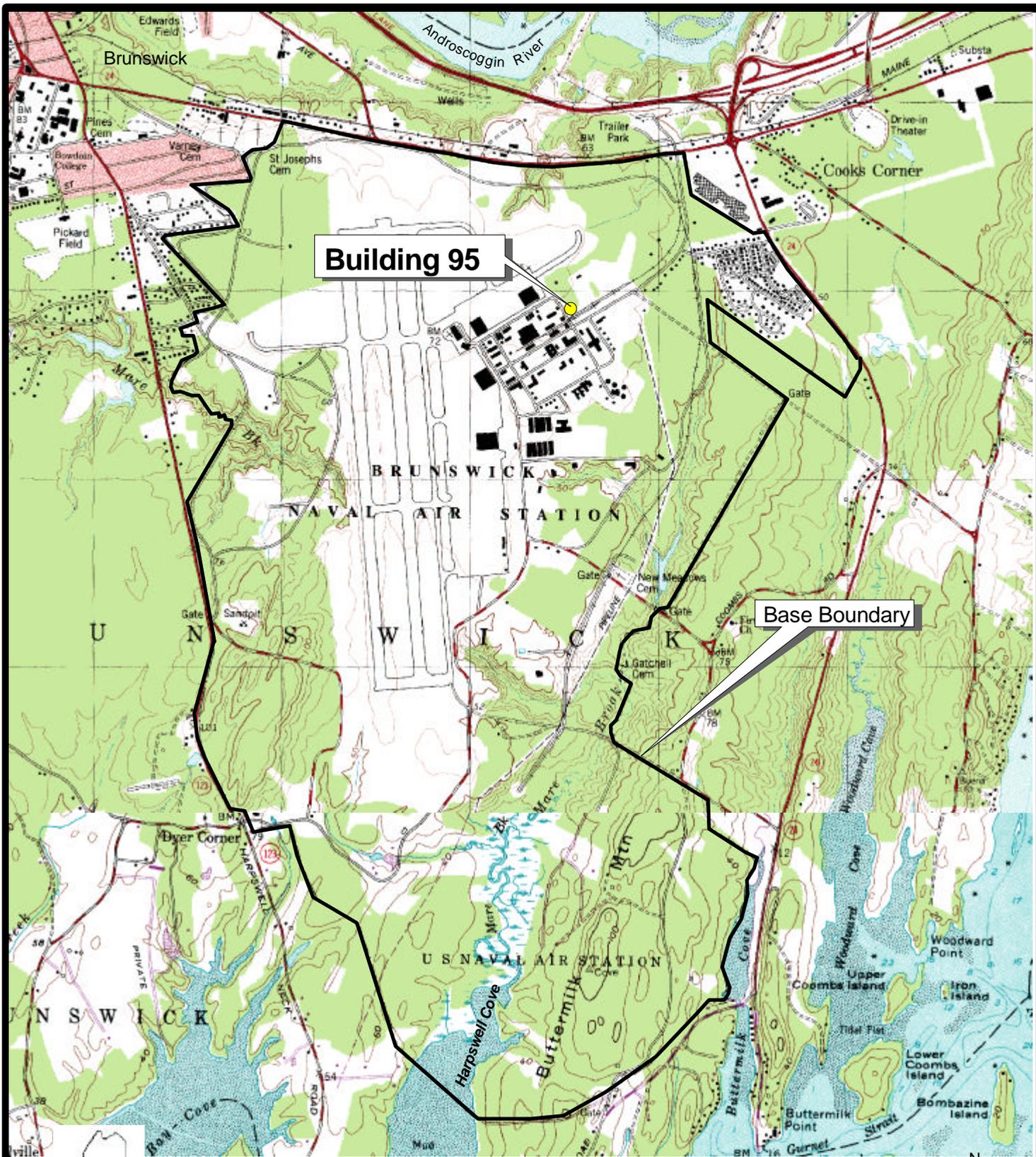
A summary of the Long-Term Monitoring Program for ground water at Building 95 is provided in Table 1-1.

Although not required by the LTMP, bi-monthly gauging of wells at Building 95 was performed during May, July, and September 1998 to investigate the potential for seasonal changes in ground-water flow patterns at the site. This will not be accomplished in 1999 as sufficient data have been gathered at this site previously.

1.3 ANNUAL REPORT ORGANIZATION

This annual report details the project activities conducted as part of the Long-Term Monitoring Program at the Building 95 site. This chapter provides an introduction and overview of the Long-Term Monitoring Program activities at the site. Chapter 2 briefly presents site background information and the site geology and hydrogeology. Chapter 3 presents results of the one monitoring event, three long-term monitoring gauging events, and three bi-monthly waterlevel

gauging events completed during 1998. Chapter 4 summarizes the results of the 1998 monitoring event and presents conclusions and recommendations based on these results. Graphs showing trends in analytical data results for pesticides, volatile organic compounds, and inorganic analytes are presented in Appendix A. Appendix B presents the response letters to comments received on the 1997 Annual Report and Monitoring Event 10 (August 1998) Report (EA 1998).



SOURCE MAPS: USGS ORRS ISLAND (1978) AND BRUNSWICK (1980) 7.5 MINUTE QUADRANGLES.



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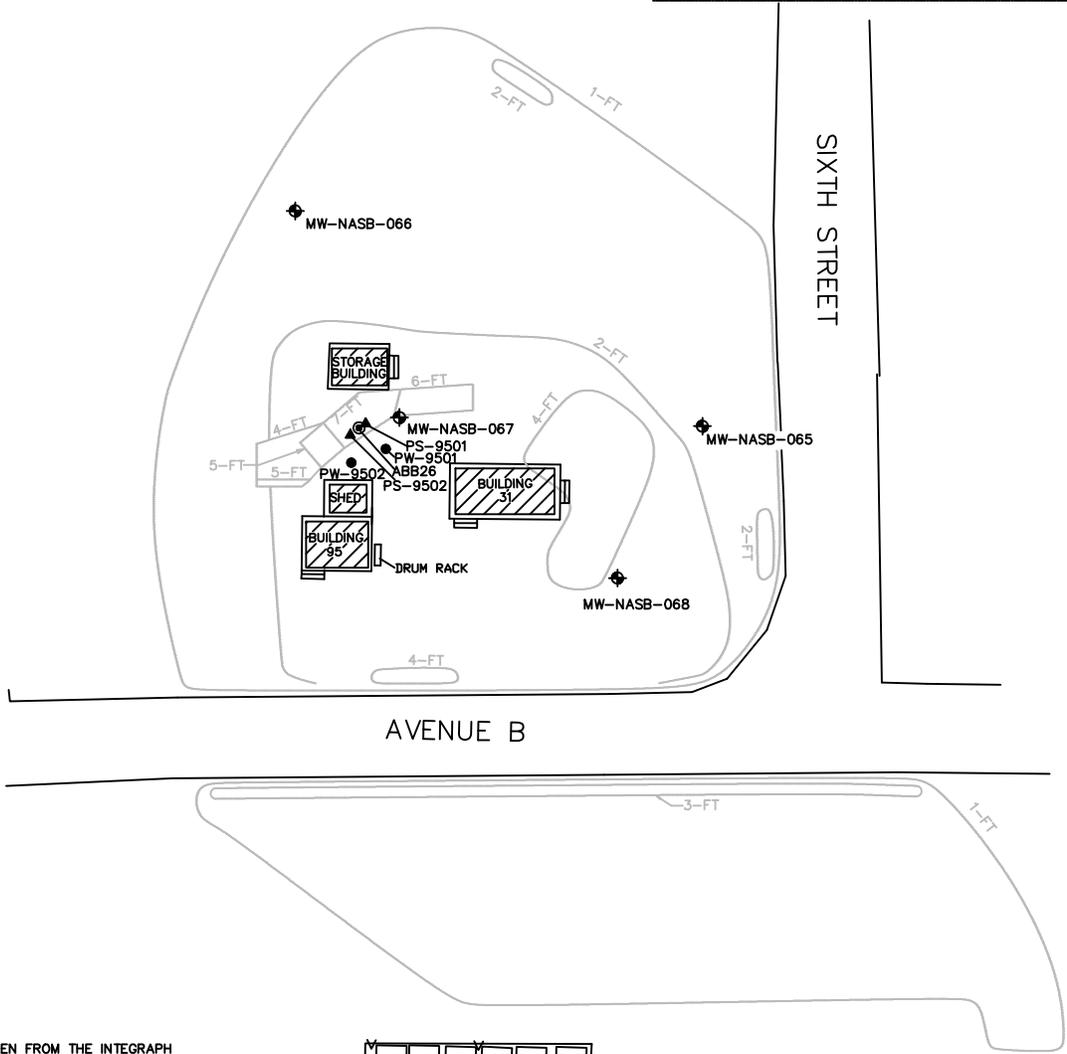
FIGURE 1 - 1
SITE LOCATION MAP,
BUILDING 95

PROJECT MGR PLN	DESIGNED BY BT	DRAWN BY BT	CHECKED BY PLN	SCALE AS SHOWN	DATE 16 AUGUST 1999	PROJECT No 29600.47	FILE No i:\nasb_gis navy.apr
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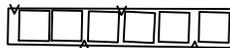
LEGEND

- 
MW-NASB-065
MONITORING WELL
- 
ABB26
CONFIRMATORY SOIL SAMPLE LOCATION ABOVE SOIL TO GROUNDWATER PATHWAY CRITERIA.
- 
CONFIRMATORY SOIL SAMPLING LOCATION
- 
CONFIRMATORY GROUNDWATER SAMPLING LOCATION
- 
FORMER BUILDINGS
- 
1-FT
APPROXIMATE SOIL EXCAVATION LIMITS (DEPTHS AS SHOWN IN FEET BELOW GRADE)

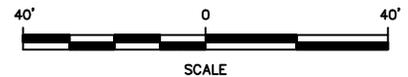


NOTE:

1. SITE PLAN TAKEN FROM THE INTEGRAPH VERSION 5 BASE-WIDE PLAN PROVIDED BY NAS BRUNSWICK PUBLIC WORKS DEPARTMENT ON 13 OCTOBER 1995.
2. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.
3. CONFIRMATORY SOIL SAMPLES (PS-9501 AND PS-9502) WERE COLLECTED 5-6 MAY 1998 BY HARDING LAWSON ASSOCIATES.
4. CONFIRMATORY GROUND-WATER SAMPLES (PW-9501 AND PW-9502) WERE COLLECTED 5-6 MAY 1998 BY HARDING LAWSON ASSOCIATES.



ELECTRIC TRANSFORMER



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BUILDING 95
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 1-2
SITE PLAN

PROJECT MGR CEM	DESIGNED BY SYC	DRAWN BY SAP	CHECKED BY PLN	SCALE AS SHOWN	DATE 5 APR 1999	PROJECT NO 29600.47	FILE No. SITEPLAN
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**TABLE 1-1 SUMMARY OF 1998 LONG-TERM MONITORING PROGRAM AT
BUILDING 95, NAVAL AIR STATION, BRUNSWICK, MAINE**

Sample Location	Sampling Date	Sample Analytical Parameters					
		TCL VOC	TCL SVOC	TCL Pesticides	Rotenone/Pyrethrins	TAL Elements	Field Parameters ^(a)
MW-NASB-065	August	X	X	X	X	X	X
MW-NASB-066	August	X	X	X	X	X	X
MW-NASB-067	August	X	X	X	X	X	X
MW-NASB-068	August	X	X	X	X	X	X
<p>(a) Determination of field parameters in accordance with EPA/600/4-79-020 using the following methods: pH (method 150.1), temperature (Method 170.1), specific conductance (Method 180.1), dissolved oxygen (Method 360.1), and Eh. Includes water level measurement.</p> <p>NOTE: TCL = Target Compound List. VOC = Volatile organic compounds by EPA Method 8260. SVOC = Semivolatile organic compounds by EPA Method 8270. Pesticides = Organochloride pesticides by EPA Method 8081. Rotenone/Pyrethrins = EPA Method 8310. TAL = Target Analyte List by EPA Method 6010/7470.</p>							

2. SITE BACKGROUND

2.1 SITE DESCRIPTION

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 the site is currently 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, low concentrations of pesticides and inorganics were reported in ground-water samples (ABB-ES 1993, 1994b).

Corrective measures were taken at the site following completion of a baseline risk assessment. Remedial measures included excavation of the upper 1-7 ft of soil in the area of concern (Figure 1-2), placement of a permeable geotextile liner at the bottom of the excavation to act as a marker of the excavation, and backfilling with clean fill. One confirmatory soil sample (ABB26) reported concentrations of DDT above soil to ground-water pathway criteria (ABB-ES 1997). The extent and depth of the excavated area is shown on Figure 1-2. As part of the Long-Term Monitoring Program, sampling of the 4 existing monitoring wells is conducted to establish whether any residual pesticide material is affecting ground-water quality. Due to the low reported detections of chemicals of concern at this site, it was agreed that the sampling frequency be reduced from quarterly to tri-annual sampling. A further reduction was agreed to following Monitoring Event 8 (March 1997), and Monitoring Event 9 (August 1997) represented the initiation of annual sampling.

2.2 GEOLOGY/HYDROGEOLOGY

The geology in the vicinity of the Building 95 site consists of well sorted sand and silty clay units. Generally, the glacio-marine clay underlies the sand unit and has been reported to be approximately 8-ft thick. The depth to bedrock at the site has not been determined. Four monitoring wells (MW-NASB-065, MW-NASB-066, MW-NASB-067, and MW-NASB-068) were installed at the site in 1993 to monitor ground-water quality as part of the Long-Term Monitoring Program. The screened intervals of site monitoring wells range from 5 to 15 ft below surface grade. The water table has generally been present at approximately 5 ft below surface grade. Ground-water flow is generally toward the south-southeast. Additional site geology information and past activities are summarized in the Action Memorandum (ABB-ES 1993).

3. LONG-TERM MONITORING PROGRAM—1998

3.1 WATER LEVEL GAUGING PROGRAM

Depth to ground-water measurements were obtained (gauged) in the 4 ground-water monitoring wells located at the Building 95 site during the three long-term monitoring gauging events (March, July, and November 1998). Although not required by the LTMP, three bi-monthly water level gauging events were also conducted during January, May, and September 1998 to identify seasonal fluctuations in water table elevations and ground-water flow direction.

Water level data were collected during the August 1998 monitoring event and three bi-monthly monitoring events to assess ground-water flow direction and hydraulic gradient at the Building 95 site.

Interpretive water table elevation maps were developed from the data collected at Building 95. Figures 3-1 through 3-7 provide the interpreted water table contour elevation maps for the gauging events completed during 1998 (6 January, 2 March, 6 May, 1 July, 4 August, 1 September, and 2 November).

3.2 GROUND-WATER MONITORING AND SAMPLING PROGRAM

Ground-water samples were obtained during Monitoring Event 10 (August 1998) from the 4 monitoring wells located at the Building 95 site. Ground-water samples were collected in accordance with procedures specified in the LTMP (ABB-ES 1994a) using dedicated submersible pumps. The low-flow sampling method was used because it minimizes turbidity in ground-water samples. A detailed discussion of the low-flow sampling technique, including dedicated pump system installation, is provided as Appendix A of the March 1995 monitoring event report (EA 1995).

Table 1-1 summarizes the analytical program for ground-water samples collected at the Building 95 site. A summary of the analytical results for ground-water samples collected during Monitoring Event 10 is provided in Table 3-1. Graphs showing analytical result trends for pesticides, total volatile organic compounds, and inorganic analytes for Monitoring Events 1 through 10 are presented in Appendix A.

3.3 VISUAL INSPECTION

Site inspection activities were completed during March, July, and November. Site inspection activities included the following tasks:

- Inspection of the site area for evidence of stressed vegetation
- Inspection of the site area for potential surface exposure of the geotextile liner system
- Inspection of the 4 site monitoring wells.

3.4 SUMMARY OF FINDINGS OF SOIL AND GROUND-WATER CONFIRMATORY SAMPLING

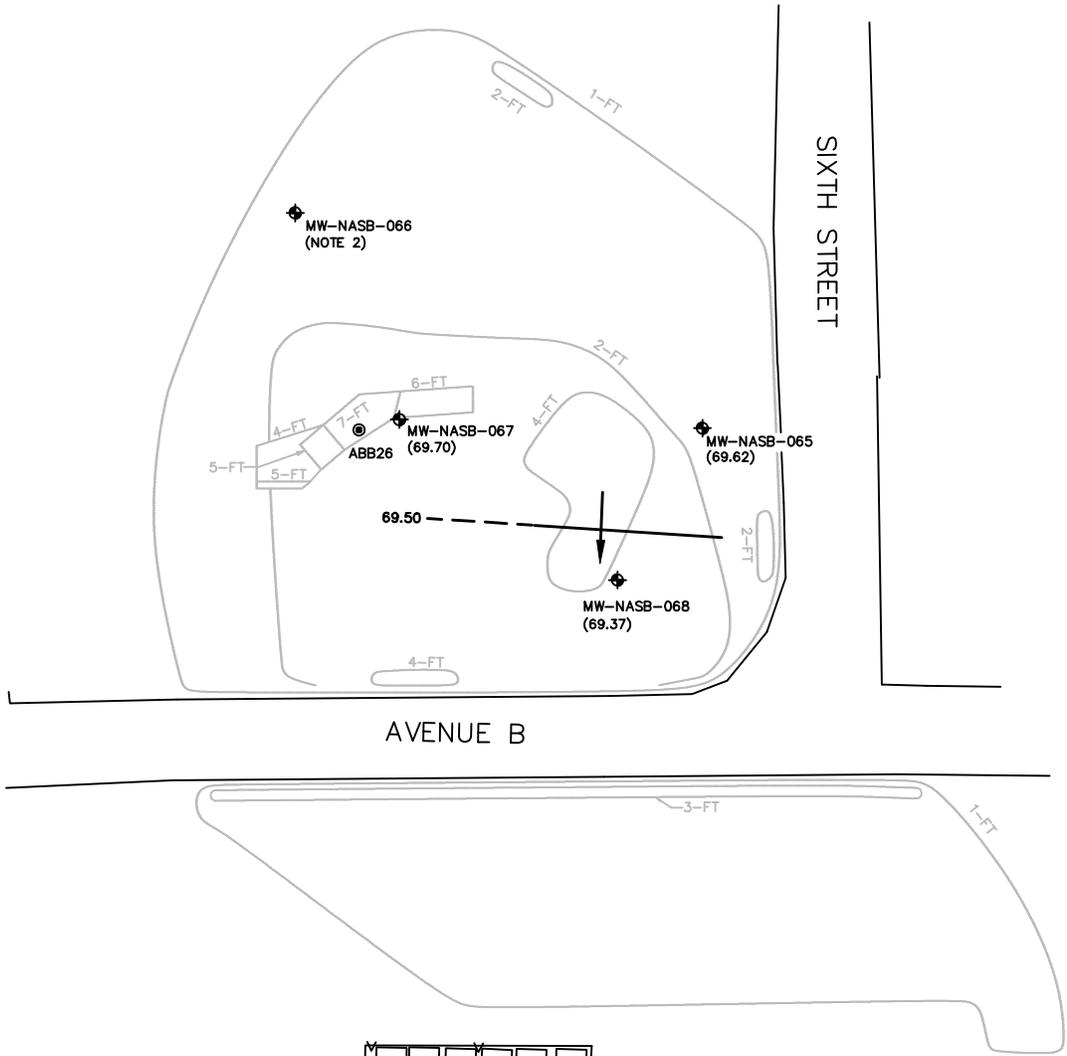
An investigation was conducted in 1998 outside of the Long-Term Monitoring Program to investigate soil and ground-water concentrations of DDT at Building 95. On 5-6 May 1998, Harding Lawson Associates (formerly ABB Environmental Services, Inc.) conducted confirmatory soil and ground-water sampling at the Building 95 site. A discrepancy between field and offsite laboratory results for one of the confirmation samples collected in 1994 during a previous removal action caused some uncertainty as to whether preliminary remediation goals were fully attained. The preliminary remediation goal established at the Building 95 site for deep soils was 135,000 F g/kg of DDT (HLA 1998). MEDEP requested additional soil samples at that location and additional ground-water samples in the area immediately downgradient of the confirmation sampling point in question.

Two probe borings were completed to collect soil samples and two borings were completed to collect ground-water samples (Figure 1-2). Soil samples were analyzed for Target Compound List DDT and ground-water samples were analyzed for Target Compound List pesticides by EPA SW 846 Method 8081 by Katahdin Analytical Laboratory in Westbrook, Maine.

Results of the soil sampling showed that soil concentrations of 4,4-DDT (180F g/kg and 430 mg/kg) were several orders of magnitude below the preliminary remediation goal that was established for the removal action. The conclusions of the HLA report note that ground-water sampling showed no impact to ground water (HLA 1998).

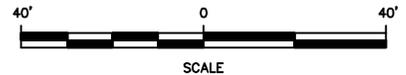
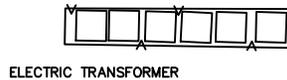


LEGEND		
	MW-NASB-065 (69.62)	MONITORING WELL (WATER TABLE ELEVATION, FT. MSL.)
	ABB26	CONFIRMATORY SOIL SAMPLE LOCATION ABOVE SOIL TO GROUND-WATER PATHWAY CRITERIA.
		INTERPRETED DIRECTION OF GROUND-WATER FLOW
	69.50	INTERPRETED POTENTIOMETRIC SURFACE; CONTOUR INTERVAL = 0.25 FT
		APPROXIMATE SOIL EXCAVATION LIMITS (DEPTHS AS SHOWN IN FEET BELOW GRADE)



NOTE:

1. A TOTAL OF 0.15 INCHES OF PRECIPITATION WAS OBSERVED 1 WEEK BEFORE AND DURING GAUGING EVENT.
2. ANOMALOUS GROUNDWATER ELEVATION NOTED. NOT USED IN CONTOUR MAP GENERATION.
3. INTERPRETED CONTOURS SHOWN REPRESENT EVALUATION OF CONDITIONS BASED ON AVAILABLE DATA. SOME VARIATION MUST BE EXPECTED.
4. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.



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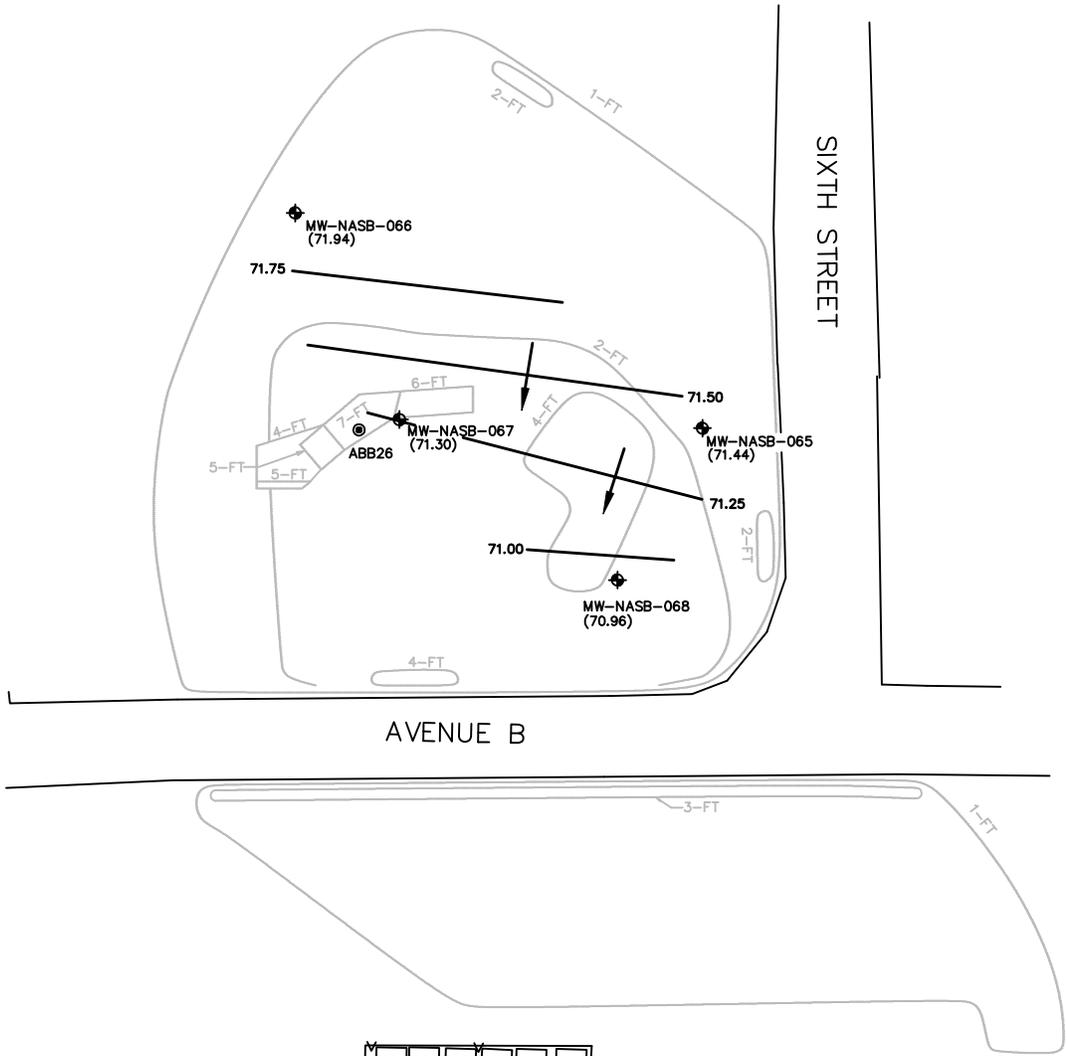
BUILDING 95
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 3-1
INTERPRETED WATER TABLE
ELEVATIONS, 6 JANUARY 1998

PROJECT MGR CEM	DESIGNED BY SYC	DRAWN BY SAP	CHECKED BY PLN	SCALE AS SHOWN	DATE 5 APR 1999	PROJECT NO 29600.47	FILE No. B95JAN98
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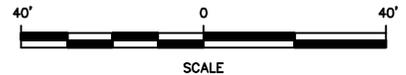
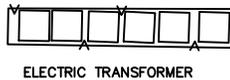


LEGEND		
	MW-NASB-065 (71.44)	MONITORING WELL (WATER TABLE ELEVATION, FT. MSL.)
	ABB26	CONFIRMATORY SOIL SAMPLE LOCATION ABOVE SOIL TO GROUND-WATER PATHWAY CRITERIA
		INTERPRETED DIRECTION OF GROUND-WATER FLOW
	71.75	INTERPRETED POTENTIOMETRIC SURFACE; CONTOUR INTERVAL = 0.25 FT
		APPROXIMATE SOIL EXCAVATION LIMITS (DEPTHS AS SHOWN IN FEET BELOW GRADE)



NOTE:

1. A TOTAL OF 1.73 INCHES OF PRECIPITATION WAS OBSERVED 1 WEEK BEFORE AND DURING GAUGING EVENT.
2. INTERPRETED CONTOURS SHOWN REPRESENT EVALUATION OF CONDITIONS BASED ON AVAILABLE DATA. SOME VARIATION MUST BE EXPECTED.
3. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.



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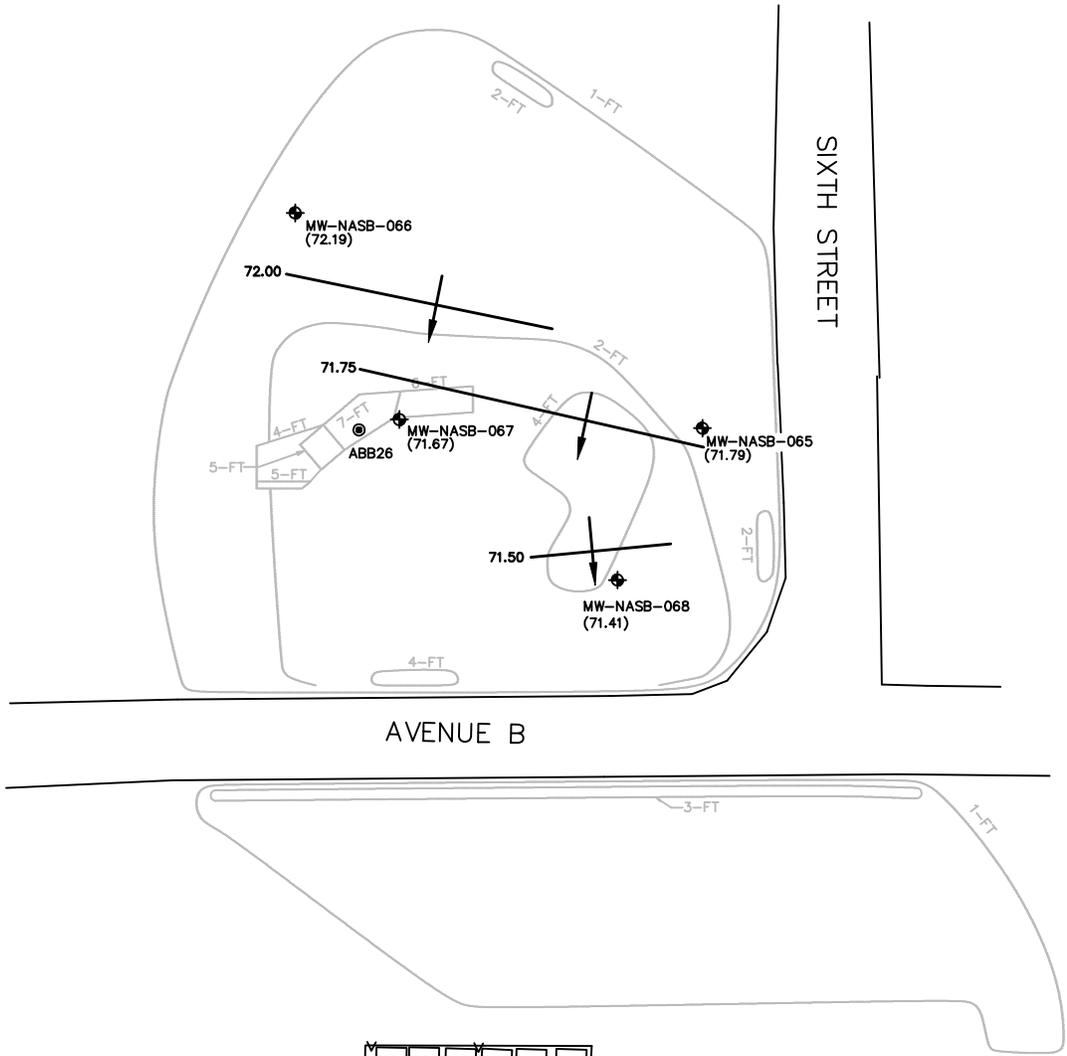
BUILDING 95
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 3-2
INTERPRETED WATER TABLE
ELEVATIONS, 2 MARCH 1998

PROJECT MGR CEM	DESIGNED BY SYC	DRAWN BY SAP	CHECKED BY PLN	SCALE AS SHOWN	DATE 5 APR 1999	PROJECT NO 29600.47	FILE No. B95MAR98
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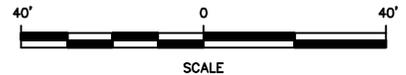
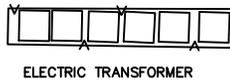


LEGEND		
	MW-NASB-065 (71.79)	MONITORING WELL (WATER TABLE ELEVATION, FT. MSL.)
	ABB26	CONFIRMATORY SOIL SAMPLE LOCATION ABOVE SOIL TO GROUND-WATER PATHWAY CRITERIA
		INTERPRETED DIRECTION OF GROUND-WATER FLOW
	71.75	INTERPRETED POTENTIOMETRIC SURFACE; CONTOUR INTERVAL = 0.25 FT
		APPROXIMATE SOIL EXCAVATION LIMITS (DEPTHS AS SHOWN IN FEET BELOW GRADE)



NOTE:

1. A TOTAL OF 2.81 INCHES OF PRECIPITATION WAS OBSERVED 1 WEEK BEFORE AND DURING GAUGING EVENT.
2. INTERPRETED CONTOURS SHOWN REPRESENT EVALUATION OF CONDITIONS BASED ON AVAILABLE DATA. SOME VARIATION MUST BE EXPECTED.
3. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.

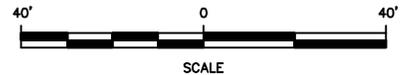
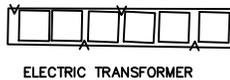
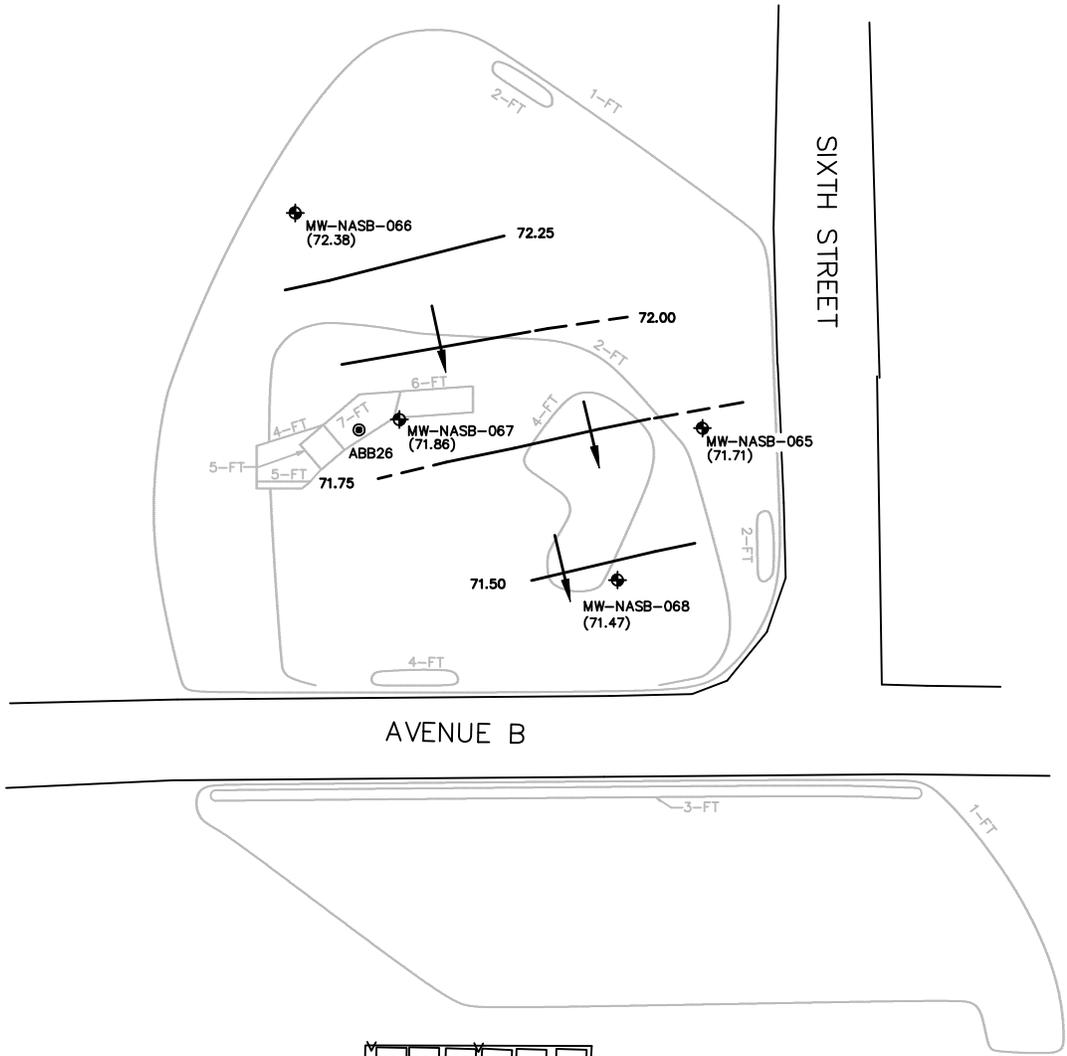


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		BUILDING 95 NAVAL AIR STATION BRUNSWICK, MAINE			FIGURE 3-3 INTERPRETED WATER TABLE ELEVATIONS, 6 MAY 1998		
PROJECT MGR CEM	DESIGNED BY SYC	DRAWN BY SAP	CHECKED BY PLN	SCALE AS SHOWN	DATE 5 APR 1999	PROJECT NO 29600.47	FILE No. B95MAY98



LEGEND	
	MONITORING WELL (WATER TABLE ELEVATION, FT. MSL.)
	MW-NASB-065 (71.71)
	CONFIRMATORY SOIL SAMPLE LOCATION ABOVE SOIL TO GROUND-WATER PATHWAY CRITERIA.
	ABB26
	INTERPRETED DIRECTION OF GROUND-WATER FLOW
	71.50 INTERPRETED POTENTIOMETRIC SURFACE; CONTOUR INTERVAL = 0.25 FT
	APPROXIMATE SOIL EXCAVATION LIMITS (DEPTHS AS SHOWN IN FEET BELOW GRADE)



NOTE:

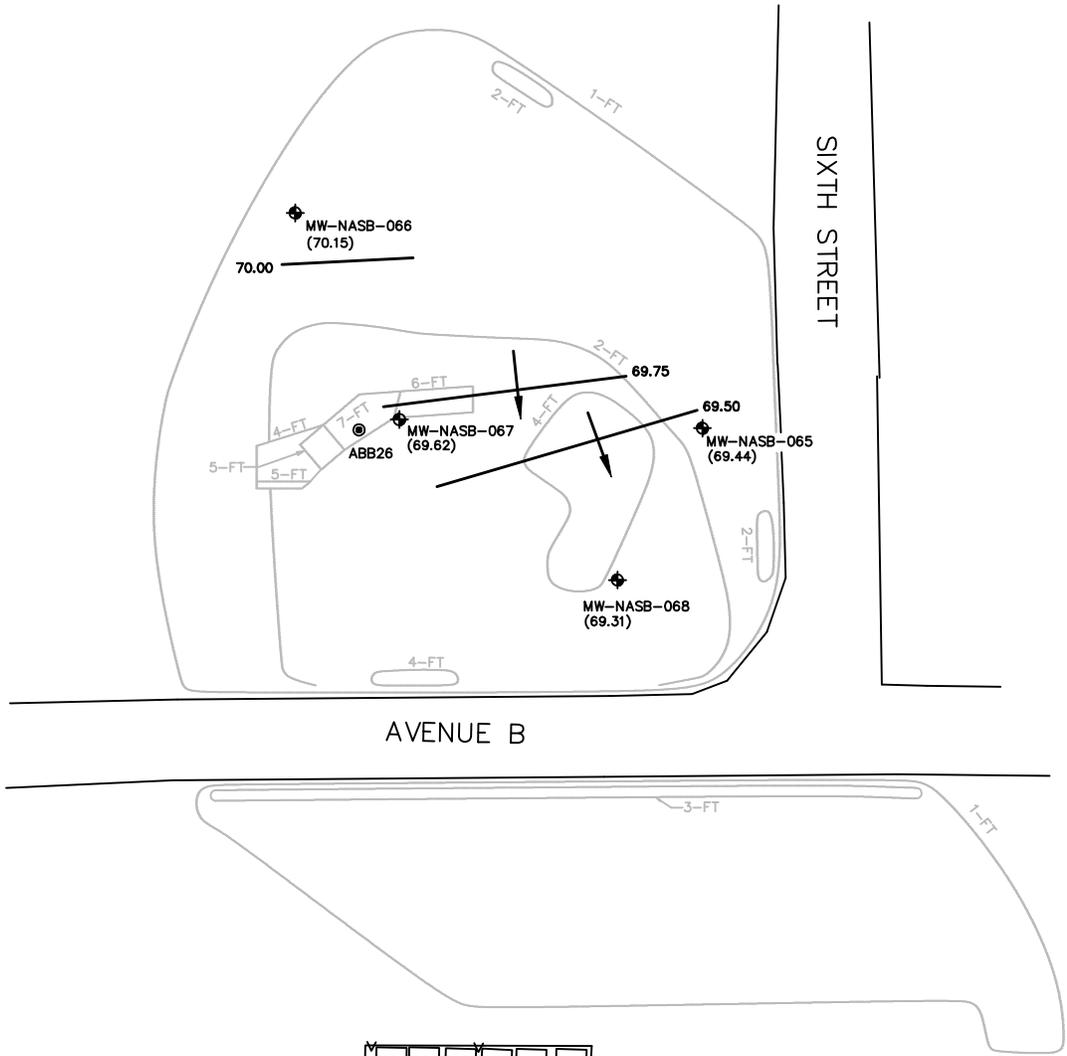
1. A TOTAL OF 1.26 INCHES OF PRECIPITATION WAS OBSERVED 1 WEEK BEFORE AND DURING GAUGING EVENT.
2. INTERPRETED CONTOURS SHOWN REPRESENT EVALUATION OF CONDITIONS BASED ON AVAILABLE DATA. SOME VARIATION MUST BE EXPECTED.
3. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.

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		BUILDING 95 NAVAL AIR STATION BRUNSWICK, MAINE			FIGURE 3-4 INTERPRETED WATER TABLE ELEVATIONS, 1 JULY 1998		
PROJECT MGR CEM	DESIGNED BY SYC	DRAWN BY SAP	CHECKED BY PLN	SCALE AS SHOWN	DATE 5 APR 1999	PROJECT NO 29600.47	FILE No. B95JUL98

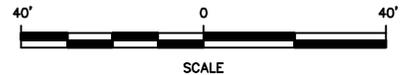
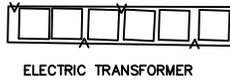


LEGEND		
	MW-NASB-065 (69.44)	MONITORING WELL (WATER TABLE ELEVATION, FT. MSL.)
	ABB26	CONFIRMATORY SOIL SAMPLE LOCATION ABOVE SOIL TO GROUND-WATER PATHWAY CRITERIA
		INTERPRETED DIRECTION OF GROUND-WATER FLOW
	70.00	INTERPRETED POTENTIOMETRIC SURFACE; CONTOUR INTERVAL = 0.25 FT
		APPROXIMATE SOIL EXCAVATION LIMITS (DEPTHS AS SHOWN IN FEET BELOW GRADE)



NOTE:

1. A TOTAL OF 0.30 INCHES OF PRECIPITATION WAS OBSERVED 1 WEEK BEFORE AND DURING GAUGING EVENT.
2. INTERPRETED CONTOURS SHOWN REPRESENT EVALUATION OF CONDITIONS BASED ON AVAILABLE DATA. SOME VARIATION MUST BE EXPECTED.
3. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.

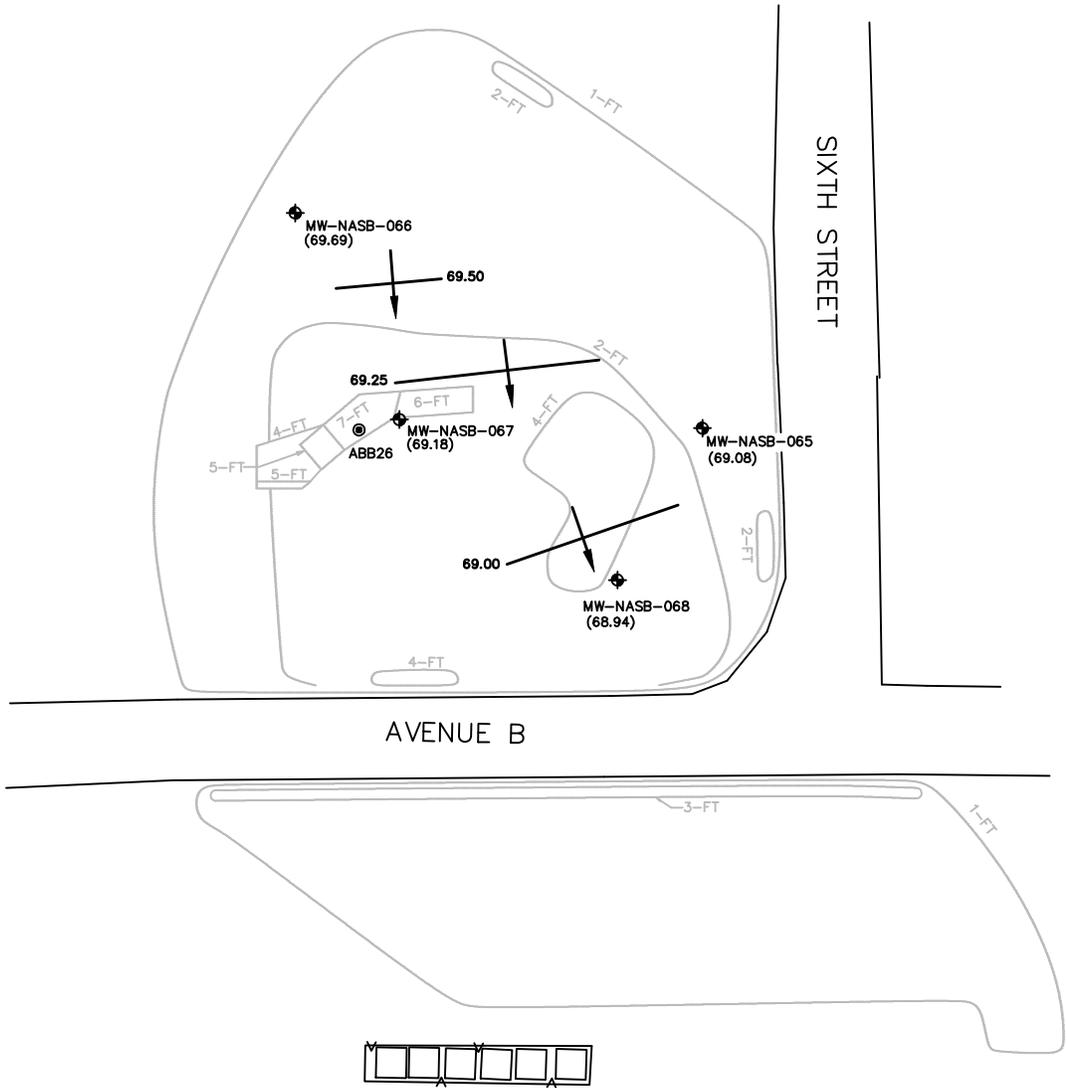


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		BUILDING 95 NAVAL AIR STATION BRUNSWICK, MAINE			FIGURE 3-5 INTERPRETED WATER TABLE ELEVATIONS, 4 AUGUST 1998		
PROJECT MGR CEM	DESIGNED BY SYC	DRAWN BY SAP	CHECKED BY PLN	SCALE AS SHOWN	DATE 5 APR 1999	PROJECT NO 29600.47	FILE No. B95AUG98

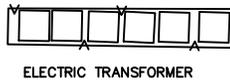


LEGEND	
	MW-NASB-065 (69.08) MONITORING WELL (WATER TABLE ELEVATION, FT. MSL.)
	ABB26 CONFIRMATORY SOIL SAMPLE LOCATION ABOVE SOIL TO GROUND-WATER PATHWAY CRITERIA
	INTERPRETED DIRECTION OF GROUND-WATER FLOW
	69.50 INTERPRETED POTENTIOMETRIC SURFACE; CONTOUR INTERVAL = 0.25 FT
	APPROXIMATE SOIL EXCAVATION LIMITS (DEPTHS AS SHOWN IN FEET BELOW GRADE)



NOTE:

1. A TOTAL OF 0.02 INCHES OF PRECIPITATION WAS OBSERVED 1 WEEK BEFORE AND DURING GAUGING EVENT.
2. INTERPRETED CONTOURS SHOWN REPRESENT EVALUATION CONDITIONS BASED ON AVAILABLE DATA. SOME VARIATION MUST BE EXPECTED.
3. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.

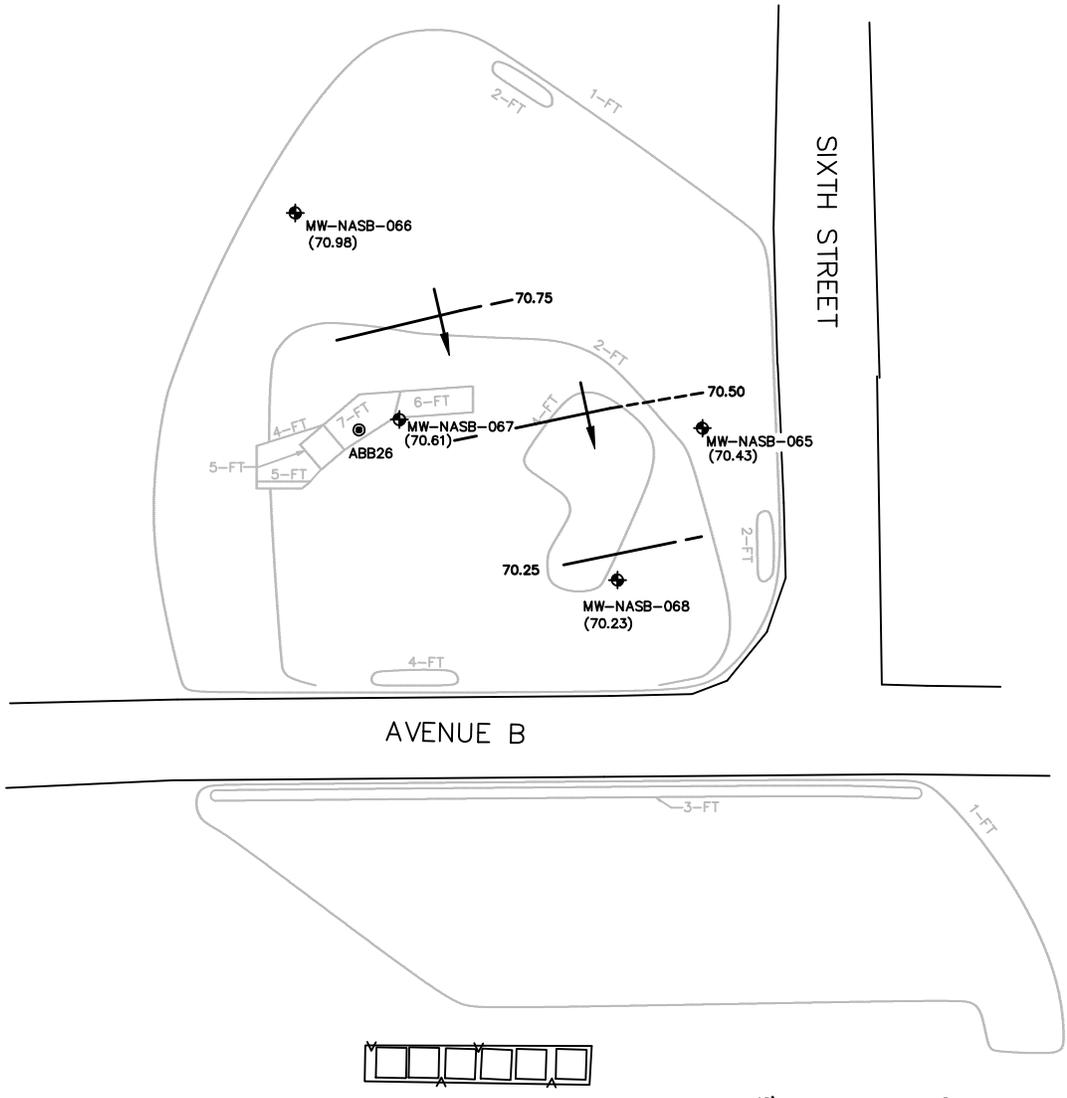


F:\CAD\29600\47\ANNUAL\BLD95\1998\B95SEP98.DWG

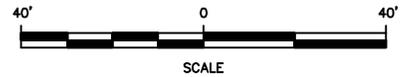
		BUILDING 95 NAVAL AIR STATION BRUNSWICK, MAINE			FIGURE 3-6 INTERPRETED WATER TABLE ELEVATIONS, 1 SEPTEMBER 1998		
PROJECT MGR CEM	DESIGNED BY SYC	DRAWN BY SAP	CHECKED BY PLN	SCALE AS SHOWN	DATE 5 APR 1999	PROJECT NO 29600.47	FILE No. B95SEP98



LEGEND		
	MW-NASB-065 (70.43)	MONITORING WELL (WATER TABLE ELEVATION, FT. MSL.)
	ABB26	CONFIRMATORY SOIL SAMPLE LOCATION ABOVE SOIL TO GROUND-WATER PATHWAY CRITERIA
		INTERPRETED DIRECTION OF GROUND-WATER FLOW
	70.75	INTERPRETED POTENTIOMETRIC SURFACE; CONTOUR INTERVAL = 0.25 FT
		APPROXIMATE SOIL EXCAVATION LIMITS (DEPTHS AS SHOWN IN FEET BELOW GRADE)



- NOTE:**
1. A TOTAL OF 0.66 INCHES OF PRECIPITATION WAS OBSERVED 1 WEEK BEFORE AND DURING GAUGING EVENT.
 2. INTERPRETED CONTOURS SHOWN REPRESENT EVALUATION OF CONDITIONS BASED ON AVAILABLE DATA. SOME VARIATION MUST BE EXPECTED.
 3. THE CONTOURS SHOWING EXCAVATION DEPTHS FROM ABB-ES 1997.



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		BUILDING 95 NAVAL AIR STATION BRUNSWICK, MAINE			FIGURE 3-7 INTERPRETED WATER TABLE ELEVATIONS, 2 NOVEMBER 1998		
PROJECT MGR CEM	DESIGNED BY SYC	DRAWN BY SAP	CHECKED BY PLN	SCALE AS SHOWN	DATE 5 APR 1999	PROJECT NO 29600.47	FILE No. B95NOV98

TABLE 3-1 SUMMARY OF ANALYTICAL RESULTS FOR GROUND-WATER
 SAMPLES COLLECTED DURING MONITORING EVENT 10, BUILDING 95
 NAVAL AIR STATION, BRUNSWICK, MAINE

Compound/Analyte	Monitoring Event 10 AUG 1998	MEG ^(a)	MCL ^(b)
MW-NASB-065			
VOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8260 (F g/L)			
Ethylbenzene	0.6J	700	700
Xylenes, total	0.8J	600	10,000
SEMIVOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8270 (F g/L)			
NONE DETECTED			
PESTICIDES BY EPA METHOD 8080 (F g/L)			
4,4'-DDT	(<0.10U)	0.83	---
4,4'-DDD	(<0.10U)	---	---
TOTAL PYRETHRINS AND ROTENONE BY MODIFIED EPA METHOD 8310 (F g/L)			
Total Pyrethrins	(<17U)	---	---
Rotenone	(<1.4U)	4	---
TARGET ANALYTE LIST METALS BY SW-846 6000/7000/9000 SERIES METHODS (F g/L)			
Aluminum	287	1,430	50-200 ^(c)
Antimony	1.8B*	---	6
Barium	12.7B*	1,500	2,000
Calcium	12,600	---	---
Chromium	(<4.0U)	100	100
Copper	(<2.0U)	---	1,300 ^(d)
Iron	6,360	---	300 ^(c)
Lead	(<1.0U)	20	15 ^(d)
Magnesium	1,490	---	---
Manganese	474	200	50 ^(c)
Mercury	(<0.10U)	2	2
Potassium	2,330	---	---
Sodium	10,100	---	---
Thallium	(<1U)	0.4	2
Zinc	(<12.0U)	---	5,000 ^(c)
<p>(a) MEG (Maximum Exposure Guideline) obtained from State of Maine Department of Human Services Revised Maximum Exposure Guideline, memorandum dated 23 October 1992. Dashes (---) indicate no MEG applicable.</p> <p>(b) MCL (Maximum Contamination Level) obtained from 40 CFR Parts 141 (U.S. EPA 1994). Dashes (---) indicate no MCL applicable.</p> <p>(c) Secondary MCL, based on taste, odor, or color.</p> <p>(d) Action level.</p> <p>NOTE: J = Estimated concentration below the detection limit. U = Not detected. Sample quantitation limits are shown (<__U). B* = Analyte concentration is between the Instrument Detection Limit and the Contract Required Detection Limit.</p> <p>Concentrations in bold denote exceedance of MEG and/or MCL (primary levels). Only those analytes detected in at least one of the samples and chemicals of concern are shown on this table.</p>			

Compound/Analyte	Monitoring Event 10 AUG 1998	MEG ^(a)	MCL ^(b)
MW-NASB-066			
VOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8260 (F g/L)			
Total 1,2-Dichloroethene	0.4J	5	5
SEMIVOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8270 (F g/L)			
NONE DETECTED			
PESTICIDES BY EPA METHOD 8080 (F g/L)			
4,4'-DDT	(<0.10U)	0.83	---
4,4'-DDD	(<0.10U)	---	---
TOTAL PYRETHRINS AND ROTENONE BY MODIFIED EPA METHOD 8310 (F g/L)			
Total Pyrethrins	(<17U)	---	---
Rotenone	(<1.4U)	4	---
TARGET ANALYTE LIST METALS BY SW-846 6000/7000/9000 SERIES METHODS (F g/L)			
Aluminum	180B*	1,430	50–200 ^(c)
Antimony	(<1.0U)	---	6
Barium	19.2B*	1,500	2,000
Calcium	3,770	---	---
Chromium	(<4.0U)	100	100
Copper	(<2.0U)	---	1,300 ^(d)
Iron	2,640	---	300 ^(c)
Lead	1.5B*	20	15 ^(d)
Magnesium	1,190	---	---
Manganese	3,740	200	50 ^(c)
Mercury	(<0.10U)	2	2
Potassium	1,790	---	---
Sodium	14,100	---	---
Thallium	(<1U)	0.4	2
Zinc	39.1	---	5,000 ^(c)

Compound/Analyte	Monitoring Event 10 AUG 1998	Monitoring Event 10 AUG 1998 Duplicate	MEG ^(a)	MCL ^(b)
MW-NASB-067				
VOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8260 (Fg/L)				
NONE DETECTED				
SEMIVOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8270 (Fg/L)				
NONE DETECTED				
PESTICIDES BY EPA METHOD 8080 (Fg/L)				
4,4'-DDT	0.10	(<0.10U)	0.83	---
4,4'-DDD	(<0.10U)	(<0.10U)	---	---
TOTAL PYRETHRINS AND ROTENONE BY MODIFIED EPA METHOD 8310 (Fg/L)				
Total Pyrethrins	(<17U)	(<17U)	---	---
Rotenone	(<1.4U)	(<1.4U)	4	---
TARGET ANALYTE LIST METALS BY SW-846 6000/7000/9000 SERIES METHODS (Fg/L)				
Aluminum	172B*	238	1,430	50–200 ^(c)
Antimony	1.8B*	(<1.0U)	---	6
Barium	16.1B*	7.5B*	1,500	2,000
Calcium	11,600	10,900	---	---
Chromium	(<4.0U)	(<4.0U)	100	100
Copper	2.6B*	(<2.0U)	---	1,300 ^(d)
Iron	5,020	1,370	---	300 ^(c)
Lead	(<1.0U)	(<1.0U)	20	15 ^(d)
Magnesium	2,190	1,010	---	---
Manganese	1,420	91.2	200	50 ^(c)
Mercury	(<0.10U)	0.13B*	2	2
Potassium	3,400	1,380	---	---
Sodium	6,820	14,600	---	---
Thallium	(<1U)	(<1U)	0.4	2
Zinc	(<12.0U)	(<12.0U)	---	5,000 ^(c)

Compound/Analyte	Monitoring Event 10 AUG 1998	MEG ^(a)	MCL ^(b)
MW-NASB-068			
VOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8260 (F g/L)			
NONE DETECTED			
SEMIVOLATILE ORGANIC COMPOUNDS BY EPA METHOD 8270 (F g/L)			
NONE DETECTED			
PESTICIDES BY EPA METHOD 8080 (F g/L)			
4,4'-DDT	0.14	0.83	---
4,4'-DDD	(<0.10U)	---	---
TOTAL PYRETHRINS AND ROTENONE BY MODIFIED EPA METHOD 8310 (F g/L)			
Total Pyrethrins	(<17U)	---	---
Rotenone	(<1.4U)	4	---
TARGET ANALYTE LIST METALS BY SW-846 6000/7000/9000 SERIES METHODS (F g/L)			
Aluminum	234	1,430	50–200 ^(c)
Antimony	(<1.0U)	---	6
Barium	8.5B*	1,500	2,000
Calcium	11,100	---	---
Chromium	(<4.0U)	100	100
Copper	(<2.0U)	---	1,300 ^(d)
Iron	1,400	---	300 ^(c)
Lead	(<1.0U)	20	15 ^(d)
Magnesium	1,020	---	---
Manganese	90.7	200	50 ^(c)
Mercury	(<0.10U)	2	2
Potassium	1,430	---	---
Sodium	15,300	---	---
Thallium	(<1U)	0.4	2
Zinc	(<12.0U)	---	5,000 ^(c)

4. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

4.1 SUMMARY OF FINDINGS

4.1.1 Water Level Gauging Program

Ground-water flow is generally toward the south-southeast at Building 95. Note that site figures are not oriented north-south, but are rotated approximately 45 degrees. Ground-water flow patterns did not exhibit discernable seasonal variations.

4.1.2 Ground-Water Monitoring and Sampling Program

Notable results of the ground-water sampling and analysis program conducted at Building 95 during 1998 indicate the following.

Volatile Organic Compounds

There were no volatile organic compounds detected at concentrations above the corresponding State Maximum Exposure Guidelines or Federal Maximum Contamination Levels during the August sampling event. Samples from monitoring well MW-NASB-065 detected trace concentrations of two volatile organic compounds (ethylbenzene and total xylenes), and monitoring well MW-NASB-066 detected trace concentrations of one volatile organic compound (total 1,2-dichloroethene) at less than 1 F g/L during 1998.

Semivolatile Organic Compounds

Semivolatile organic compounds were not detected in the 4 wells sampled during the August sampling event.

Pesticides

No pesticides were detected at concentrations above the corresponding State Maximum Exposure Guidelines or Federal Maximum Contamination Levels in the 4 wells sampled during the August sampling event. Low levels of 4,4-DDT were detected in ground-water samples from monitoring wells MW-NASB-067 (0.10 F g/L) and MW-NASB-068 (0.14 F g/L).

Total Pyrethrins and Rotenone

Total pyrethrins and rotenone were not detected in the 4 wells sampled during the August sampling event.

Inorganics

Concentrations of manganese were reported above the corresponding State Maximum Exposure Guideline of 200 F g/L in 3 of 4 monitoring wells (MW-NASB-065, MW-NASB-066, and MW-NASB-067) sampled at the site during 1998.

4.1.3 Visual Inspection

Results of the site inspection activities indicated that numerous shrubs and evergreens appeared visibly stressed (lacking leaves or needles). Factors contributing to the stressed vegetation were not apparent, although an assessment of site vegetation is planned for 1999. Trees that were visibly stressed were removed from the site. Inspection of the excavated area confirmed no exposures of the geotextile cover at the ground surface, although an unrelated excavation project encountered a small portion of the liner approximately 50 ft north of MW-NASB-066, confirming the geotextile is present in that area. The 4 monitoring wells were found to be adequately labeled, capped, and locked. There was no indication of tampering of the site wells.

4.2 CONCLUSIONS

Based on the results of the one ground-water monitoring event at Building 95 during 1998, the following conclusions can be made:

- Monitoring wells are generally located downgradient of the areas of deepest excavation. Confirmatory sampling conducted outside the Long-Term Monitoring Program reported soil concentrations were below soil to ground-water pathway criteria (ABB-ES 1997) with the exception of one location (ABB-26; shown on Figure 2-1) located crossgradient of MW-NASB-067. Based on the confirmatory sampling results, the Navy does not believe a source of pesticide remains in the soil that would adversely impact ground water at Building 95.
- Ground-water samples from site monitoring wells show no significant impact by pesticides based on data collected from 1995 to 1998. Trace concentrations of pesticides have been reported in samples from 2 of 4 site wells during long-term monitoring sampling, although these concentrations have consistently been 3-4 times less than the State Maximum Exposure Guideline concentrations. It should be noted that Monitoring Event 10 (August 1998) was the first sampling event in which 4,4-DDT was detected in a sample from monitoring well MW-NASB-068 (0.14 F g/L). Pesticides have not been detected in samples from the other 2 site monitoring wells.
- Pyrethrins and rotenone have not been detected in samples from site monitoring wells in at least 2 years.
- Ground-water samples from site monitoring wells have not shown significant volatile organic compound or semivolatile organic compound impact.

- Site ground water has not been impacted by inorganic analytes. One inorganic (manganese) was reported above state or federal water quality criteria during 1998 sampling, although the Navy believes this metal is likely attributable to natural site conditions and is unrelated to past activities at the Building 95 site.
- Ground-water flow patterns show a consistent direction, and do not indicate that significant seasonal variations are present beneath the site area.
- Confirmatory soil and ground-water samples reported by Harding Lawson Associates on 5-6 May 1998 indicate that sample results were well below the preliminary remediation goal (135,000 Fg/kg for DDT) that had been established for the removal action. Ground-water samples collected at the Building 95 site also supported the conclusion that the soil removal action conducted in 1994 accomplished its objective (HLA 1998).

Based on Long-Term Monitoring Program results, the portion of the Building 95 site being monitored by the 4 wells has not been adversely impacted. A closure report is being revised that will assess whether removal actions have been successful.

4.3 RECOMMENDATIONS

Based on results of the one monitoring event of 1998 and an assessment of other LTMP results, the following changes are recommended at Building 95:

- Complete well gauging twice per year in April and August. The 4 site monitoring wells are recommended to be retained in the gauging program.
- Remove 3 monitoring wells from the sampling program (MW-NASB-065, MW-NASB-066, and MW-NASB-068). Pesticides have not been detected in samples from these wells since at least November 1996. No additional sampling of these wells is recommended.
- Reduce sampling parameters of MW-NASB-067 to pesticides only to be collected on an annual basis (August). Remove sampling requirements for volatile organic compounds, semivolatile organic compounds, pyrethrins and rotenone, and inorganic analytes.
- Conduct an inspection of vegetation which appear to be stressed to determine whether more appropriate species of trees should be planted, or whether other factors may be causing the observed stressed vegetation.
- Revise the site LTMP based on these recommendations.

REFERENCES

- ABB Environmental Services (ABB-ES). 1993. Action Memorandum, Building 95. April.
- ABB-ES. 1994a. Final Long-Term Monitoring Plan Building 95, Sites 1 and 3 and Eastern Plume. August.
- ABB-ES. 1994b. Technical Memorandum, Site 9: Neptune Drive Disposal Site. Naval Air Station, Brunswick, Maine. June.
- ABB-ES. 1997. Draft Closure Report for Building 95.
- EA Engineering, Science, and Technology. 1995. Quarterly Monitoring Report Event 1 -March 1995. Building 95, Naval Air Station, Brunswick, Maine. June.
- EA. 1998. Monitoring Event 10 – August 1998. Building 95, Naval Air Station, Brunswick, Maine. October.
- Harding Lawson Associates (HLA). 1998. Summary Report on Sampling and Analysis of Soil and Ground Water at Building 95 and Ground Water at Site 11. NAS Brunswick, Maine. 12 June.
- State of Maine Department of Human Services. 1992. Summary of State and Federal Drinking Water Guidelines. Revised September. Bureau of Health - Environmental Toxicology Program. 23 October.
- U.S. Environmental Protection Agency (U.S. EPA). 1994. National Primary Drinking Water Standards. Office of Water, Washington, D.C. EPA 610-P-94-001. February.

Appendix A

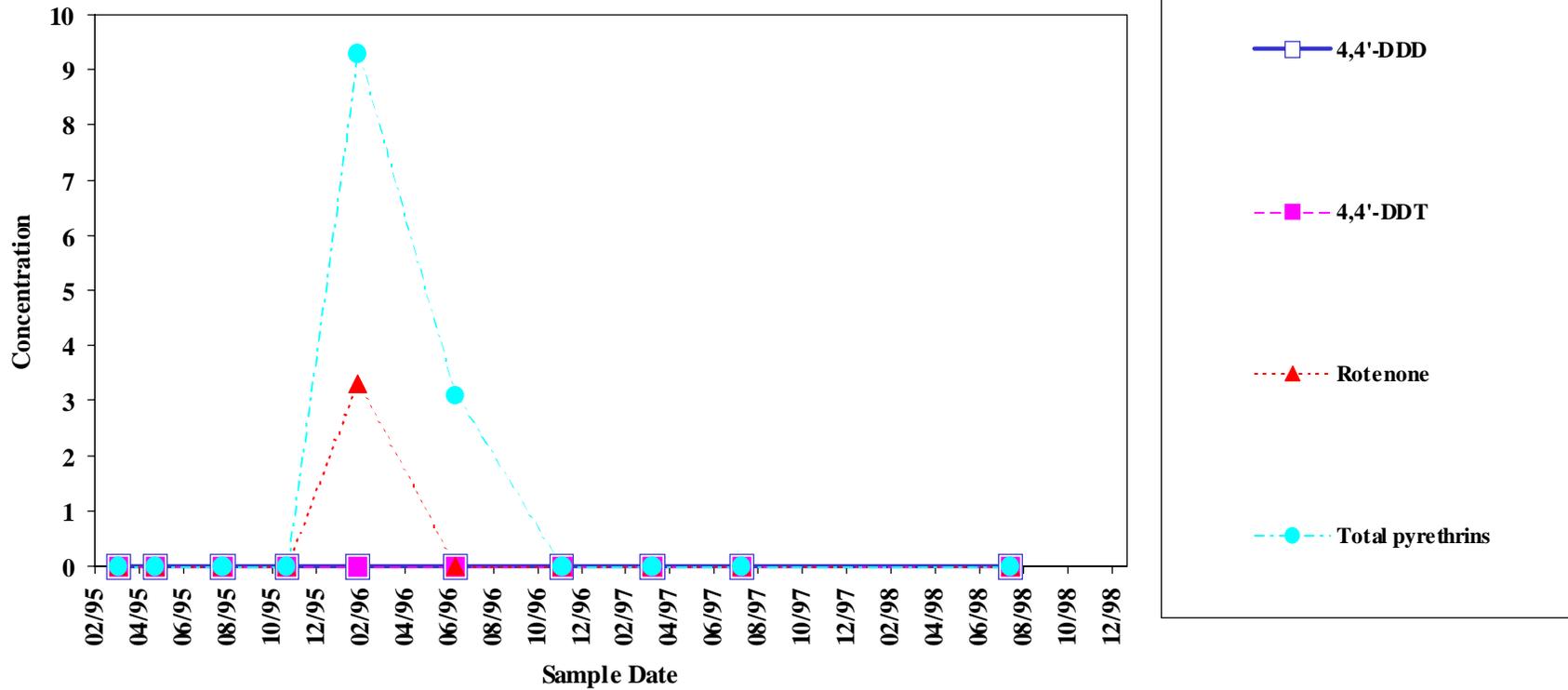
Ground-Water Pesticide and Volatile Organic Compound Trend Results March 1995 - August 1998

Sample Location:

MW-NASB-065

Building 95
Ground Water

Chemicals of concern: Pesticides



Sample concentration units: $\mu\text{g/L}$

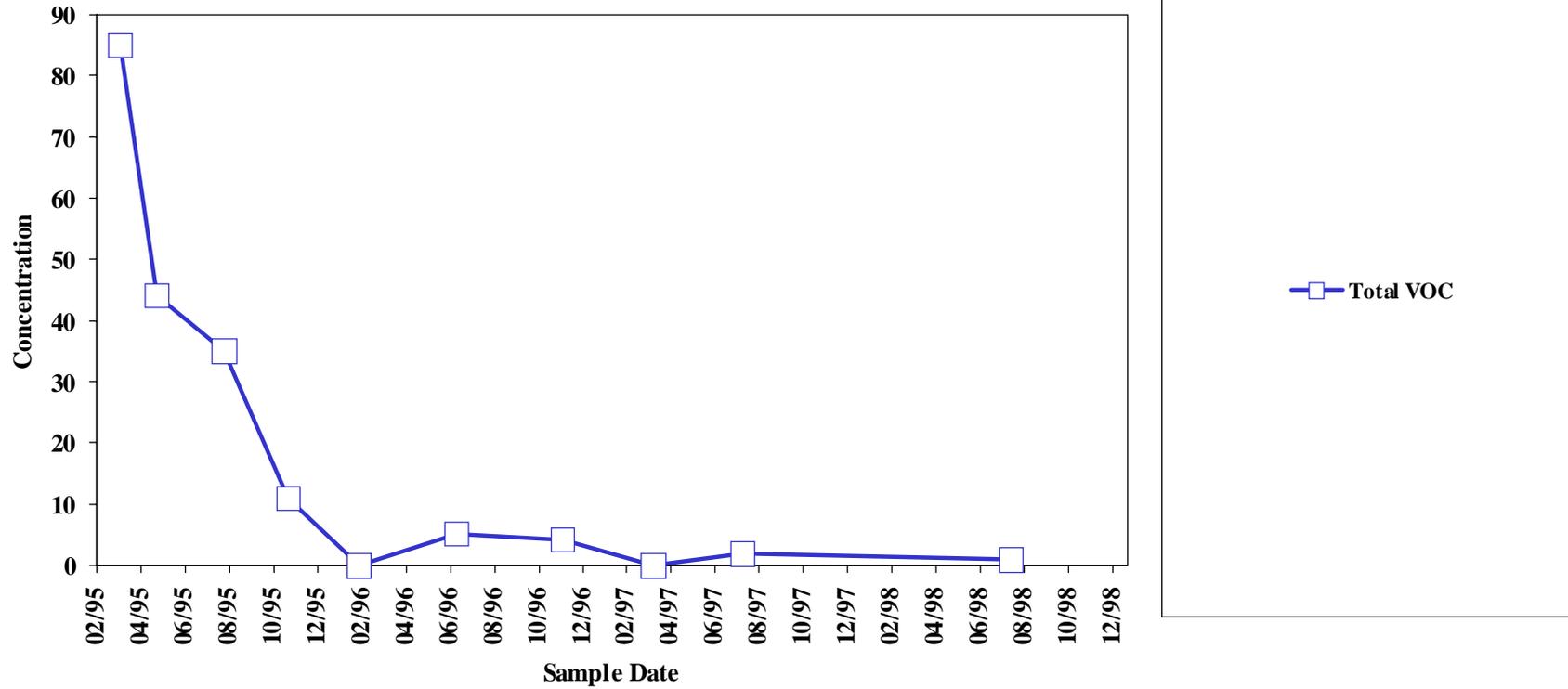
4,4'-DDT	
MEG:	0.83
MCL:	-

Sample Location:

MW-NASB-065

Building 95
Ground Water

Chemicals of concern: Volatiles



Sample concentration units: µg/L

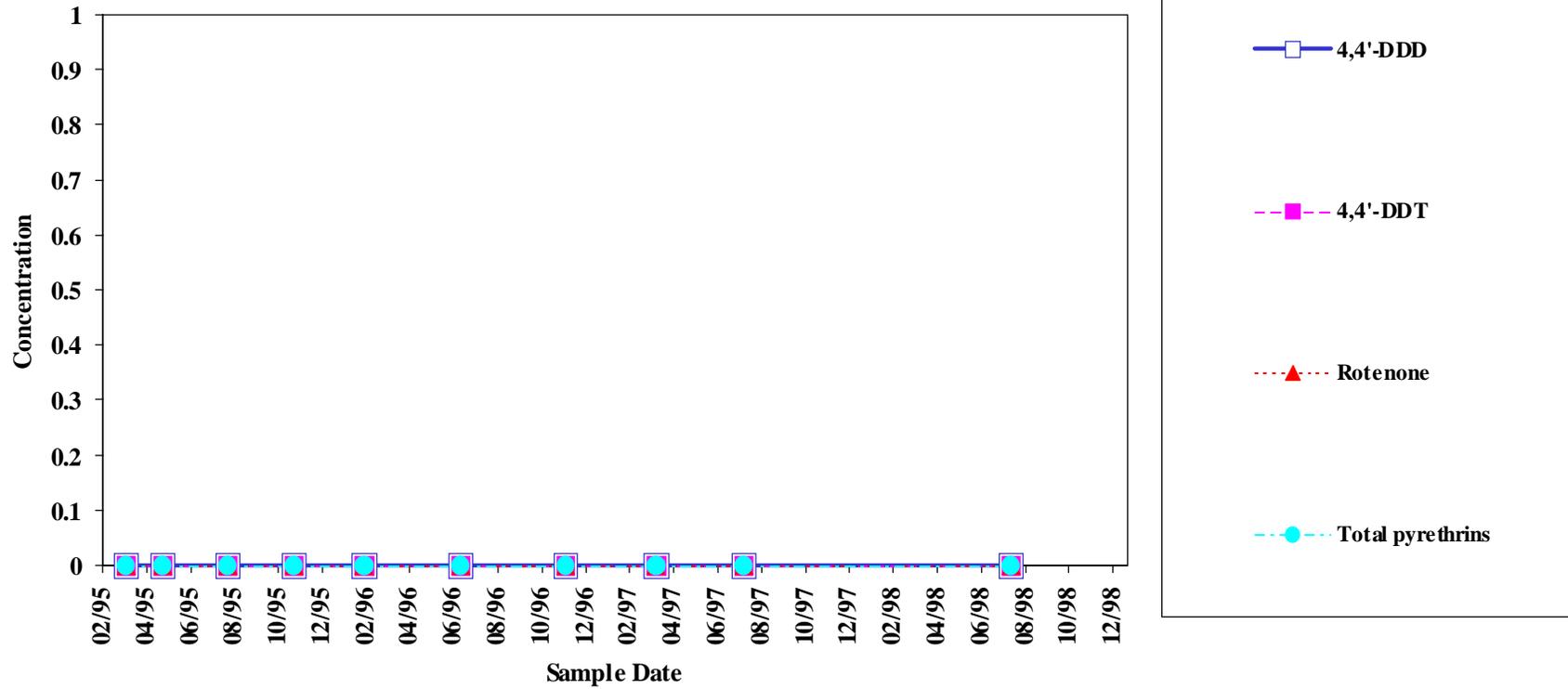
1,1,1-Trichloroethane	
MEG:	200
MCL:	200

Sample Location:

MW-NASB-066

Building 95
Ground Water

Chemicals of concern: Pesticides



Sample concentration units: $\mu\text{g/L}$

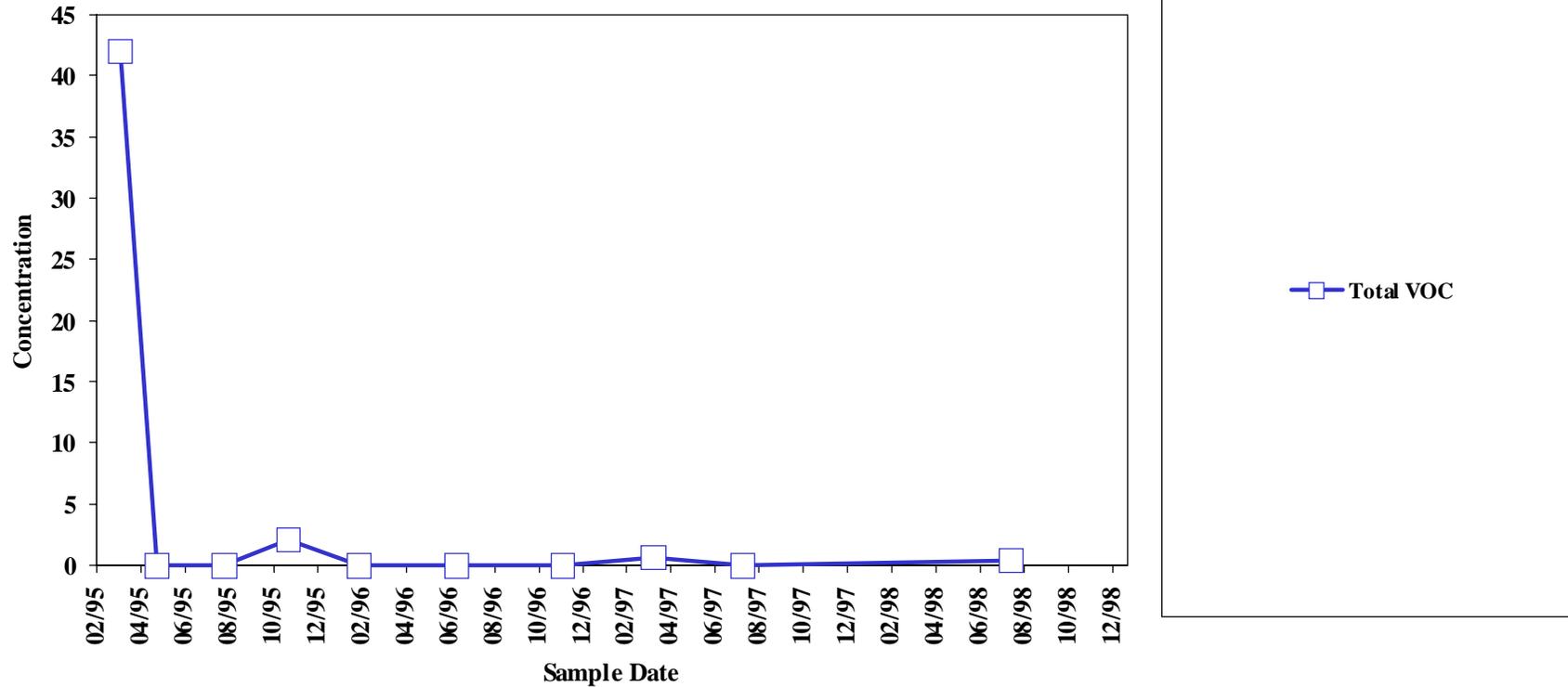
4,4'-DDT	
MEG:	0.83
MCL:	-

Sample Location:

MW-NASB-066

Building 95
Ground Water

Chemicals of concern: Volatiles



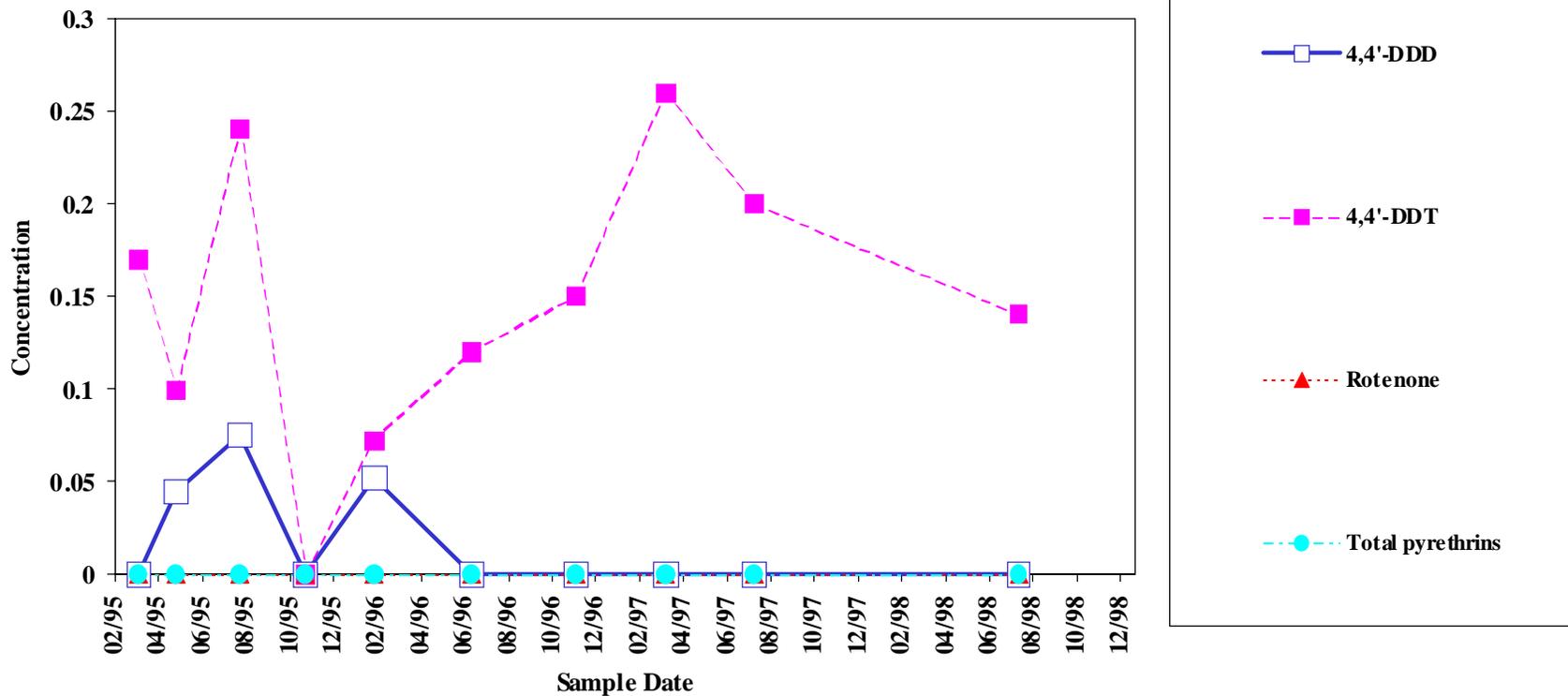
Sample concentration units: µg/L

1,1,1-Trichloroethane	
MEG:	200
MCL:	200

Sample Location:
MW-NASB-067

Building 95
Ground Water

Chemicals of concern: Pesticides



Sample concentration units: µg/L

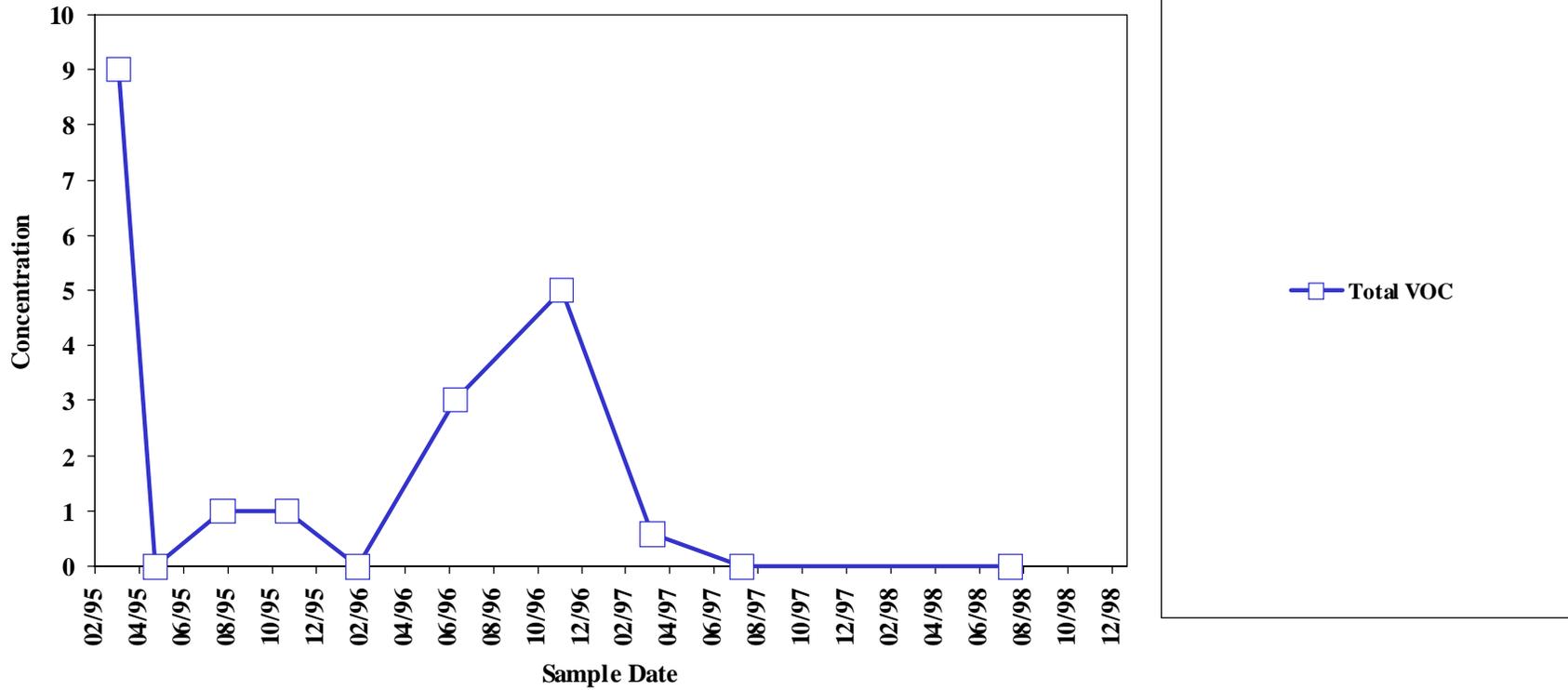
4,4'-DDT	
MEG:	0.83
MCL:	-

Sample Location:

MW-NASB-067

**Building 95
Ground Water**

Chemicals of concern: Volatiles



Sample concentration units: µg/L

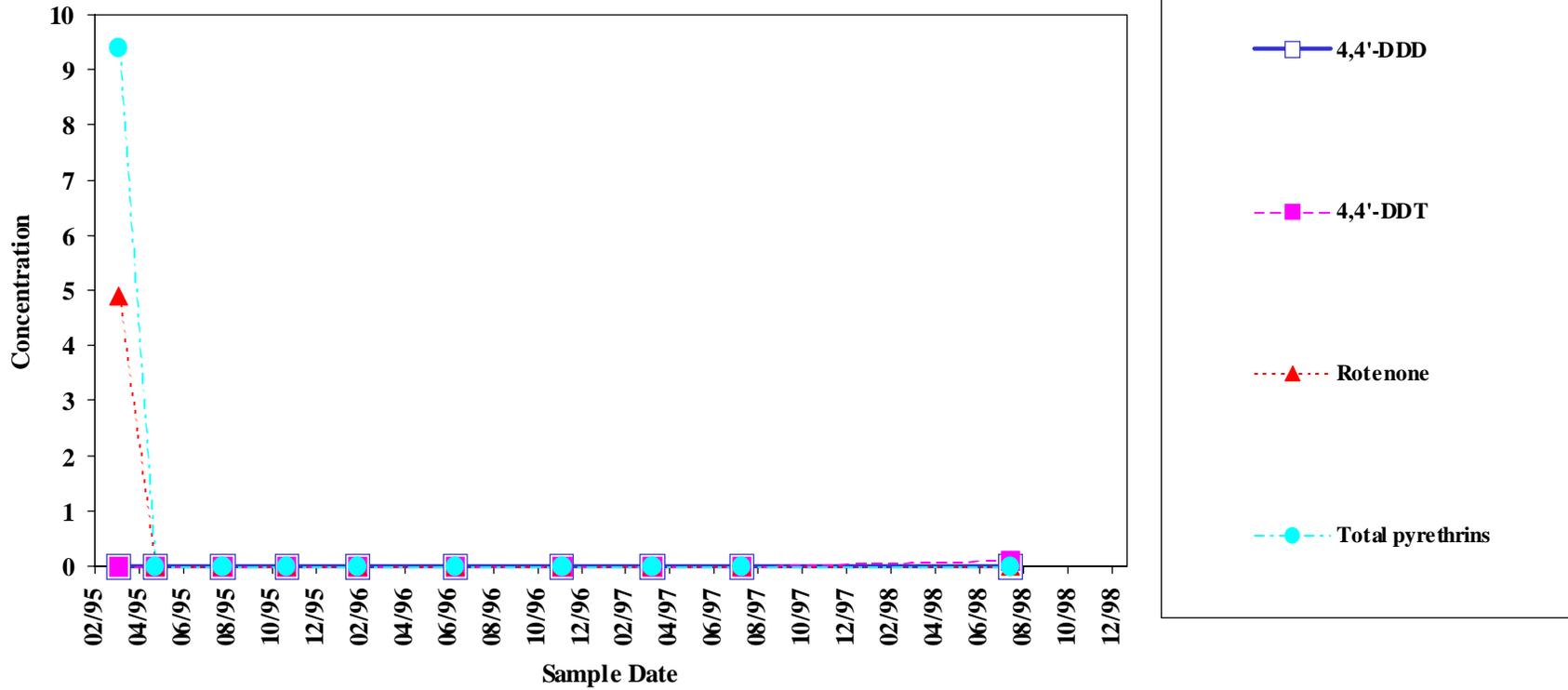
1,1,1-Trichloroethane	
MEG:	200
MCL:	200

Sample Location:

MW-NASB-068

Building 95
Ground Water

Chemicals of concern: Pesticides



Sample concentration units: $\mu\text{g/L}$

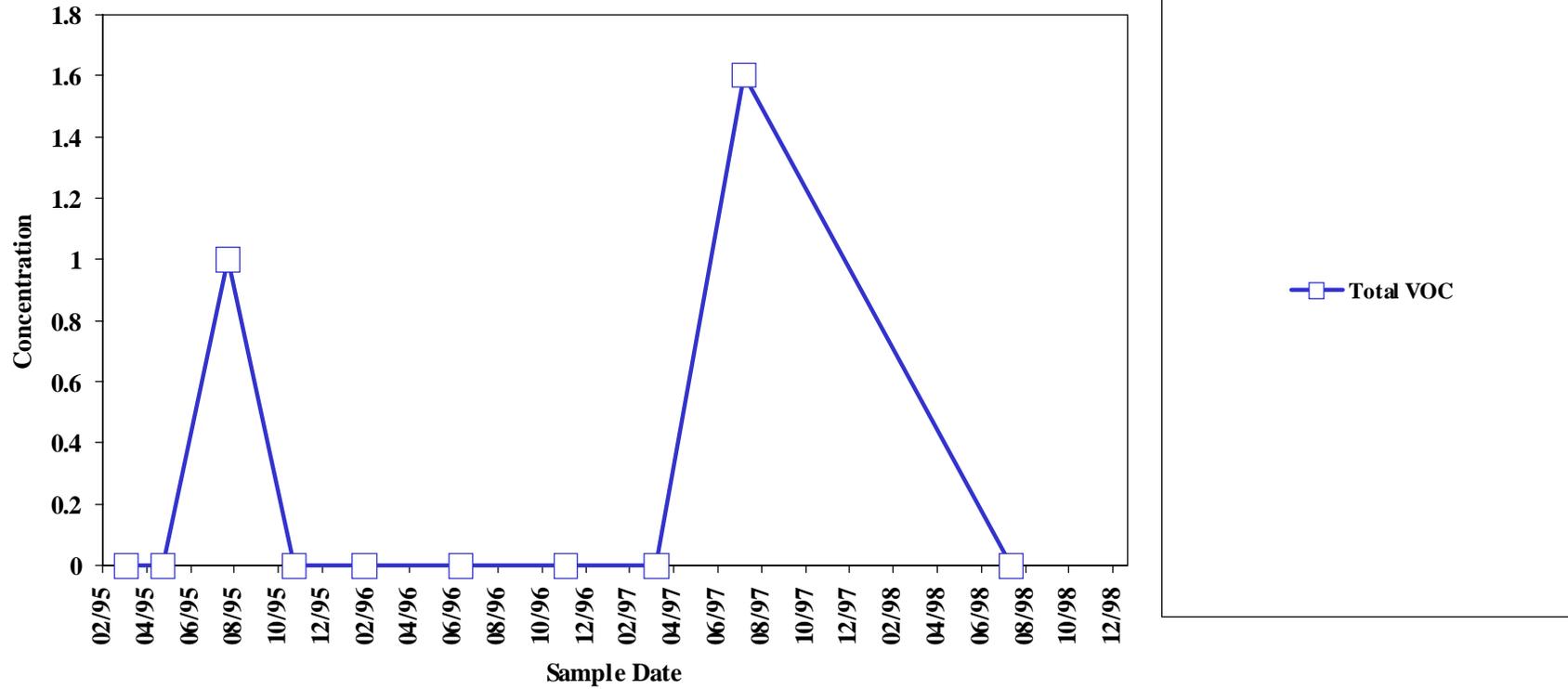
4,4'-DDT	
MEG:	0.83
MCL:	-

Sample Location:

MW-NASB-068

**Building 95
Ground Water**

Chemicals of concern: Volatiles



Sample concentration units: µg/L

1,1,1-Trichloroethane	
MEG:	200
MCL:	200

Appendix B

Response to Comments on 1997 Annual Report and Monitoring Event 10 Report

**RESPONSE TO COMMENTS FROM
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
ON 1997 ANNUAL REPORT, MONITORING EVENTS 8 AND 9, BUILDING 95,
NAVAL AIR STATION, BRUNSWICK, MAINE**

COMMENTOR: Claudia Sait

DATE: 1 October 1998

General Response to Comment: The Final 1997 Annual Report for Building 95 has been issued with text revisions based on comments, although figures and graphs have not been revised. The 1998 Annual Report included the changes to the figures and graphs of the 1997 Draft Annual Report.

GENERAL DISCUSSION

1. As documented by past Restoration Advisory Board minutes and letters from MEDEP, the MEDEP has repeatedly stated that a monitoring well downgradient of this site should be installed. Waste has been left in place; and without proper monitoring, accurate site evaluation and ground-water conditions cannot be assessed. This is a serious impediment to the Navy's proposal to early cessation of monitoring (see Comment Nos. 7 and 9 below).

Response—The Navy does not agree that waste was left in place at this site. The soil confirmatory samples were below MEDEP soil/ground-water pathway criteria and, therefore, the source was successfully removed. Further discussions have been held on this topic following issuance of the Draft 1998 Annual Report, and revisions to the Long-Term Monitoring Program at Building 95 are being considered.

SPECIFIC COMMENTS

2. *Purpose, Page 1-1, Section 1.2.1, 5th Sentence*—Due to the low reported detections of compounds of concern at this site, it was agreed by Restoration Advisory Board members that the sampling frequency be reduced from tri-annual to annual.

The Department has searched Restoration Advisory Board minutes, telephone logs, and correspondence. No record has been found that indicated the Department agreed to a reduction in monitoring frequency from tri-annual to annual. However, numerous MEDEP letters contained comments regarding concern with the current monitoring network for this site. This misunderstanding needs to be cleared up.

Response—Recommendations for the 1996 Annual Report indicated a reduction in the monitoring frequency from tri-annual to annual. No comments were received from MEDEP on the Building 95 1996 Annual Report, as noted in a letter from MEDEP dated 26 August 1997. Therefore, the Navy proceeded with annual sampling.

3. ***Geology/Hydrogeology, Page 2-1, Section 2.2, 3rd Sentence***—As part of remediation activities conducted at the site, the upper portion of the area of concern at the site was excavated, a geotextile liner was emplaced, and the excavation backfilled with clean fill.

Because the direct-push sampling this summer did not find evidence of the geotextile liner, its emplacement has been questioned. Apparently, no one at ABB-ES or MEDEP were onsite when the excavation was backfilled. It is known that the contractor was in a hurry to finish and leave the site. Unless proof of the existence of a liner is obtained, any reference to a liner should be deleted from the text.

Response—Liner is present and was observed during trenching for the Fuel Farm discharge pipe activities along the northern edge of the Building 95 site. This information was included in the Draft 1998 Annual Report.

4. ***Geology/Hydrogeology, Page 2-1, Section 2.2, 2nd Paragraph***—Results of the background ground-water sampling indicate that the highest detected concentrations of three inorganics (aluminum, manganese, and lead) have been reported at concentrations above corresponding State Maximum Exposure Guidelines (MEGs) and/or Federal Maximum Contaminant Levels (MCLs) for these analytes (ABB-ES 1994b).

As previously suggested by the Department, the lead exceedance occurred in only one background well (MW-801); that well has a history of producing turbid water samples (200 NTU) and is the only background well sampled with a peristaltic pump and is routinely purged dry. Other inorganic concentrations are quite high, as well as lead (Al, Fe, Zn). MW-801 is approximately 1,000 ft from Site 7 (Old Fuel Farm), which at times may be directly upgradient as the ground-water divide presumably shifts northwest-southeast between wet and dry years (see Figure 5-3 of the RI/FS report). Well MW-801 should be dropped from the background monitoring network. The high turbidity in this well is likely affecting the inorganic results. In truly representative background ground-water samples, lead concentrations will be less than its MCL of 15 F g/L.

Response—The monitoring wells that MEDEP is questioning in this comment and other comments (MW-801, MW-211B, and MW-NASB-020) have been dropped from discussions related to the background monitoring well network. In the 1997 Annual Report, the sentence in question has been changed to read as follows:

Of the reported inorganics, there were no concentrations above the corresponding State Maximum Exposure Guidelines (MEG).

The discussion related to the background metals concentrations in Section 3.2.3.5 has been revised based on the above information.

5. **Results of Ground-Water Monitoring and Sampling Program, Page 3-3, Section 3.2.3, 2nd Paragraph**—Two background monitoring wells (MW-211B and MW-801) [were] purged dry and did not reach equilibrium.

As previously renumerated, pumping monitoring wells “dry” prior to sampling is not an approved MEDEP procedure. Please correct this field procedure.

Response—Monitoring wells were sampled as part of Monitoring Event 9, and sampling procedures have been changed in subsequent events. Wells are no longer purged dry. Prior to sampling, water levels are measured. If it is determined that a well has less than 2 ft of water in the PVC casing, the well is sampled with a peristaltic pump. Please see response to Comment No. 4 discussing background well issues.

6. **Building 95, Page 3-5 Section 3.2.4.1, Bottom Sentence**—Several inorganics, including aluminum, calcium, iron, magnesium, manganese, potassium, and sodium, had detection frequencies of 100 percent, and are attributable to natural conditions found at the site.

It would be unusual to not detect these inorganics at a frequency less than 100 percent. The statement should be replaced by a comparison with background levels (minus MW-801), and summarize those occurrences that exceed background by 10-fold. If no result exceeds background by 10 times, then a statement should be made that the site apparently has no present significant effect on inorganic concentrations.

Response—After reviewing these comments and others from MEDEP and EPA, the Navy has decided to remove the Frequency of Analytical Detections in Ground Water sections of the 1997 Annual Report and from subsequent reports. The Navy believes the 10 times comparison to background inorganic concentrations is a good approach and will consider applying this comparison after the background monitoring well issue has been further discussed and resolved.

7. **Figures 3-1 through 3-7**—The ground-water flow direction arrows, as shown on Figures 3-1 through 3-7, are not as helpful or informative as continuous flow lines drawn across the contours from the upgradient monitoring well to the downgradient monitoring well. By drawing continuous flow lines on these maps, it is obvious that monitoring well NASB-068 is not actually downgradient of the excavated contaminant hot spot, located between the shed and Building 95. This is the reason the Department required that two direct-push ground-water samples be obtained this Spring (May 1998).

The results of the direct-push samples were negative for all contaminants of concern. Nevertheless, it is obvious that no downgradient wells exist for much of the site or for the waste left in place, south of Avenue B. Therefore, continued monitoring and additional monitoring wells are required for this site (Comment No. 9).

Response—The Navy does not believe waste was left in place, or that ground-water impact is likely. This position is supported by the direct-push sampling referred to above, where no concentrations of chemicals of concern were reported. The confirmatory sampling results showed DDT levels below the state soil and ground-water criteria and, therefore, the Navy believes the source was successfully removed. Please see response to Comment No. 1.

8. **Figure 3-7**—The configuration of water table contours is unrealistic. If the 69.25-ft contour does bend to the east as shown, the adjacent contours (69.0 and 69.5) must also have some easterly bend. Perhaps the measured water level elevation of MW-NASB-065 is erroneous. Please revise this map.

Response—Changing the contours as indicated will not significantly impact inferred flow direction, therefore, no change is warranted on the referenced figure. Future figures will show increased contour curvature if warranted. No change was made to this figure.

9. **Water Level Gauging Program, Page 4-1, 1st Paragraph**—Based on the dominant flow patterns observed at the site, well MW-NASB-066 is located hydraulically upgradient of the former building locations, and wells MW-NASB-065, MW-NASB-067, and MW-NASB-068 are located hydraulically downgradient and crossgradient of the former building locations.

MEDEP notes that Figures 3-1 to 3-7 indicate that only MW-NASB-067 is directly downgradient of any site building (shed), while MW-NASB-065 is crossgradient and MW-NASB-068 may be barely downgradient of the corner of former Building 31. This statement as written is misleading in regards to the adequacy of the existing monitoring network for ground-water impact, should a plume actually exist.

Response—The Navy does not agree a plume is present at Building 95 and requests evidence from MEDEP to support this claim. See response to Comment No. 1. For clarity, the discussion of the location of monitoring wells compared to removed site structures has been eliminated from the 1997 Annual Report.

10. **Water Level Gauging Program, Page 4-1, 2nd Paragraph**—Recorded water table elevations did not exhibit a discernible seasonality trend.

This statement is true regarding direction of ground-water flow, but does not hold for seasonal differences in water table elevation due to natural recharge. Please rewrite and be more specific.

Response—The Navy has revised the sentence as follows:

Ground-water flow patterns did not exhibit a discernible seasonable trend.

11. **Recommendations, Page 4-3, 2nd Bullet**—Change the phrase “will be discontinued” to “should be discontinued.”

The Department cannot agree with this recommendation based on the lack of downgradient wells for this site as noted above. Also, low levels of DDT are evident in MW-067 and the other wells are not positioned to provide representative condition of this site.

Response—The Navy has changed the phrase as indicated in this comment in the 1997 Annual Report. The Navy anticipates further discussion of MEDEP’s concern on the need for a downgradient well during 1999.

**RESPONSE TO COMMENTS FROM
U.S. ENVIRONMENTAL PROTECTION AGENCY
ON 1997 DRAFT ANNUAL MONITORING REPORT,
BUILDING 95 SITE, NAVAL AIR STATION, BRUNSWICK, MAINE**

COMMENTOR: Michael Barry

DATE: 22 September 1998

General Response to Comments: The Final 1997 Annual Report for Building 95 has been issued with text revisions based on comments, although figure and graph revisions were minimal. The 1998 Annual Report included the changes to the figures and graphs of the 1997 Draft Annual Report.

GENERAL COMMENTS

1. The bi-monthly well gauging program no longer appears necessary. This subject is covered in more detail under a separate letter. Well levels should continue to be taken in conjunction with sampling events.

Response—The Navy agrees that flow patterns are well documented at Building 95 and less frequent gauging is warranted.

2. The EPA is in general concurrence with the conclusions in that ground water at Building 95 does not appear to be adversely impacted, and that the removal actions have been successful. However, attributing thallium to natural site conditions does not appear to be supported by information available in the report. Specific Comment Nos. 6, 9, 11 12, 13, and 14 also regard this issue.

Response—The Navy agrees with the EPA's assessment that removal actions have been successful. The Navy believes attributing thallium to natural conditions is accurate, but should be discussed with MEDEP and EPA. The following sentence has been added at the end of the second paragraph of Section 2.2 (Geology/Hydrogeology) in the 1997 Annual Report:

Thallium was not detected in ground-water samples collected at background wells during Monitoring Event 9 (November 1997), although levels were reported at concentrations ranging up to 2.1 Fg/L in samples collected during 1994 as part of the background well sampling. Subsequent sampling conducted during Monitoring Event 10 (August 1998) did not detect thallium in site wells.

3. The EPA cannot concur with the recommendation regarding ceasing the ground-water sampling program entirely because DDD/DDT remain in place and are also present in the ground water at the same order of magnitude as the MCL (though lower than). After the 1998 sampling data are available, this matter should be discussed by the RAB prior to a final

decision. Based on the results to date, the agency believes that markedly reducing the number of wells and sampling frequency in addition to eliminating some classes of compounds is justified.

Response—The Navy agrees that a significant reduction of wells, sample analytes, and sample frequency is warranted and looks forward to discussing these issues. Recommendations in the 1998 Annual Report include reducing the number of wells to be sampled, and reductions in the list of sample parameters.

4. The results trend table and charts in Appendix A were a great addition to the report and aided data analysis significantly. Thanks!

Response—No response required.

5. Since Building 95 is not included in the Federal Facility Agreement and because it was resolved under RCRA and not by an ROD, there is no statutory requirement under CERCLA for review of this site. This site should also not be included in the site-wide 5-year review reports in the event that the project team decides to undertake a 5-year review at Building 95.

Response—The Navy agrees that this site will not be included in the site-wide 5-year review reports and will be addressed under a separate program. Reference to the 5-year review has been removed from the 1997 Annual Report.

SPECIFIC COMMENTS

6. Table 2-1 should include background concentrations for thallium to support the claim that thallium is due to natural site conditions in Section 3.2.3.5. See Comment Nos. 9, 11, 12, 13, and 14.

Response—Background samples collected during 1997 did not report thallium, although the Navy believes reported concentrations of thallium are not attributed to past activities at Building 95. The second to last sentence of Section 3.2.3.5 of the 1997 Annual Report has been revised as follows:

Background concentrations of manganese and thallium were reported in concentrations exceeding the State MEG and MCL during 1990/1991 background well sampling (ABB-ES 1994b), although thallium was not detected during sampling in Monitoring Event 9.

7. **Section 3.2.3.1, Page 3-4**—The EPA notes the small and/or decreasing VOC concentrations. The charts in Appendix A dramatically display this trend; see also Comment No.11.

Response—The Navy agrees that the VOC concentrations are small and have been decreasing.

8. **Section 3.2.3.3, Page 3-4**—The charts again were very helpful. Several items were noted:

- Results for MW-NASB-065 in February 1996 and June 1996 are blatantly inconsistent with the trend, possibly due to either disruption from the soil removal in 1995 or a laboratory contaminant issue? In any case, results have returned to non-detect and are not a concern to the EPA.
- For MW-NASB-067, though the concentrations are small, a trend for DDT may be discernable. Results from the 1998 sampling by Harding-Lawson Associates (HLA) in nearby PS-9501/9502 yielded a similar result for DDT of ND/0.20 ppb. DDD, however, was indicated by the HLA event at 0.44/0.20 ppb while all monitoring wells were non-detect in 1997.
- For MW-NASB-067, the round in October 1995 is inconsistent with the trend.
- MW-NASB-067 seems to be the only monitoring well of any interest for future tracking of pesticide concentrations.

Response—The Navy agrees with the EPA observations, and that samples from monitoring well MW-NASB-067 detected the only pesticides during 1997 and 1998 sampling. The Navy would be interested in discussing future sampling requirements for MW-NASB-067.

9. **Section 3.2.3.5, Pages 3-4 and 3-5**—Background results for thallium are not given to evaluate and support the claim that thallium concentrations are within site background levels. Though it is unlikely that the thallium concentrations detected (1.3 ppb) present a human health or ecological risk, these data should be stated and added to Table 2-1. Thallium levels are noted to exceed the MEG of 0.4 ppb, but are below the MCL of 2.0 ppb. The EPA concurs that manganese levels are attributable to natural site conditions.

Response—Please see response to Comment No. 2 related to thallium. The Navy agrees that reported concentrations detected (1.3 ppb) do not present a human health or ecological risk and are likely unrelated to site activities.

10. **Figure 3-7, Water Table Elevations, 4 November 1997**—The reason for curving the 69.25 elevation line only toward MW-NASB-065 is not clear. Ground-water gradients appear to be relatively constant in both magnitude and direction during the entire program. The only exception is Monitoring Event 9, in which the magnitude was about 25 percent less than the abnormal gradient of 0.01 ft/ft. This does not appear significant though.

Response—The 69.25-ft contour was curved in response to the measured elevation at MW-NASB-065 (69.20). The Navy agrees that this variation is not significant, and that generally consistent flow patterns are observed at Building 95. This figure has not been changed.

11. *Tables 3-2, Analytical Results*

- Trace levels of VOC in all site monitoring wells are noted. However, these sporadic detection levels are far below MCLs/MEGs and thus do not present a hazard to human health or the environment, nor is there a discernable trend indicating a future hazard. Future VOC sampling would not appear to produce any benefit.
- MW-NASB-067 was the only well with detectable pesticides, with DDT at 0.26 and 0.20 ppb in 1997. This well was also the only one with non-sporadic detections sufficient to track a trend. Independent analysis by HLA at nearby location PW-9502 indicated DDT at 0.20 ppb in 1998 as well. These steady results at about 25 percent of the risk-based MEG impact high confidence to the data lead EPA to believe that significantly less than semi-annual sampling, if any, is required to monitor pesticide concentrations.
- Regarding inorganics, no trends are clear and most MEG/MCL exceedances are consistent with natural site conditions and/or do not present a human health or ecological hazard. Assuming the thallium issue in Comment Nos. 2, 6, and 9 is resolved, future inorganics sampling would not appear to produce any useful data or benefit.

Response—The Navy agrees that future VOC sampling would not appear to be a benefit. The Navy agrees that less frequent sampling would be required to monitor pesticide concentrations, and that future inorganics sampling would not appear to produce any useful data or benefit. Therefore, we have recommended that this analysis be dropped from future sampling. These recommendations have been included in the 1998 Draft Annual Report.

12. **Section 4.1 Findings, Page 4-2, Inorganics Bullet**—Same as Comment Nos. 2, 6, 9, and 11. Information in the report does not support that thallium is due to natural site conditions. Assuming thallium is present at site background on this order of magnitude, adding thallium to Table 2-1 would resolve this comment. The agency concurs with other findings in Section 4.1.

Response—Thallium was reported in previous background sampling collected during 1994 at concentrations up to 2.1 Fg/L, although it was not detected in 1997 background samples. Please see response to Comment Nos. 2, 6, and 9 related to thallium.

13. **Section 4.2, Second Bullet**—Same comment as in Nos. 2, 6, 9, 11, and 12 above regarding thallium (concur with manganese).

Response—See response to Comment Nos. 2, 6, and 9 related to thallium.

14. **Section 4.3, Second Bullet**—The EPA concurs in eliminating pesticide sampling at MW-NASB-065, MW-NASB-066, and MW-NASB-068. Assuming thallium is resolved, EPA also concurs with eliminating SVOC, VOC, and inorganics sampling entirely. The remaining sampling program should be discussed with the RAB after the 1998 results are available. If these results follow the current trend, the EPA would envision infrequent pesticide sampling at MW-NASB-067; such as approximately every 5 years as the most often.

Response—The Navy agrees that eliminating SVOC, VOC, and metals is advisable at this site. The most appropriate sampling frequency has been discussed following issuance of the Draft 1998 Annual Report.

15. **Appendix A, Charts**—The EPA lauds expanding the “y” axis scales to show trends and as much detail as possible, such as pesticides on MW-NASB-067. However, I recommend these scales be chosen carefully, especially with sporadic detections of non-contaminants of concern compounds where no trend is discernable. Volatile organic compounds on MW-NASB-068 are an example. Though the VOC concentrations are very small, they look like a large issue at first. With a closer look, one sees that the concentrations are very small, and that only 0.9 ppb of the VOCs are actually due to a contaminant of concern (TCA). Choosing a common “y” axis scale for the same compounds for all wells may lose some display detail of the data but would aid in comparison and put concentrations in perspective.

Response—The Navy will endeavor to include as much data as possible. Unfortunately, that may require the use of a “y” axis in some cases which presents all data, but may make small VOC detections seem exaggerated.

**RESPONSE TO COMMENTS FROM
MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
ON MONITORING EVENT 10,
BUILDING 95, NAVAL AIR STATION, BRUNSWICK**

COMMENTOR: Claudia Sait

DATE: 5 March 1999

GENERAL COMMENTS

1. Why does Figure 2 have an approximate distance scale? A scale of 1.05 in. = 45 ft is very difficult to use, and projects a poor image to the public. A better base map is that of Figure 2-2 of the Draft Closure Report (January 1997).

Response—This comment is noted, and Figure 2 has been revised for the Draft 1998 Annual Report to include additional site details.

2. Now that the monitoring events are spaced at 1-year intervals, the monitoring event report also becomes the annual report. As such, these reports need to be interpretative and include a summary of present site conditions (ground-water flow and contaminant concentrations).

Response—Beginning in 1999, one Annual Report will be issued for Building 95. Separate monitoring event reports will not be prepared.

3. As has been pointed out previously, only one of the four monitoring wells is located in the downgradient region of the site. Given that the location of that well (MW-NASB-068) is not downgradient of Building 95 and its drum storage rack, the Department will continue to insist that at least one new monitoring well be installed and incorporated into the site's long-term monitoring program. The Department recommends that a well be located just to the southeast corner of former Building 95.

Response—The soil confirmatory samples were below MEDEP soil/ground-water pathway criteria and, therefore, the source was successfully removed. Based on the low reported detections at Building 95 wells, the Navy does not believe that an additional well is necessary.

4. The Department notes that, overall, the presence and concentration level of DDT in ground water has not changed significantly at the four existing monitoring locations, although MCLs/MEGs are not exceeded.

Response—No response required.

SPECIFIC COMMENTS:

5. *Figures 3, 4, and 5 (interpreted water table elevations)*—Figure 3 contouring shows a substantial southern bending on the middle contour. Comparison with the other figures and their elevations indicate that on 6 May 1998, the elevation of NASB-065 was high relative to the other wells. In Appendix A-1 (Field Record of Well Gauging Forms), it was noted that

heavy rain fell this day. This difference between gauging events and the occurrence of heavy rain on 6 May should be discussed in Section 1.1.2.

Response—Subsequent reports and figures note how much precipitation occurred before and during gauging events so the reader is aware of these conditions.

MEDEP agrees that the center contour shown on Figure 3 was correctly drawn, and believes that the lowest elevation contour also has curvature that is not represented. MEDEP strongly disagrees with the ground-water flow arrows, which ignore the bending of the center contour line. Once more, the Department requests that the short flow arrows be replaced by continuous flow lines (suggest three lines for this site).

Figure 3 indicates that ground-water flow can shift southward so that flow lines would travel from the shed to Building 95. (Water elevation data for 3 September 1996 also indicated this direction of movement.) This, in turn, supports the Department's long-standing position that a new monitoring well is needed near the former location of Building 95. Water elevation gauging at this location would also clarify the magnitude of flow direction shifts. Contouring with the existing four wells cannot accurately describe flow direction for the downgradient area, as three of the wells are located along a nearly straight line.

Response—The flow arrows on potentiometric surface maps are drawn to show general flow patterns at this site and are not an attempt to illustrate specify flow at all points. Please see response to Comment No. 3 regarding the need for an additional monitoring well at this site.

6. **Table 3 (Summary of Water Quality Indicator Parameters)**—The Department notes that the dissolved oxygen content in ground water from all four wells is very low (approximately 1 mg/L). With the water table lying less than 10 ft below the ground surface, the measurements are surprisingly low. In March 1997, dissolved oxygen concentrations were also less than 1 mg/L. The Old Fuel Farm grounds are immediately crossgradient to Building 95. Perhaps a low “DO shadow” at the Fuel Farm has expanded to include the Building 95 area. In any event, a strong reducing subsurface environment exists, which likely explains the relatively high iron and manganese concentrations.

Response—The Navy agrees that this comment is plausible and may explain the elevated concentrations manganese and other inorganic compounds at this site.

**RESPONSE TO COMMENTS
FROM U.S. ENVIRONMENTAL PROTECTION AGENCY
ON MONITORING EVENT 10, BUILDING 95,
NAVAL AIR STATION, BRUNSWICK**

COMMENTOR: Michael Barry

DATE: 1 December 1998

OBSERVATIONS

1. DDT concentration continued downward in MW-067 but rose in MW-068 after many undetected rounds. This could indicate DDT transport and/or decay. DDT levels were at the same order of magnitude, but less than the MEG of 0.83 ppb. MW-065/066 remains free of DDT/DDD.
2. The ground-water gradient remained steady at about 0.01 ft/ft in a SE direction.
3. DDT concentrations were very similar in MW-067 and PW-9501/9502, which were sampled in May 1998 by Harding-Lawson. This indicates to EPA that MW-067 is representative of ground water between the shed and Building 95.
4. VOC and metals were below MEG/MCLs, except for manganese which is due to site background.
5. Thallium was not detected in any wells on this event. Proving that thallium detections were due to background was an EPA comment to the draft closure and 1997 annual reports.

COMMENTS

GENERAL RESPONSE: Although response to comments were not requested, the Navy has responded to these comments to facilitate discussion on potential changes to the Building 95 sampling program.

1. The results of the 10 monitoring events indicate to EPA that yearly sampling of all four monitoring wells is not required. We recommend that MW-067/068 be sampled for pesticides in 2000 to support a 5-year review type of process (even though Building 95 is not strictly part of the CERCLA process at Brunswick).

Response—The Navy agrees that continued sampling of the four monitoring wells at Building 95 is not required.

Current pesticide levels are less than the MEG/MCL, but soil sources are still in place and concentrations rose in MW-068.

Response— Subsequent sampling has indicated sporadic pesticide concentrations at MW-NASB-067 at concentrations below the MEG or MCL.

- (a) Recent and long-term trends show that concentrations are stable within a range and should not rise above MEG/MCL within 2 years.

Response—The Navy agrees with this assessment and notes pesticide concentrations have been decreasing since 1997 at MW-NASB-067.

- (b) Depending on the results in 2000, EPA would expect pesticide sampling again in 2005, or not at all. Well locations could also be changed per 2000 results.

Response—The Navy anticipates further discussion on this point during 1999.

- 2. Well gauging events have resulted in steady ground-water gradients; we feel that performing these events with sampling events is often enough.

Response—The Navy agrees that well gauging can be scaled back to twice per year.

- 3. We believe the data show that the existing well network adequately monitors site ground-water conditions relative to site risks. If another well is installed, we recommend the area between MW-068 and southeast corner of Building 95. It could be either a microwell or direct-push since a long-term well may not be needed.

Response—The Navy anticipates further discussion on this subject as part of closeout of soil and ground water at Building 95 which is currently being negotiated with MEDEP and EPA.

- 4. VOC and metal sampling, except for thallium, is no longer required. Data showing that thallium is due to area background conditions would satisfy EPA and remove any need to sample for thallium.

Response—The 1998 Annual Report recommends limiting the sample parameters at this site to pesticides only. Please see response to MEDEP and EPA comments on the 1997 Annual Report for further discussion on thallium.