Monitoring Event 16 Report – September 2002 for Building 95 Naval Air Station, Brunswick, Maine

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

Prepared for

Department of the Navy
Engineering Field Activity Northeast
Naval Facilities Engineering Command
North Loop & American Way, Building G
Code 182
Lester, Pennsylvania 19113-2090

Prepared by

EA Engineering, Science, and Technology, Inc.
Southborough Technology Park
333 Turnpike Road, Route 9
Southborough, Massachusetts 01772

October 2004
FINAL
296.0047

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Alexander C. Easterday, P.G.
CTO Manager

8 October 2004
Date

Kenneth W. Kilmer
Program Manager

8 October 2004
Date

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QUALITY REVIEW STATEMENT

Contract No. N62472-92-D-1296
Contract Task Order No. 0047
Activity: Naval Air Station, Brunswick, Maine

EA Project No.: 29600.47

Description of Report/Deliverable:

Final Monitoring Event 16 Report – September 2002 for Building 95, Naval Air Station, Brunswick, Maine

EA CTO Manager: Alexander C. Easterday, 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

Peter Nimmer

8 October 2004

Peter L. Nimmer, P.G.
Senior Engineer

(Date)

QUALITY REVIEW STATEMENT

Contract No. N62472-92-D-1296
Contract Task Order No. 47
Activity: Naval Air Station, Brunswick, Maine

EA Project No.: 29600.47

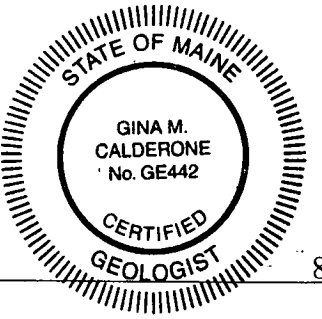
Description of Report/Deliverable:

Final Monitoring Event 16 Report – September 2002 for Building 95, Naval Air Station, Brunswick, Maine

EA CTO 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.



Certified Geologist Reviewer

Gina M. Calderone, CPG
State of Maine Certified Geologist (No. GE442)

8 October 2004
(Date)

CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. PROJECT ACTIVITIES AND MONITORING EVENT RESULTS

1.1 INTRODUCTION

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

This report provides the results of the monitoring and sampling completed during Monitoring Event 16 (September 2002). Section 1 describes the activities completed during this monitoring event. Temporal trends and other observations based on data collected during bi-annual monitoring are presented in Section 2. Recommendations are provided in Section 3. Appendix A provides the response to comments on the draft report. Appendix B provides the laboratory analytical data summary table. Appendix C provides temporal trend graphs. Appendix D provides an analytical data quality review. Appendix E provides field monitoring and sampling forms. Appendix F provides the engineering site inspection report. Appendix G provides analytical report Form I data tables. Appendix H provides a historical summary of the site.

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 1993 (ABB-ES 1993). A Long-Term Monitoring Plan (LTMP) was established pursuant to the Record of Decision (ABB-ES 1994). The LTMP document establishes the requirements for monitoring/sampling to be conducted on a periodic basis. The Building 95 long-term monitoring well locations are summarized on Table 1.

Building 95 and surrounding structures comprise 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'-dichlorodiphenyl-trichloroethane (DDT) and pyrethrins (an insecticide), in the soil and on structures at the site. Additionally, low concentrations of pesticides and inorganics were reported in groundwater samples (ABB-ES 1993).

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 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 (ABB-26) reported concentrations of DDT above soil to groundwater pathway criteria (ABB-ES 1998). The extent and depth of the excavated area is shown on Figure 2.

Groundwater samples were collected from monitoring wells MW-NASB-067, MW-NASB-097, and MW-NASB-098 (groundwater monitoring well MW-NASB-067 was re-instated into the monitoring event program beginning with the April/May 2001 long-term monitoring event).

1.2 PROJECT BACKGROUND

Although sampling is planned for up to a 30-year period, periodic evaluations will provide a basis for continued sampling and for proposing refinements/alterations to the monitoring program or remedial activity, if appropriate.

The Building 95 long-term monitoring well locations are summarized on Table 1. Due to the reported low detections of contaminants of concern at this site, the sampling frequency was reduced from quarterly to tri-annual in June 1996 following approval by the State of Maine Department of Environmental Protection (MEDEP) and U.S. Environmental Protection Agency (EPA) Region 1. Monitoring Event 9 (EA 1997) began the initiation of annual sampling at this site. Beginning in 2000, the sampling frequency was modified to two rounds per year (April and September). The monitoring program was reassessed based on the results of the two sampling events in 2000 when monitoring well MW-NASB-067 was returned to the long-term monitoring sampling program as of April 2001. It was agreed upon by the Navy and MEDEP that samples collected during Monitoring Event 13 (May 2001) would be analyzed for volatile organic compounds and pesticides, including the pesticide rotenone. Maleic hydrazide was added to the Fall 2001 sampling event after the Navy discussed the April/May 2001 monitoring event results with MEDEP and EPA.

Contaminated soil above concentrations that exceed the human health risk assessment preliminary remediation goal was excavated and removed for disposal and clean soil was used as backfill. Some soil at concentrations below human health preliminary remediation goals and above ecological preliminary remediation goals was buried below the surface south of Avenue B. The extent of the excavation and burial areas is shown on Figure 3.

Discussions between the Navy and MEDEP regarding first round and second round analytes were established as noted below:

- First round analytes included a broad list of analytes including those noted in historical records that may have been stored or used at the site. Second round analytes include a smaller list of compounds that are more likely to have been used at the site.

- Based upon site historical information and laboratory data issued to MEDEP by the Navy on 3 July 2001 via email, and discussions between MEDEP and the Navy, MEDEP agreed to remove avitrol as a potential second round analyte from the groundwater sampling program at Building 95 (MEDEP 2001).

- Beginning with the September 2001 sampling event, the Navy agreed to analyze groundwater samples for the pesticide rotenone (fourth round of rotenone data) by EPA

Method 635 and maleic hydrazide (third and fourth rounds of maleic hydrazine, including the April 2002 and September 2002 sampling events) by EPA Method 632 Modified.

- Groundwater samples were collected from monitoring wells MW-NASB-067, MW-NASB-097, and MW-NASB-098 (groundwater monitoring well MW-NASB-067 was re-instated into the monitoring event program beginning with the April/May 2001 long-term monitoring event).

- Beginning in April 2002, it was agreed that the following sample analytical parameters for groundwater samples will be eliminated from the sampling program (see Technical Memorandum issued to MEDEP for reduction in long-term monitoring sample analysis at Building 95 on 2 April 2002 for rationale):

  — Target Compound List volatile organic compounds by EPA Method 8260B
  — Target Compound List semivolatile organic compounds by EPA Method 8270C
  — Target Analyte List metals by EPA Method 6000/7000 Series
  — Rotenone by EPA Method 635.

It was recommended by the Navy that, beginning with the September 2002 sampling event, maleic hydrazide by EPA Method 632 Modified be eliminated from the sampling program for groundwater samples collected at the Building 95 site (see Technical Memorandum issued to MEDEP for reduction in long-term monitoring sample analysis at Building 95 on 30 August 2002 for rationale). EPA concurred with the elimination of maleic hydrazide for the LTMP (U.S. EPA 2002), however, MEDEP did not agree with the Navy's request to eliminate maleic hydrazide from the Long-Term Monitoring Program (MEDEP 2002), therefore, samples were analyzed for maleic hydrazide during Monitoring Event 16.

1.3 MEASUREMENT OF WATER LEVEL ELEVATIONS

1.3.1 Gauging Activities

Water level measurements were obtained on 9 September 2002 at 6 groundwater monitoring wells located at the Building 95 site and at 12 monitoring wells at the Old Navy Fuel Farm. Monitoring wells included in the gauging program are summarized in Table 2. Well locations for Building 95 are provided on Figure 2. Well gauging methods are detailed in the Final LTMP (EA 2000). Previous monitoring well gauging events included monitoring well MW-NASB-054 (which was located in the nearby Old Navy Fuel Farm) to expand the boundary for groundwater contouring, however, well MW-NASB-054 was decommissioned in April 2001 during the Old Navy Fuel Farm well decommissioning program. Two additional monitoring wells (MW-NASB-062 and MW-NASB-209R) are included in the gauging program beginning with the October 2001 long-term monitoring event. For the September 2002 long-term monitoring event, all wells at the Old Navy Fuel Farm were gauged to better identify groundwater flow.

1.3.2 Results

Water level gauging data are summarized in Table 2. Figure 3 provides the interpreted direction of groundwater flow for the water elevation data collected on 9 September 2002.

1.4 GROUNDWATER MONITORING, SAMPLING, AND ANALYSIS

1.4.1 Sampling Activities

The groundwater sampling program was performed on 10 September 2002. Previously installed dedicated Grundfos Redi-Flo2 stainless steel and Teflon® submersible pumping systems were utilized for sample collection. Groundwater samples were collected from monitoring wells MWASB-067, MW-NASB-097, and MW-NASB-098 at Building 95 using the low-flow sampling technique, which is detailed in the Final LTMP (EA 2000).

Water quality indicator parameters, including pH, conductivity, temperature, dissolved oxygen, and turbidity, were monitored to ensure stabilization of water quality prior to sample collection (Table 3). Stabilization of water quality indicator parameters was considered achieved when measurements agreed to within approximately 10 percent on three successive readings. Turbidity readings at or below ±10 nephelometric turbidity units are considered stabilized. Although not required by the current Long-Term Monitoring Program, oxidation-reduction potential was also recorded for informational purposes. The monitoring wells reached equilibrium with respect to the water quality indicator parameters prior to sampling. The Field Record of Well Gauging, Purging, and Sampling forms completed during the sampling event are provided in Appendix E.

Groundwater samples were collected for analysis of the following: Target Compound List pesticides by EPA Method 8081A, and the pesticide maleic hydrazide by EPA Method 632 Modified (purged and sampled for on 18 September 2004 as noted on the field sampling forms).

1.4.2 Analytical Data

Appendix B Table B-1 provides a summary of analytical results for groundwater samples collected at the Building 95 site on 10 September 2002. Appendix G contains the Form I data summary tables for the analyses completed. Figure 2 provides the location of the monitoring wells.

1.5 VISUAL INSPECTION

Site inspection activities, as identified in the LTMP, were completed in accordance with the Final LTMP (EA 2000) on 10 September 2002. Inspection of the area confirmed no exposure of the geotextile marker fabric at the ground surface. Note that the geotextile marker fabric is not an impermeable barrier and was placed at the site to mark the extent of the previous soil excavations by ABB-ES so that if a future excavation(s) is needed, the previous excavation is delineated.

Five groundwater monitoring wells were found to be adequately labeled, capped, and locked. Monitoring well MW-NASB-097 was completed as a flush-mounted roadbox and has a bolted cover. There was no indication of vandalism of the site wells.

1.6 QUALITY ASSURANCE/QUALITY CONTROL

A rigorous quality assurance/quality control program is required by the Final LTMP (EA 2000) to meet the data quality objectives of the groundwater sampling program, as outlined in the Quality Assurance Project Plan contained in the Final LTMP (EA 2000). The data obtained during the September 2002 sampling event were determined to be of sufficient quality to be used to evaluate groundwater quality at the Building 95 site. Volatile organic compounds were not scheduled to be collected during this monitoring event, therefore, no quality control samples (i.e., trip blank), with the exception to 1 duplicate sample, were collected. The results of the duplicate sample are summarized in Table A-1.

1.7 ANALYTICAL DATA QUALITY REVIEW

As required by the Final LTMP (EA 2000), a review of laboratory data was performed on selected quality control parameters to evaluate precision, accuracy, completeness, comparability, and data quality objective requirements. A summary of the analytical data quality review is provided in Appendix D. Method detection limits for aqueous media are also included in Appendix D.

The data for sample MW-NASB-098 should be considered estimated due to the exceedance of the holding time criteria by 2 days (7 days to extraction) (Appendix D, Section D.2 Sample Holding Times provides further information). All sample results in Sample MW-NASB-097 are considered estimated due to low system monitoring compound recoveries (Appendix D, Section D.4 Accuracy, D.4.1 Pesticide Compounds provides further information). The recoveries of the above-mentioned sample may be due to matrix interference or poor laboratory technique. However, the analytical data are considered to be of sufficient quality to evaluate the long-term effectiveness of the removal action. If the surrogate recoveries were less than 10 percent, the data would be considered unusable, however, the surrogate recoveries were above 10 percent (65 percent). Based on this recovery, the data are considered estimated but are usable for evaluating the long-term effectiveness of the removal action.

2. TEMPORAL TRENDS AND OBSERVATIONS

2.1 WATER LEVEL GAUGING PROGRAM

The results of the groundwater level gauging program (Table 2) conducted during September 2002 indicate that the groundwater flow direction is generally toward the east-southeast (Figure 3). Based on the dominant flow patterns observed at the site, monitoring well MW-NASB-066 is located hydraulically upgradient of the former building locations, while the remainder of the site wells are located hydraulically downgradient or crossgradient of the former building locations.

In general, the hydraulic gradient across the Building 95 site is relatively flat. These results are consistent with previous gauging results.

2.2 GROUNDWATER MONITORING AND SAMPLING PROGRAM

2.2.1 Water Quality Parameters

Water quality parameters, including pH, conductivity, temperature, dissolved oxygen, and turbidity, were measured during well purging. Although not required by the final LTMP, oxidation-reduction potential was recorded for informational purposes.

2.2.2 Groundwater Sampling Results

A review of the temporal trends in groundwater conducted at Building 95 between 1995 and the present indicates the following (Appendix C for pesticide compounds trend graphs):

- **Monitoring Well MW-NASB-067**—Pesticide concentrations remained similar to results from the last monitoring event (not detected). No pesticides have been detected at this monitoring well location since June 2001.

- **Monitoring Well MW-NASB-097**—Pesticide concentrations for alpha-chlordane and heptachlor epoxide were detected above State Maximum Exposure Guidelines (0.27 and 0.04 µg/L, respectively) at 0.313 and 0.157 µg/L, respectively, during this monitoring event. Pesticide concentrations for 4,4'-dichlorodiphenyldichloroethlene, endosulfan I, and gamma-chlordane were detected below the State Maximum Exposure Guidelines at 0.162, 0.1JP, and 0.134 µg/L, respectively, during this monitoring event. Historically, pesticide concentrations range from not detected to approximately 0.75 µg/L. Sample results have been below corresponding Maximum Exposure Guidelines/Maximum Contaminant Levels since March 2000, with the following exceptions: alpha-chlordane noted during October 2001 and September 2002, and the exceedances of heptachlor epoxide in 5 of 6 samples collected between 2000 and 2002.

- **Monitoring Well MW-NASB-098**—Pesticide concentrations remained similar to results from the last monitoring event (not detected). No pesticides have been detected at this monitoring well location since the well was installed and first sampled in March 2000.

3. RECOMMENDATIONS

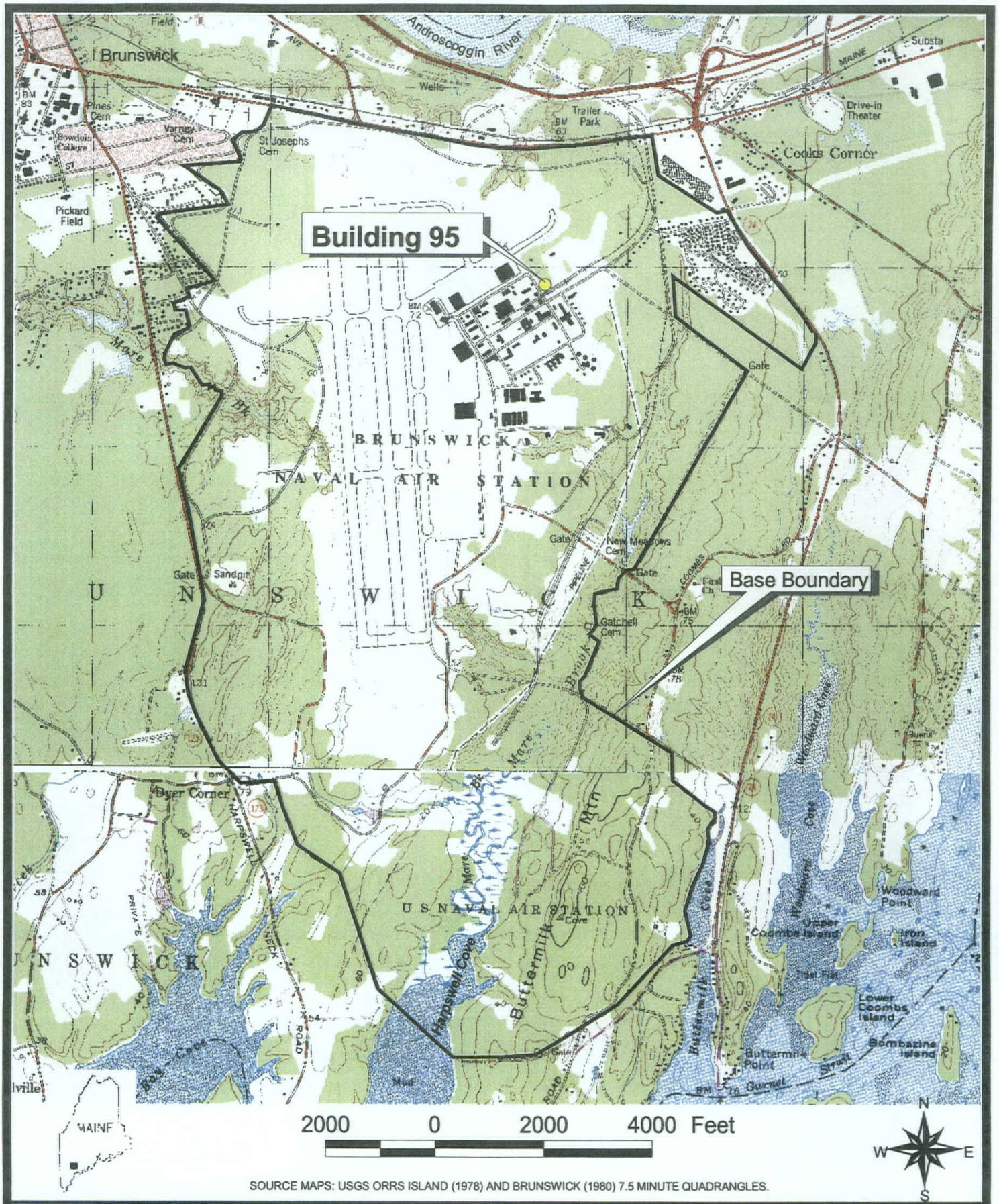
Based on an analysis of the data collected at Building 95 as part of the Long-Term Monitoring Program, the Navy recommended the following:

- Continue to perform long-term monitoring as necessary to provide additional data to identify groundwater trends and to assess the effectiveness of the 1994 soil removal actions at the site.

- Eliminate maleic hydrazide from the sampling program. This compound has not been detected at site monitoring wells during the October 2001, April 2002, or September 2002 sampling rounds. Therefore, it is recommended that this analytical parameter be eliminated from the sampling program as noted in a Technical Memorandum submitted to MEDEP and EPA on 30 August 2002.

- Revise the May 2000 LTMP to reflect changes to the analytical requirements at Building 95.

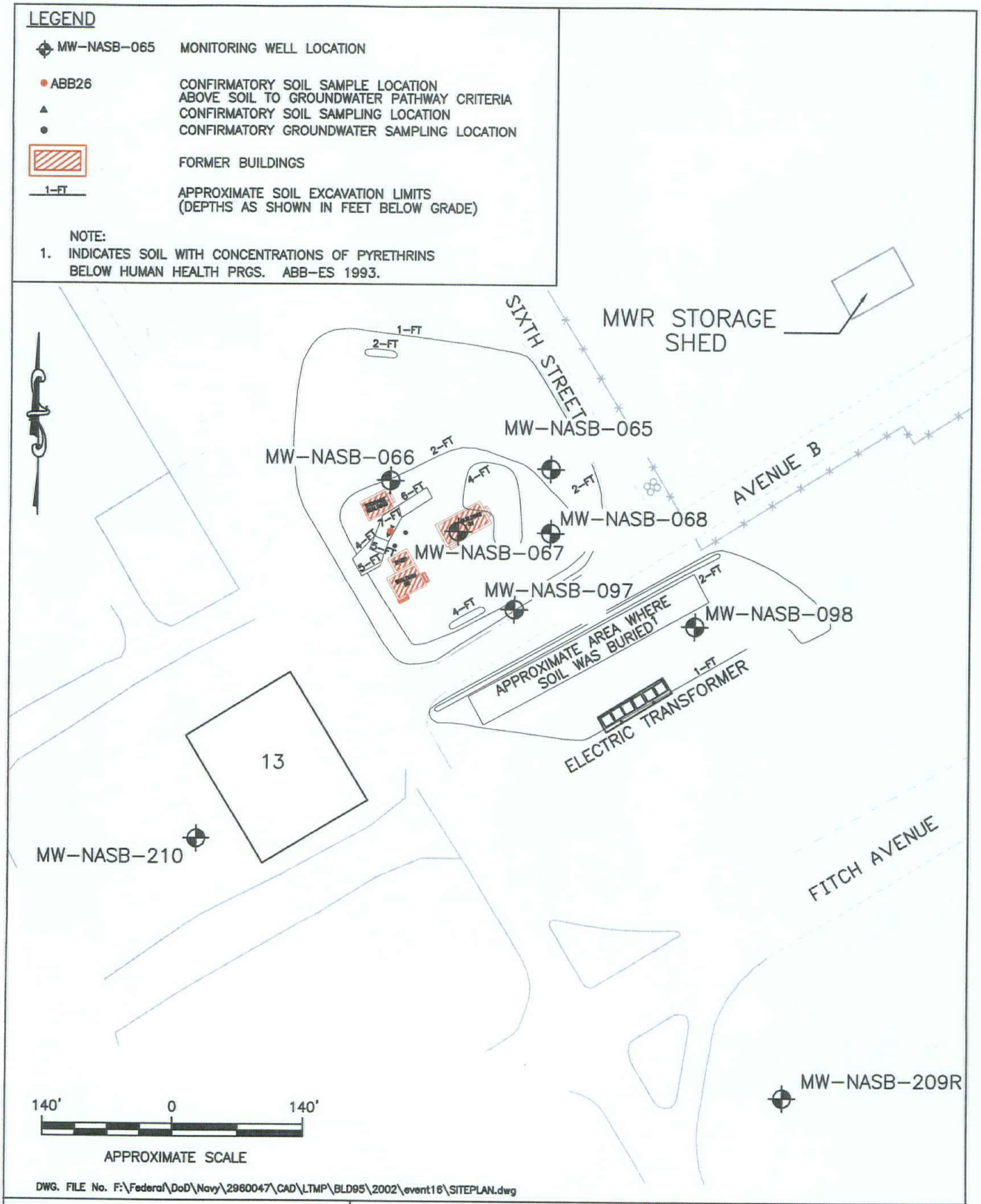
- Generate a consensus statement to document the history of the site, changes to the sampling program, and other important decisions which have affected the site monitoring history. The overall objective of the consensus statement will be to clarify the history of site decisions so this can be entered into the site Administrative Record.



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

EA®	NAVAL AIR STATION BRUNSWICK, MAINE	FIGURE 1 SITE LOCATION MAP BUILDING 95

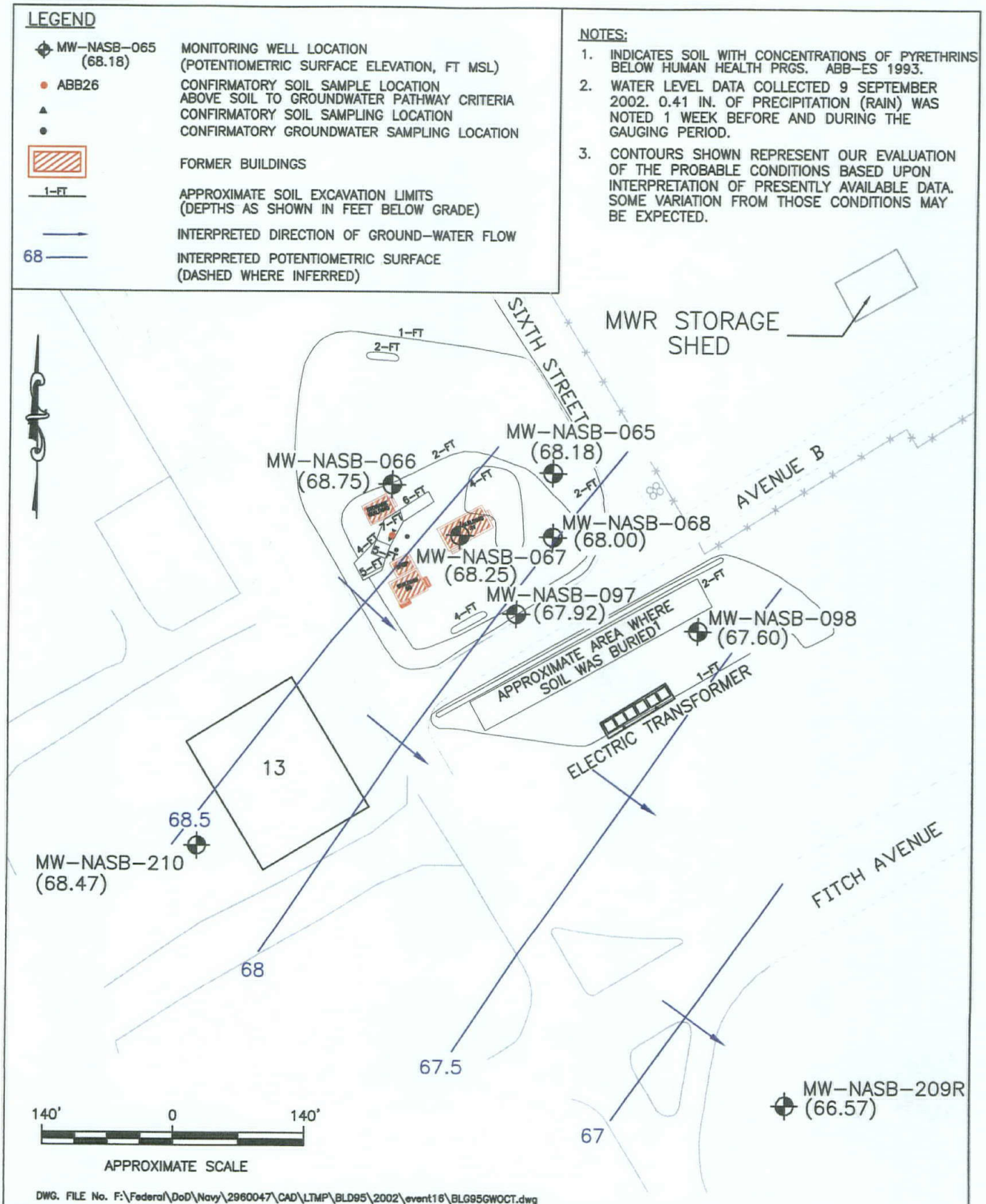
PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
ACE	DC	DC	PLN	AS SHOWN	26 AUGUST 2003	2960047	I:\NASB_GIS\NAVY.APR



DWG. FILE No. F:\Federal\DoD\Navy\2960047\CAD\LTMP\BLD95\2002\event16\SITEPLAN.dwg

EA®	BUILDING 95 NAVAL AIR STATION BRUNSWICK, MAINE	FIGURE 2 SITE PLAN

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FILE No.
AE	GMC/JG	JG	GMC	AS SHOWN	18 JULY 2003	29600.47	SITEPLAN



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BUILDING 95
NAVAL AIR STATION
BRUNSWICK, MAINE

FIGURE 3
INTERPRETED GROUNDWATER POTENTIOMETRIC SURFACE CONTOUR MAP, 9 SEPTEMBER 2002

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT NO	FILE No.
AE	GMC/JG	SAP	GMC	AS SHOWN	18 JULY 2003	29600.47	Blg95GWOCT

TABLE 1 SUMMARY OF THE LONG-TERM MONITORING PROGRAM AT BUILDING 95

Well Designation	Sample Parameters						
	Sampling Frequency[a]	Volatile Organic Compounds	Maleic Hydrazide	Avitrol	Target Compound List Pesticides	Bi-Annual Gauging	Field Parameters[b]
MW-NASB-065	Bi-Annual	NR	NR	NR	NR	X	NR
MW-NASB-066	Bi-Annual	NR	NR	NR	NR	X	NR
MW-NASB-067[c]	Bi-Annual	NR	X[d]	NR	X	X	X
MW-NASB-068	Bi-Annual	NR	NR	NR	NR	X	NR
MW-NASB-097	Bi-Annual	NR	X[d]	NR	X	X	X
MW-NASB-098	Bi-Annual	NR	X[d]	NR	X	X	X

(a) Bi-annual samples are collected in April and September of each year.
(b) 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 120.1), and turbidity (180.1); optional field parameters, including dissolved oxygen (Method 360.1) and Eh, were also recorded.
(c) Monitoring well MW-NASB-067 was added to the sampling program in April 2001.
(d) After a review of the data collected during the 2001 sampling events, it was decided that samples would be analyzed for pesticides, including maleic hydrazide.

NOTE: NR = Not required.

TABLE 2 MONITORING WELL GAUGING SUMMARY, BUILDING 95
9 SEPTEMBER 2002

Well Designation	Well Riser Elevation (ft MSL)	Depth to Well Bottom (ft below top of PVC well riser)	Monitoring Event 16 Gauging Data (9 September 2002)	
			Depth to Water (ft below top of PVC well riser)	Water Table Elevation (ft MSL)
Building 95[a]				
MW-NASB-065	74.29	15.50	6.11	68.18
MW-NASB-066	78.79	19.79	10.04	68.75
MW-NASB-067	74.30	15.00	6.05	68.25
MW-NASB-068	74.86	15.05	6.86	68.00
MW-NASB-097	73.41	11.05	5.49	67.92
MW-NASB-098	76.53	16.00	8.93	67.60
Old Navy Fuel Farm[b]				
MW-NASB-209R	72.94	10.00	6.37	66.57
MW-NASB-210	77.55	16.69	9.08	68.47

(a) These wells were gauged on 9 September 2002 and sampled on 10 September 2002.
(b) These wells are not part of the Building 95 Long-Term Monitoring Program but are gauged to provide additional data on local groundwater flow patterns.

NOTE: MSL = Mean sea level.
PVC = Polyvinyl chloride.

TABLE 3 SUMMARY OF WATER QUALITY INDICATOR PARAMETERS MEASURED IN GROUNDWATER SAMPLES COLLECTED ON 10 SEPTEMBER 2002 AT BUILDING 95

Well Designation	pH	Temperature (°C)	Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Eh (mV)
MW-NASB-067	5.74	21.90	230	0.28	2	44
MW-NASB-097	5.79	20.17	94	3.4	5	173
MW-NASB-098	5.89	22.02	158	0.92	40	69

NOTE: NTU = Nephelometric turbidity unit.

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 Easter Plume. August.

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

EA. 2000. Final Long-Term Monitoring Plan, Building 95, Naval Air Station, Brunswick, Maine. May.

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.

U.S. Environmental Protection Agency. 2002. Correspondence from Michael Barry to Department of the Navy concerning Building 95 Long-Term Monitoring Plan. 13 September.

Appendix A

Response to Comments from the Maine Department of Environmental Protection and U.S. Environmental Protection Agency on the Draft Report

FOLLOW-UP RESPONSE TO RESPONSE TO COMMENTS FROM THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ON THE DRAFT BUILDING 95, MONITORING EVENT 16 REPORT, SEPTEMBER 2002 AT THE NAVAL AIR STATION, BRUNSWICK, MAINE

Commentor: Claudia Sait	
Comment Issue Date: 17 September 2004	Navy Response Date: 24 September 2004

MEDEP has reviewed the Navy's response to comment for Building 95, Monitoring Event 16 Report – September 2002, dated 13 July 2004. In general, the responses are acceptable except for the two outlined below.

GENERAL COMMENT

1. ***MEDEP's Follow-Up Comment***—The four paragraphs that the Navy has agreed to add to Section 1.1 in these monitoring reports 16, 17, and 18 leaves out one important remedial action that occurred at Building 95. That is, the removal of pyrethrin-contaminated soil greater than 10,000 ppb, excavated from the Building 95 area, and buried immediately south of and paralleling Avenue B. The burial area is shown in Figure 3, but is not mentioned in the text. Please add a paragraph detailing what is known about the soil and its emplacement. (ED)

   Please be sure that this information is also included in Section 1.1 for Monitoring Event 17 and 18 Reports.

   Navy's Follow-Up Response—The following text has been added to Section 1.2 – Project Background as a new second paragraph.

   > *Contaminated soil above concentrations which exceed the Human Health Risk Assessment preliminary remediation goal was excavated and removed for disposal and clean soil was used as backfill. Some soil at concentrations below human health preliminary remediation goals and above ecological preliminary remediation goals was buried below the surface south of Avenue B. The extent of the excavation and burial areas is shown on Figure 3.*

SPECIFIC COMMENT

11. ***Navy's Response***—The following note has been added to Figures 2 and 3 regarding this area of the site map:

    "(1) Indicates soil with concentrations of DDT below Human Health PRGs. ABB-ES 1993."

    MEDEP's Follow-Up Comment—It is pyrethrins greater than 10,000 ppb, not DDT, that was the major contaminant the excavated soil. Please correct. (ED)

    Navy's Follow-Up Response—We agree with this comment. The notes on Figures 2 and 3 have been changed from "DDT" to "pyrethrins."

RESPONSE TO COMMENTS FROM THE MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION ON THE DRAFT BUILDING 95, MONITORING EVENT 16 REPORT, SEPTEMBER 2002 AT THE NAVAL AIR STATION, BRUNSWICK, MAINE

Commentor: Claudia Sait	
Comment Issue Date: 10 December 2003	**Navy Response Date: 13 July 2004**

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft report entitled Monitoring Event 16 – September 2002 for Building 95, dated October 2003, prepared by EA Engineering, Science, and Technology, Inc. Based on that review, MEDEP has the following comments and issues.

GENERAL COMMENTS

1. Since monitoring events are being used in place of an annual report, the understanding of the monitoring event reports relative to the initial site problem should be enhanced by inserting a paragraph or two into the Introduction that briefly relates what activities occurred at the site that caused contamination, and what corrective actions were taken (e.g. soil removal and monitoring well installation). (ED)

   Response—We agree with this comment. The following text has been added to Section 1.1:

   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 1993 (ABB-ES 1993). A Long-Term Monitoring Plan (LTMP) was established pursuant to the Record of Decision (ABB-ES 1994). The LTMP document establishes the requirements for monitoring/sampling to be conducted on a periodic basis. The Building 95 long-term monitoring well locations are summarized on Table 1.

   Building 95 and surrounding structures comprise 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'-dichlorodiphenyl-trichloroethane (DDT) and pyrethrins (an insecticide), in the soil and on structures at the site. Additionally, low concentrations of pesticides and inorganics were reported in groundwater samples (ABB-ES 1993).

   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 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 (ABB-26) reported concentrations of DDT above soil to

groundwater pathway criteria (ABB-ES 1998). The extent and depth of the excavated area is shown on Figure 2.

Groundwater samples were collected from monitoring wells MW-NASB-067, MW-NASB-097, and MW-NASB-098 (groundwater monitoring well MW-NASB-067 was re-instated into the monitoring event program beginning with the April/May 2001 long-term monitoring event).

2. It is noted that water levels were measured in "all wells at the Old Navy Fuel Farm ... to better identify groundwater flow." Data for 12 wells are given in Table 2, but Figure 3 (Interpreted Groundwater Potentiometric Surface Contour Map) only shows two of these wells. The other wells lie outside the figure boundaries. If any other well besides the two shown were used to interpret groundwater flow direction, the text should explain how this was done. If data from the other ten wells were not used to draw the contours, then the text needs to be revised and the information eliminated from Table 2. MEDEP believes that the best contouring will result by making use of most, or all, of the Old Fuel Farm monitoring wells. In this case, a figure should be presented in this report that shows the larger picture. (RR & ED)

Response—The contour map presented in Figure 3 was generated using the data from wells shown on this figure. This includes water elevation data from monitoring wells at Building 95 and two Old Navy Fuel Farm wells MW-NASB-209R and MW-NASB-210. Other well data have been removed from Table 2. Note that previous monitoring event reports (i.e., Monitoring Event 14) made use of additional wells in the Old Navy Fuel Farm. Addition of wells in the Old Navy Fuel Farm on the Building 95 contour map resulted in distortion of the localized flow field due to the small size of the Building 95 site and the relatively large distance to Fuel Farm wells. To more accurately reflect groundwater flow at the Building 95 site, only those wells in the immediate vicinity are included on the contour map.

SPECIFIC COMMENTS

3. ***Section 1.2, Project Background, Pages 1 and 2***

   a. Paragraphs 2-4 attempt to provide an overview of a complicated site history and changing monitoring program. MEDEP recommends the following in an attempt to provide a more fluent overview.

      - Delete the first sentence of Paragraph 3. (This information is in the record and doesn't provide any relevant information to a reader.)

        Response—We agree with this comment and the text has been changed as requested.

      - A ***brief*** description of the development of the first and second round analytes and the circumstances that triggered the initiation of the second round analytes would be helpful.

Response—The following text has been added to the beginning of Paragraph 4 (formerly Paragraph 3):

Discussions between the Navy and MEDEP regarding first round and second round analytes were established as noted below:

- *First round analytes included a broad list of analytes including those noted in historical records that may have been stored or used at the site. Second round analytes include a smaller list of compounds which are more likely to have been used at the site.*

- An overview of the reduction of both the frequency and the analyte list might be better accomplished with bulleted items. (ED)

Response—We agree with this comment. The text of Paragraph 4 (formerly Paragraph 3) has been broken into bullets to make the site timeline more comprehensible.

b. Paragraph 4 in particular is difficult to understand in that it discusses a recommendation beginning in September 2003 but then switches at the end to the reason maleic hydrazide was analyze for in Monitoring Event 16 (April 2002). Please re-read this paragraph and check the chronology before revising. (ED)

Response—There was a typographical error in this sentence. It should have noted the recommendation starting in September 2002 rather than September 2003. The rest of this sentence is accurate as written.

4. ***Section 1.5, Visual Inspection, Page 4***—"Inspection of the area confirmed no exposure of the geotextile marker fabric at the ground surface."

Within the written context of this report, the Navy should supply a brief explanation of the use of the geotextile so that a reader that is not familiar with the Building 95 site will understand this statement.

Response—The following text has been added to Section 1.5 after the above-mentioned sentence:

Note that the geotextile marker fabric is not an impermeable barrier and was placed at the site to mark the extent of the previous soil excavations by ABB-ES so that if a future excavation(s) is needed, the previous excavation is delineated.

5. ***Section 1.7, Analytical Data Quality Review, p. 4, 2nd Paragraph***—"All sample results in Sample MW-NASB-097 are considered estimated due to low system monitoring compound recoveries." "However, the analytical data are considered to be of sufficient quality to evaluate the long-term effectiveness of the removal action."

This paragraph should reference D.4 Accuracy, D.4.1 Pesticide Compounds beginning on Page 5 of Appendix D. Some estimated quantification of the error bar should be given in support of the second quoted sentence above. (ED)

Response—The following text has been added to Section 1.7:

The data for sample MW-NASB-098 should be considered estimated due to the exceedance of the holding time criteria by 2 days (7 days to extraction) (Appendix D, Section D.2 Sample Holding Times provides further information). All sample results in Sample MW-NASB-097 are considered estimated due to low system monitoring compound recoveries (Appendix D, Section D.4 Accuracy, D.4.1 Pesticide Compounds provides further information). The recoveries of the above-mentioned sample may be due to matrix interference or poor laboratory technique. However, the analytical data are considered to be of sufficient quality to evaluate the long-term effectiveness of the removal action. If the surrogate recoveries were less than 10 percent, the data would be considered unusable, however, the surrogate recoveries were above 10 percent (65 percent). Based on this recovery, the data are considered estimated but are usable for evaluating the long-term effectiveness of the removal action.

6. ***Section 2.2.2 Groundwater Sampling Results, Page 6, 1st Paragraph***—"Sample results have been below corresponding MEGs/MCLs since March 2000, with the exception of one exceedance of alpha-chlordane noted during October 2001 and the exceedances of both alpha-chlordane and heptachlor epoxide during September 2002."

This statement is not accurate. Figure 14 in Appendix C shows that all but one of the six sample results for heptachlor epoxide exceeds the MEG of 0.04 µg/L. Furthermore, September 2002 had the highest concentration. Please correct this paragraph. (ED)

Response—We agree with this comment. The text in Section 2.2.2 has been revised as noted:

Sample results have been below corresponding Maximum Exposure Guidelines/ Maximum Contaminant Levels since March 2000, with the following exceptions: the ~~one exceedance of~~ alpha-chlordane noted during October 2001 and September 2002, and the exceedances of ~~both alpha-chlordane and~~ heptachlor epoxide ~~during September 2002~~ in 5 of 6 samples collected between 2000 and 2002.

7. ***Section 2.2.2 Groundwater Sampling Results, Page 6, 2nd Paragraph***—"No pesticides have been detected at this monitoring well location since March 2000."

For clarity, please modify to read: "No pesticides have been detected at this monitoring well location since *the well was installed and first sampled in* March 2000."

Response—The text has been modified as suggested:

No pesticides have been detected at this monitoring well location since the well was installed and first sampled in March 2000.

8. ***Section 3, Recommendations, Page 7, Bullet 2***—Please re-read bullet 2. MEDEP recommends the following language: "~~Reduce the number of parameters for laboratory analysis to e~~Eliminate maleic hydrazide from the sampling program....

   Response—Bullet 2 in Section 3 on Page 7 has been re-written as follows:

   ~~*Reduce the number of parameters for laboratory analysis to e*~~*Eliminate maleic hydrazide from the sampling program. This compound....*

9. ***Section 3, Recommendations, Page 7, Bullet 3:***

   Please delete Bullet 3. It is very similar to the information provided in bullet 2 and the agreement to eliminate maleic hydrazide from Building 95 analyte list was not made until 16 September 2003, therefore it is inappropriate to include it in this report.

   Response—Bullet 3 in Section 3 on Page 7 has been deleted as follows:

   - ~~*"Based on the 30 August 2002 request, and subsequent discussions with MEDEP regarding elimination of maleic hydrazide from the Building 95 sampling program, MW-NASB-098 beginning with the April 2003 sampling event."*~~

10. ***Section 3, Recommendations, Page 7, Last Bullet***:—"Generate a consensus statement to document changes to the site to date."

    MEDEP believes that the Navy is proposing that a consensus statement would document the history of site, long-term monitoring decisions, regulatory decisions based on new data collected, and related activities, such as new well installations. Please clarify by adding information to this bullet.

    Response—The text of this bullet has been revised as follows:

    Generate a consensus statement to document the history of the site, changes to the sampling program, and other important decisions which have affected the site monitoring history. The overall objective of the consensus statement will be to clarify the history of site decisions so this can be entered into the site Administrative Record.

11. ***Figure 2, Site Plan***:

    a. This figure shows the area and depths of soil excavation, and where soil was buried. The figure legend and report text provides no further details, thus, it is assumed that the reader has read earlier background reports. The legend should make it clear what soil (origin) was buried where indicated on the figure, and provide reference to the appropriate remedial action report. (ED)

Response—The following note has been added to Figures 2 and 3 regarding this area of the site map:

(1) Indicates soil with concentrations of DDT below Human Health PRGs. ABB-ES 1993.

b. Also, the depth-of-excavation contours are very faint on the MEDEP copies, and are difficult to read. Please strengthen these line weights. (ED)

Response—Comment noted. The depth-of-excavation contours have been strengthened in the figure.

12. ***Appendix E.2, Field Record of Well Gauging, Purging, and Sampling Forms***

a. These field forms are incompletely filled out and/or displayed in places. For example, on one sheet there is no entry under "Sample Personnel" (MW-NASB-067 for September 10), and on the field forms for November 11, 2002 for late collection of maleic hydrazide (which is not explained in the text) the report pages are missing the "Sample Personnel" line. The missing information is potentially significant in the case of MW-NAB-067, as the following appears under comments: "strong chemical odor in purge water". The September 10, 2002 sampling field record sheet for MW-NASB-067 makes no mention of odors at this well. Were different people doing the sampling? This difference is even more intriguing because the earlier data weather note says "sunny hot humid" while the later data weather note says "cloudy, windy, warm, humid." The odor detected in November could have also been present in September, and in September, conditions were more conducive to detection. Recall that MW-NASB-067 is located next to the area of deepest soil excavation, close to the source area hot spot. A number of SVOCs were documented at this location in the 1990s. Please correct the reporting deficiencies, and comment on the odor observation. (RR & ED)

Response—We do not agree that significant omissions are present in the field forms. The blank entry noted in this comment (i.e., field personnel present at the time of sampling) was not completed on one field form, and is a relatively minor omission. The same field personnel were present during sampling of the other wells at Building 95 (Marc Carver) as is noted on other well forms. The field team simply noted that an odor was present. The laboratory analysis for site groundwater is the best way to provide an explanation for whether this odor is caused by possible contaminants (which have not been detected), or whether other factors may be responsible. No definitive answer can be provided although it seems possible that the negative ORP values noted at the time of sampling could explain the odor as inorganics and other groundwater constituents may oxidize upon reaching ambient environmental conditions.

b. Also, please explain what the 18 September comments refer to in the lower right corner of the field sheets for MW-NASB-067, MW-NASB-097 and MW-NASB-098. (RR)

Response—This note is related to the purging and sampling for maleic hydrazine which was completed on 18 September. Due to the ongoing discussions being held with MEDEP regarding the need for maleic hydrazide analysis, this sampling was completed 1 week after pesticide sampling. A note summarizing this has been added to Section 1.4.1, Sampling Activities.

williams.christine@epamail.epa.gov

10/07/2004 06:56 AM

To: mark.krivansky@navy.mil
cc: orlando.monaco@navy.mil, aeasterd@eaest.com, claudia.b.sait@maine.gov, clepagegeo@aol.com
Subject: Brunswick NAS bldg 95 MEs

EPA agrees with the MeDEP comments on Bldg 95 MEs 16&18. EPA has no additional comments.

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Appendix B

Laboratory Analytical Data Summary Table

TABLE B-1 SUMMARY OF GROUNDWATER SAMPLES COLLECTED FROM BUILDING 95 ON 10 SEPTEMBER 2002
PESTICIDES BY U.S. ENVIRONMENTAL PROTECTION AGENCY METHOD 8081A

			MW-NASB-067	MW-NASB-097	MW-NASB-098	MW-NASB-098 (Dup)
			Groundwater	Groundwater	Groundwater	Groundwater
			Low-Flow Sample	Low-Flow Sample	Low-Flow Sample	Low-Flow Sample
Compound/Element	**MEG (a)**	**MCL (b)**				
4,4'-DDD	NC	NC	(<0.1U)	0.162	(<0.101U)	(<0.101U)
4,4'-DDE	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
4,4'-DDT	0.83	NC	(<0.1U)	(<0.204U)	(<0.101U)	(<0.101U)
Aldrin	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
alpha-BHC	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
alpha-Chlordane	0.27	NC	(<0.1U)	**0.313**	(<0.101U)	(<0.101U)
beta-BHC	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
delta-BHC	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
Dieldrin	0.02	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
Endosulfan I	NC	NC	(<0.1U)	0.1JP	(<0.101U)	(<0.101U)
Endosulfan II	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
Endosulfan Sulfate	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
Endrin	2	2	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
Endrin Aldehyde	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
Endrin Ketone	NC	NC	(<0.1U)	(<0.102U)	(<0.101U)	(<0.101U)
gamma-BHC (Lindane)	NC	NC	(<0.2U)	(<0.102U)	(<0.202U)	(<0.202U)
gamma-Chlordane	NC	NC	(<5U)	0.134	(<5.05U)	(<5.05U)
Heptachlor	0.08	4	(<0.101U)	(<0.102U)	(<0.101U)	(<0.101U)
Heptachlor Epoxide	0.04	2	(<0.101U)	**0.157**	(<0.101U)	(<0.101U)
Maleic Hydrazide	NC	NC	(<4U)	(<4U)	(<4U)	(<4U)
Methoxychlor	100	40	(<0.202U)	(<0.2U)	(<0.202U)	(<0.202U)
Toxaphene	0.3	3	(<0.101U)	(<5.1U)	(<0.101U)	(<5.05U)

(a) MEG (Maximum Exposure Guideline) obtained from State of Maine Department of Human Services Maximum Exposure Guidelines, memorandum dated 23 October 1992.
(b) MCL (Maximum Contaminant Level) obtained from 40 CFR Parts 141 and 142 (U.S. EPA 1998).

NOTE:
NC = Criteria not applicable.
Units are micrograms per liter (µg/L).
(Dup) indicates duplicate sample.
U = Not detected. Sample quantitation limits are shown as (<____U).
J = Estimated concentration.
P = Difference between primary and confirmatory results exceeds 40%.
Refer to Data Quality Review section (Appendix C) for Method Detection Limits for referenced analytical methods.
Concentrations highlighted with gray and bold type denote exceedance of MEG or MCL.

Appendix C

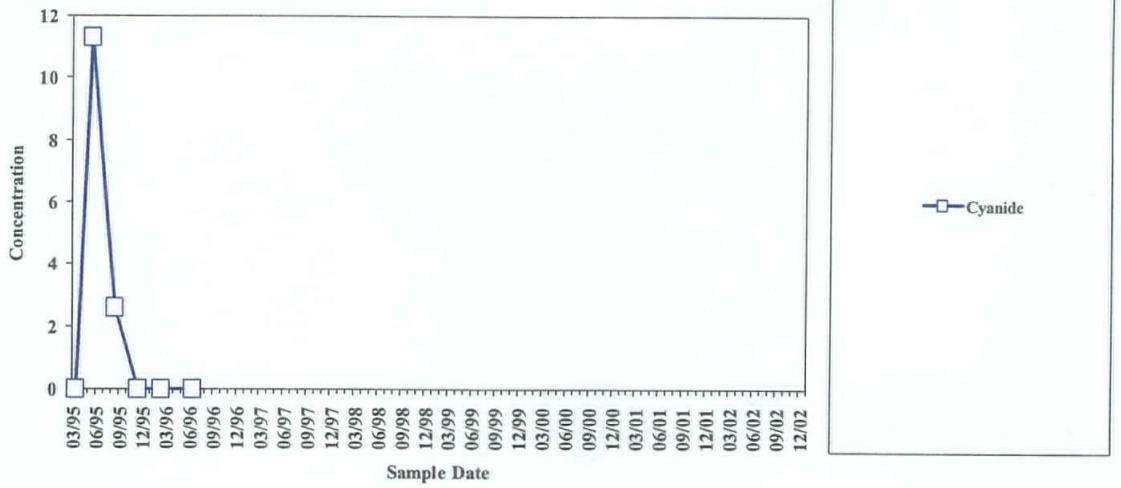
Temporal Trend Graphs

Sample Location:

MW-NASB-065

Building 95
Groundwater

Contaminants of Concern Inorganics



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

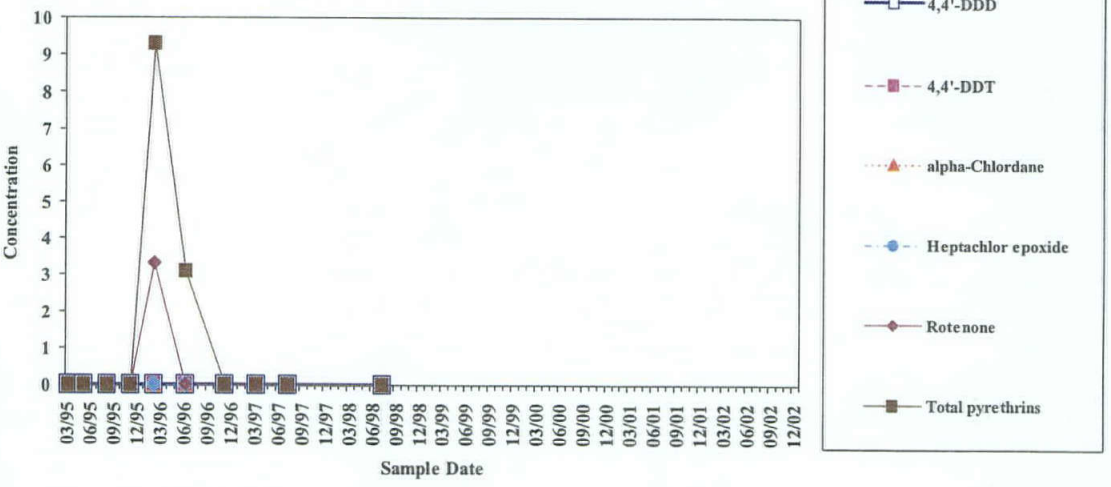
Sample concentration units: mg/L

Sample Location:

MW-NASB-065

Building 95
Groundwater

Contaminants of Concern Pesticides



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: µg/L

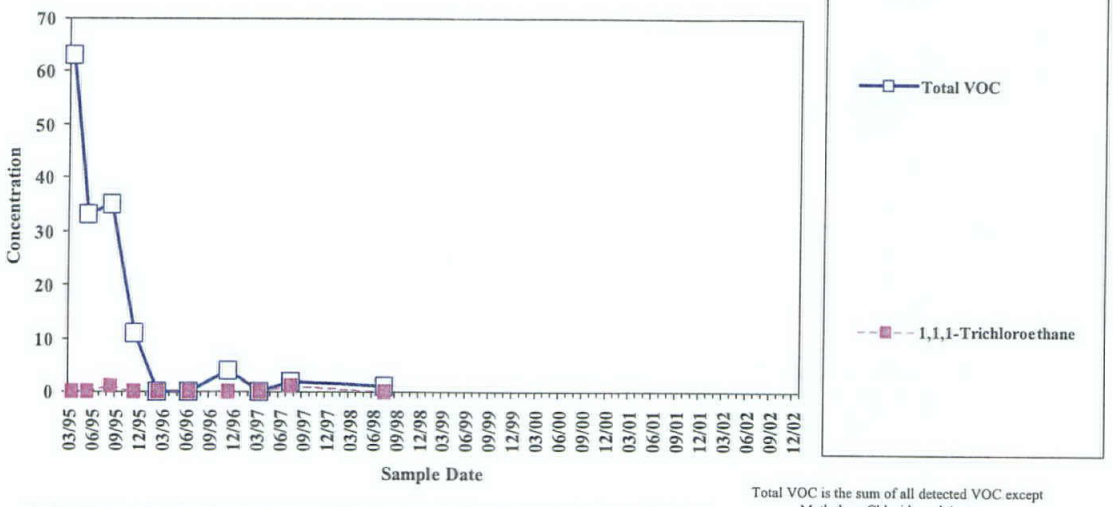
4,4'-DDD		4,4'-DDT		alpha-Chlordane		Heptachlor Epoxide		Rotenone		Total pyrethrins	
MEG:	-	MEG:	0.83	MEG:	0.27	MEG:	0.04	MEG:	4	MEG:	-
MCL:	-	MCL:	-	MCL:	-	MCL:	2	MCL:	-	MCL:	-

Sample Location:

MW-NASB-065

Building 95
Groundwater

Contaminants of Concern Volatiles



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Total VOC is the sum of all detected VOC except Methylene Chloride and Acetone.

Sample concentration units: µg/L

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

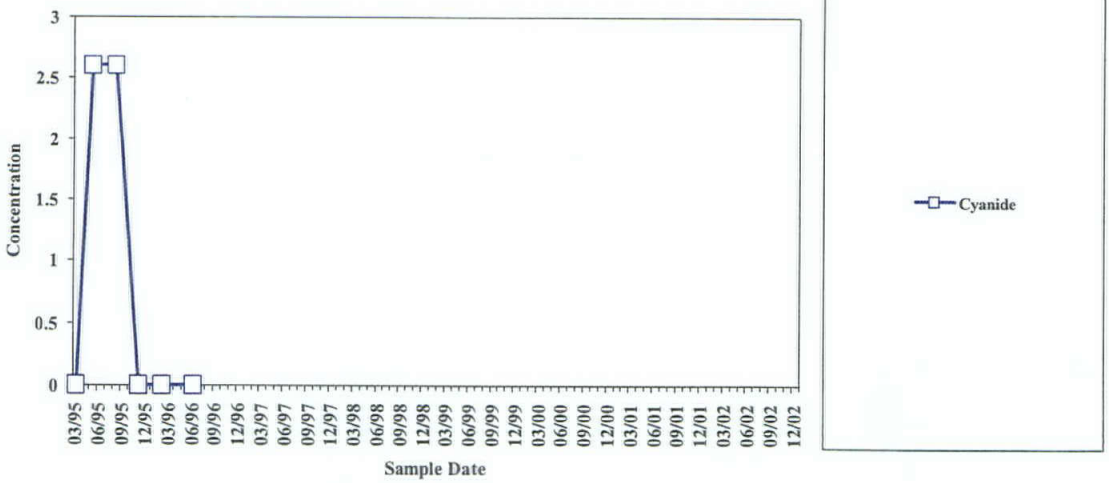
Figure 3 of 18

Sample Location:

MW-NASB-066

Building 95
Groundwater

Contaminants of Concern Inorganics



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: mg/L

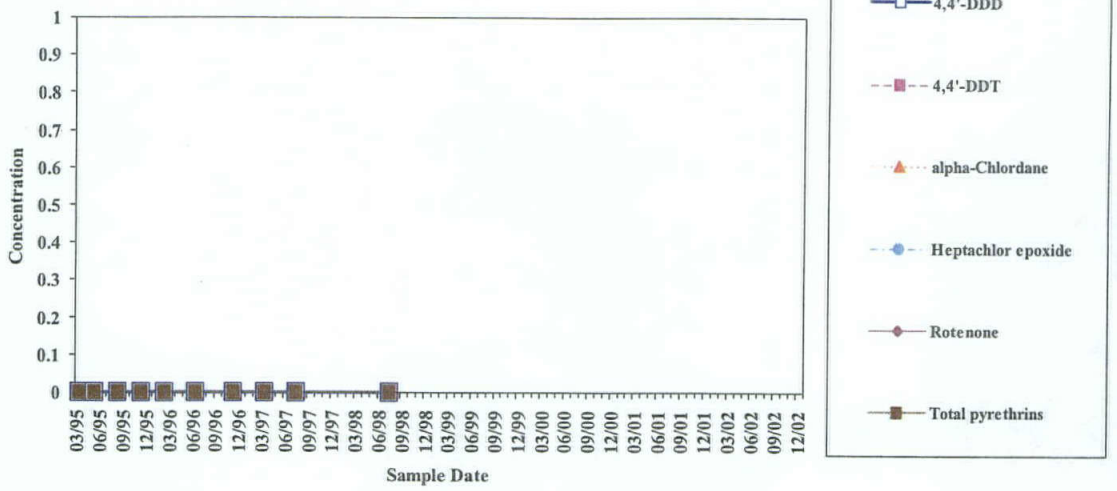
Figure 4 of 18

Sample Location:

MW-NASB-066

Building 95
Groundwater

Contaminants of Concern Pesticides



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: µg/L

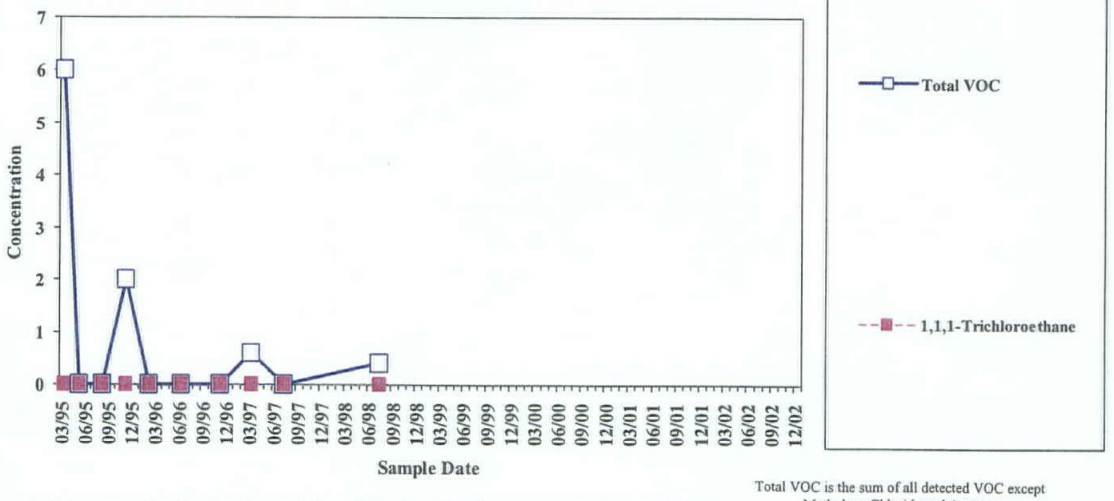
4,4'-DDD		4,4'-DDT		alpha-Chlordane		Heptachlor Epoxide		Rotenone		Total pyrethrins	
MEG:	-	MEG:	0.83	MEG:	0.27	MEG:	0.04	MEG:	4	MEG:	-
MCL:	-	MCL:	-	MCL:	-	MCL:	2	MCL:	-	MCL:	-

Sample Location:

MW-NASB-066

Building 95
Groundwater

Contaminants of Concern Volatiles



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Total VOC is the sum of all detected VOC except Methylene Chloride and Acetone.

Sample concentration units: µg/L

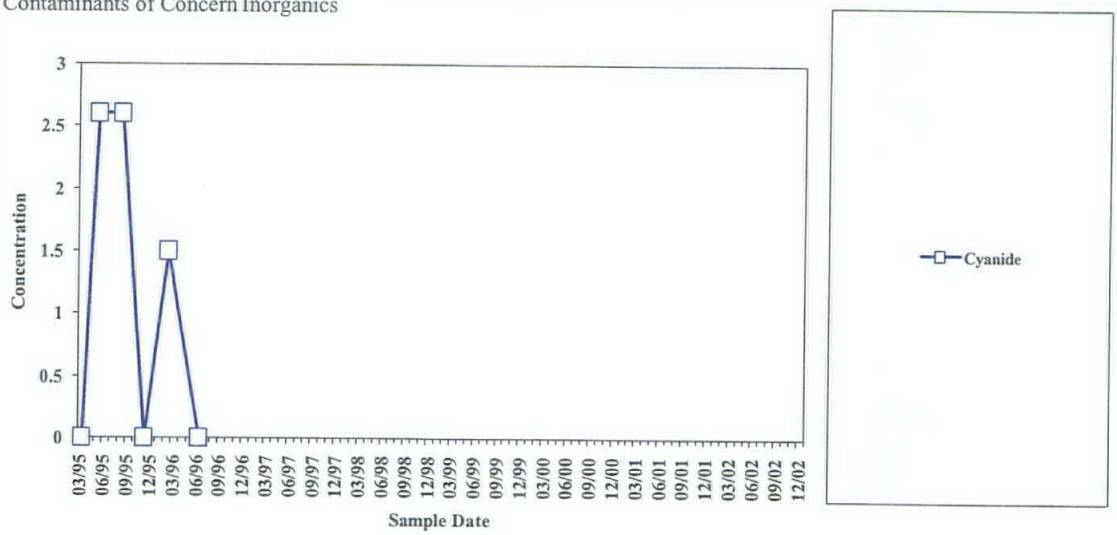
1,1,1-Trichloroethane	
MEG:	200
MCL:	200

Sample Location:

MW-NASB-067

Building 95
Groundwater

Contaminants of Concern Inorganics



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

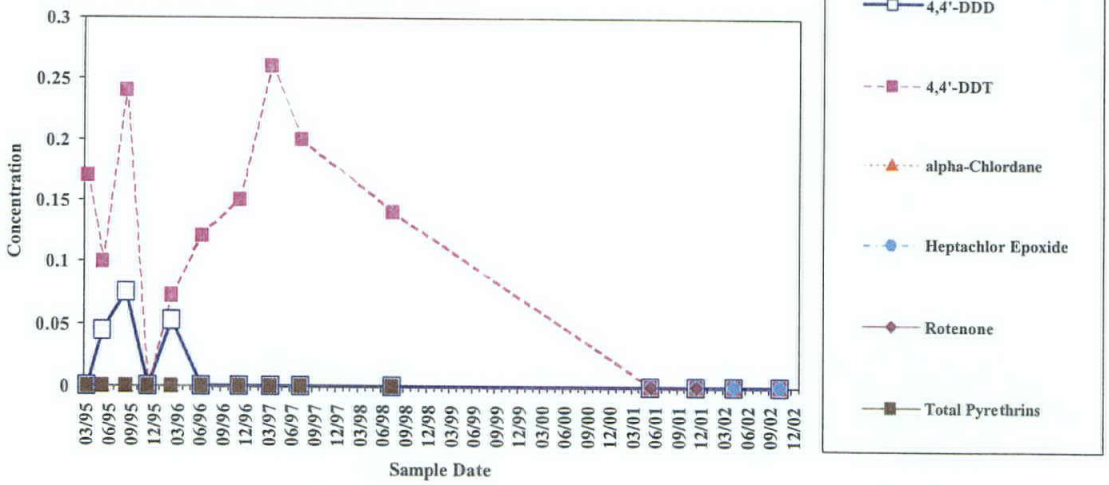
Sample concentration units: mg/L

Sample Location:

MW-NASB-067

Building 95
Groundwater

Contaminants of Concern Pesticides



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: µg/L

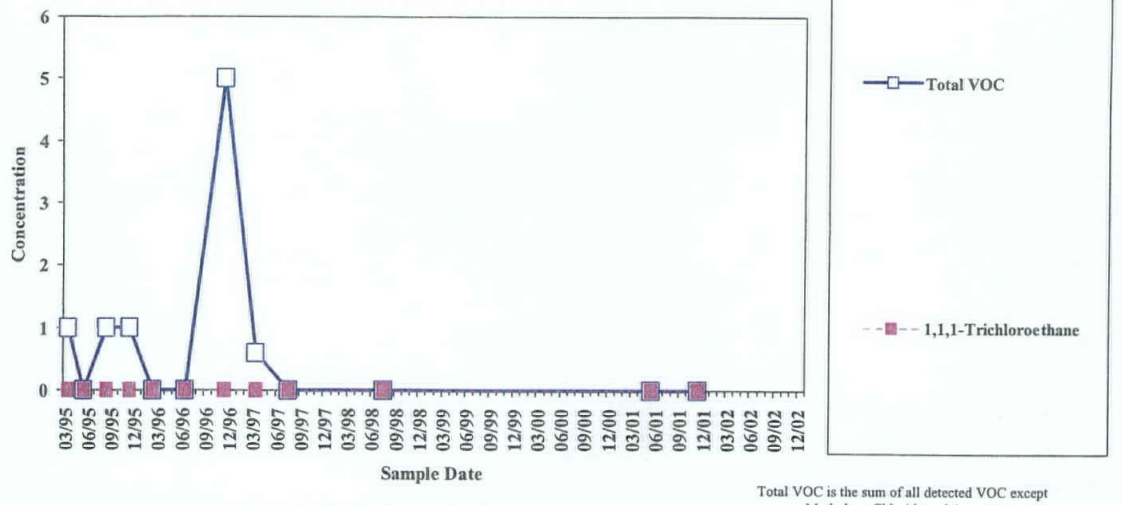
4,4'-DDD		4,4'-DDT		alpha-Chlordane		Heptachlor Epoxide		Rotenone		Total pyrethrins	
MEG:	-	MEG:	0.83	MEG:	0.27	MEG:	0.04	MEG:	4	MEG:	-
MCL:	-	MCL:	-	MCL:	-	MCL:	2	MCL:	-	MCL:	-

Sample Location:

MW-NASB-067

Building 95
Groundwater

Contaminants of Concern Volatiles



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Total VOC is the sum of all detected VOC except Methylene Chloride and Acetone.

Sample concentration units: µg/L

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

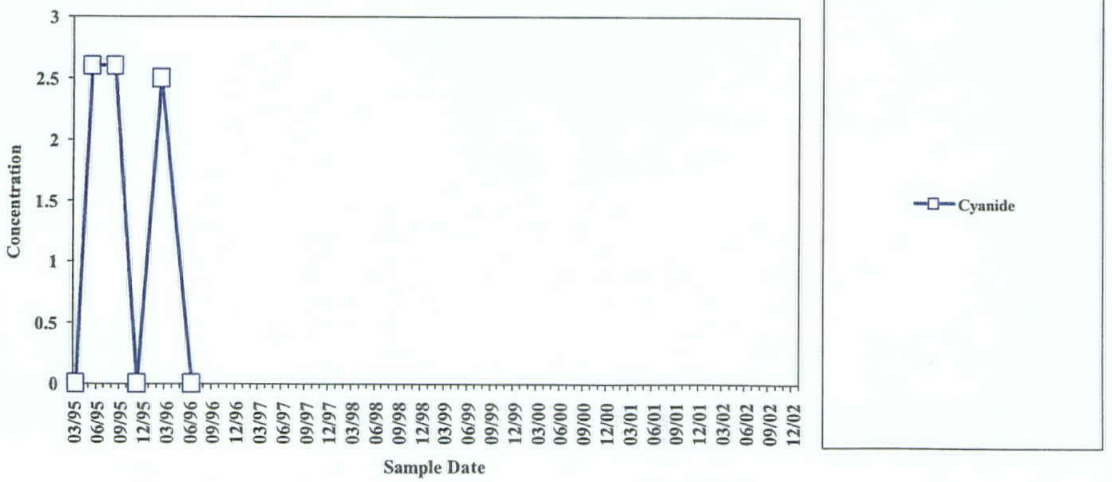
Figure 9 of 18

Sample Location:

MW-NASB-068

Building 95
Groundwater

Contaminants of Concern Inorganics



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: mg/L

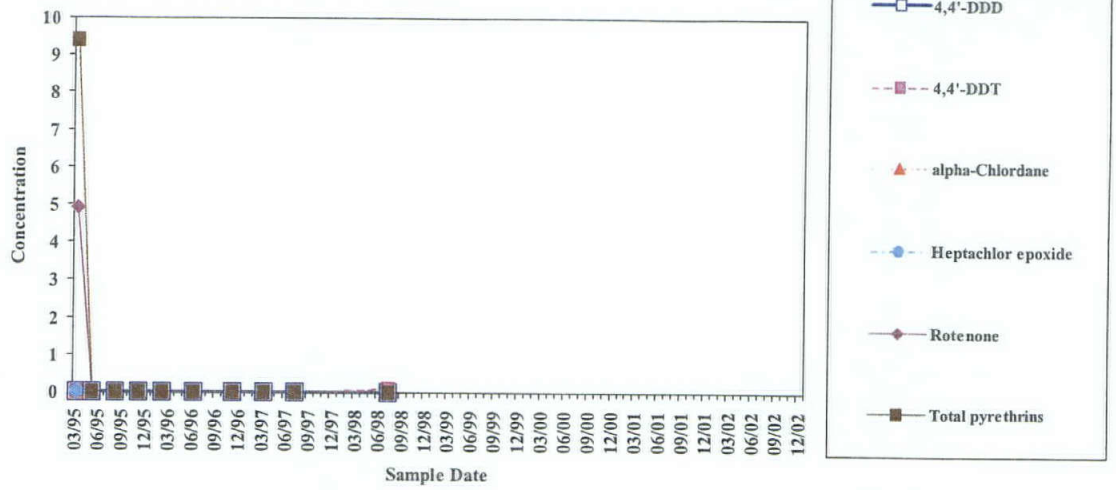
Figure 10 of 18

Sample Location:

MW-NASB-068

Building 95
Groundwater

Contaminants of Concern Pesticides



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: µg/L

4,4'-DDD		4,4'-DDT		alpha-Chlordane		Heptachlor Epoxide		Rotenone		Total pyrethrins	
MEG:	-	MEG:	0.83	MEG:	0.27	MEG:	0.04	MEG:	4	MEG:	-
MCL:	-	MCL:	-	MCL:	-	MCL:	2	MCL:	-	MCL:	-

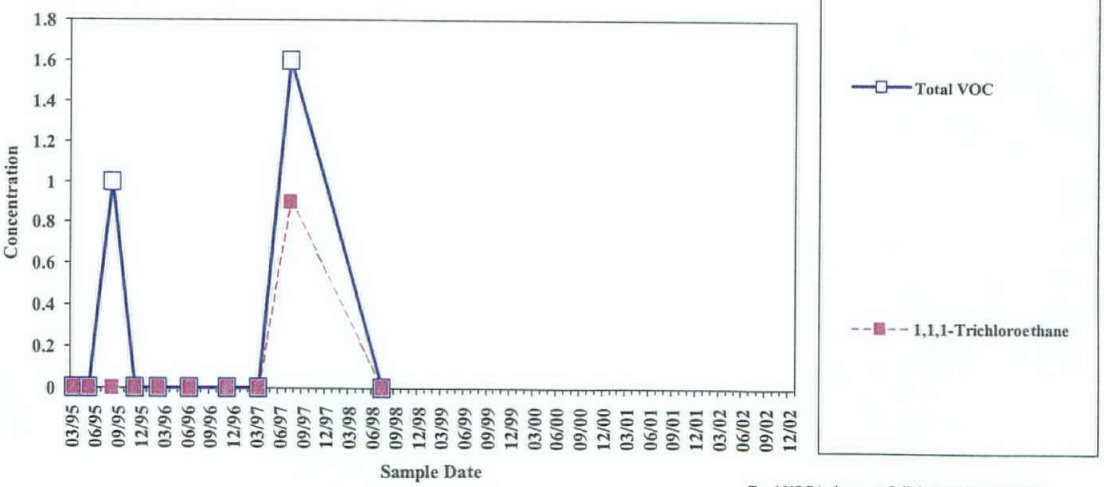
Figure 11 of 18

Sample Location:

MW-NASB-068

Building 95
Groundwater

Contaminants of Concern Volatiles



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Total VOC is the sum of all detected VOC except Methylene Chloride and Acetone.

Sample concentration units: µg/L

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

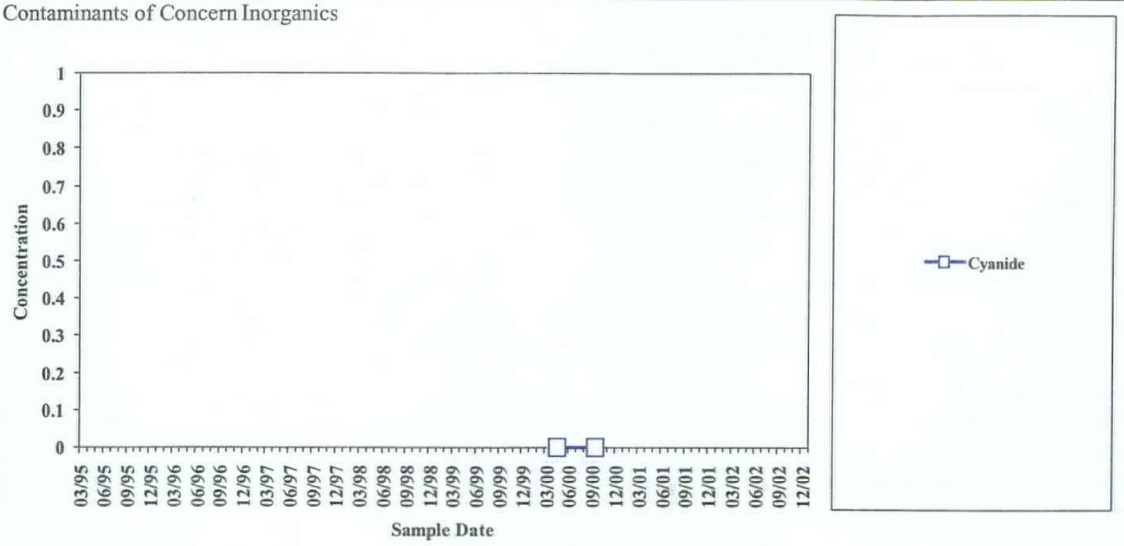
Figure 12 of 18

Sample Location:

MW-NASB-097

Building 95
Groundwater

Contaminants of Concern Inorganics



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

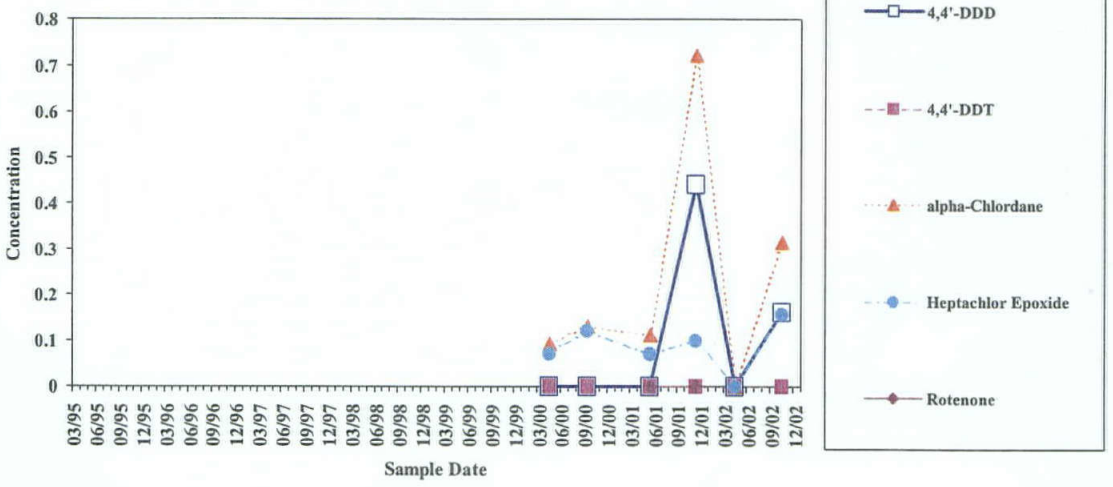
Sample concentration units: µg/L

Sample Location:

MW-NASB-097

Building 95
Groundwater

Contaminants of Concern Pesticides



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: µg/L

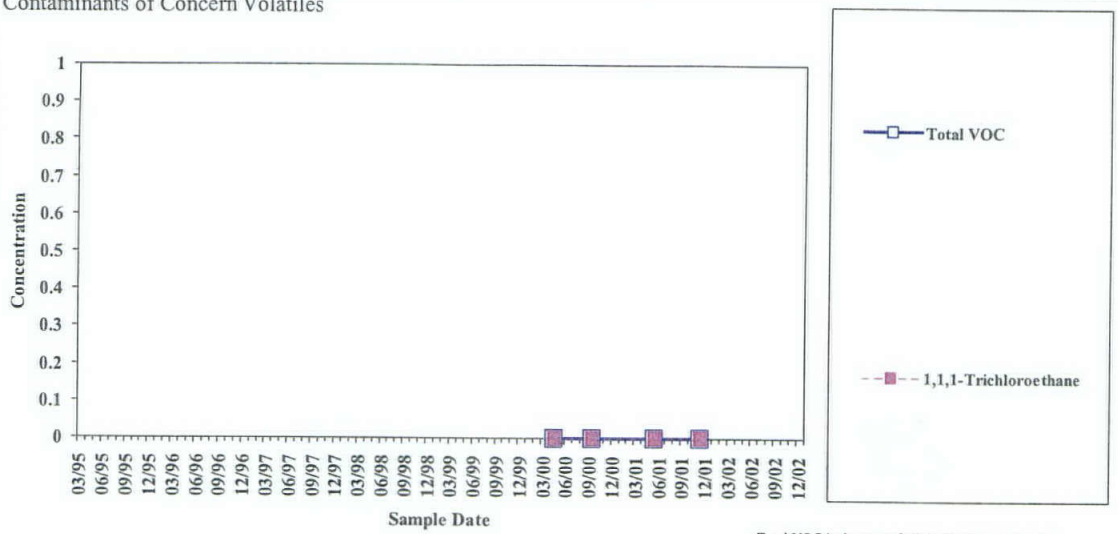
4,4'-DDD		4,4'-DDT		alpha-Chlordane		Heptachlor Epoxide		Rotenone		Total pyrethrins	
MEG:	-	MEG:	0.83	MEG:	0.27	MEG:	0.04	MEG:	4	MEG:	-
MCL:	-	MCL:	-	MCL:	-	MCL:	2	MCL:	-	MCL:	-

Sample Location:

MW-NASB-097

Building 95
Groundwater

Contaminants of Concern Volatiles



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Total VOC is the sum of all detected VOC except Methylene Chloride and Acetone.

Sample concentration units: µg/L

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

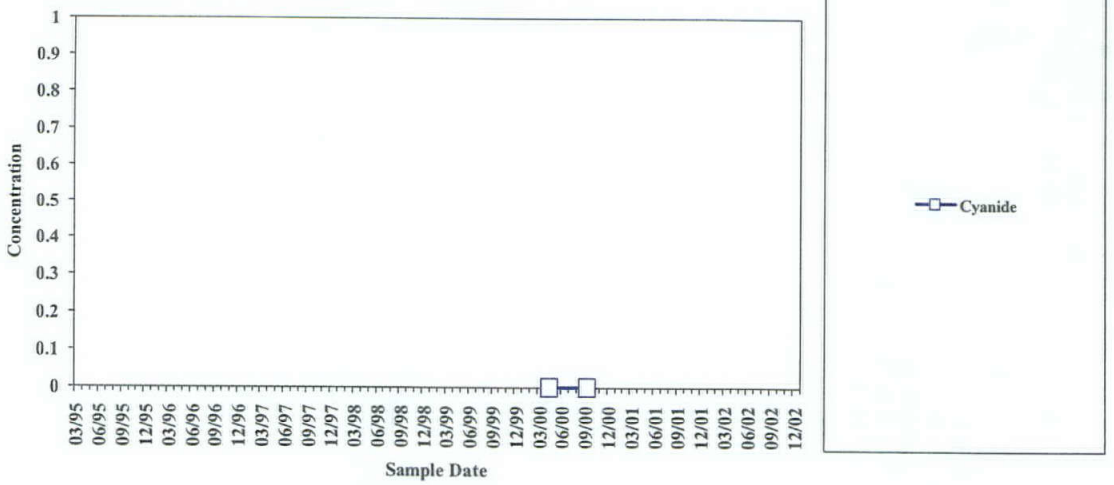
Figure 15 of 18

Sample Location:

MW-NASB-098

Building 95
Groundwater

Contaminants of Concern Inorganics



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: µg/L

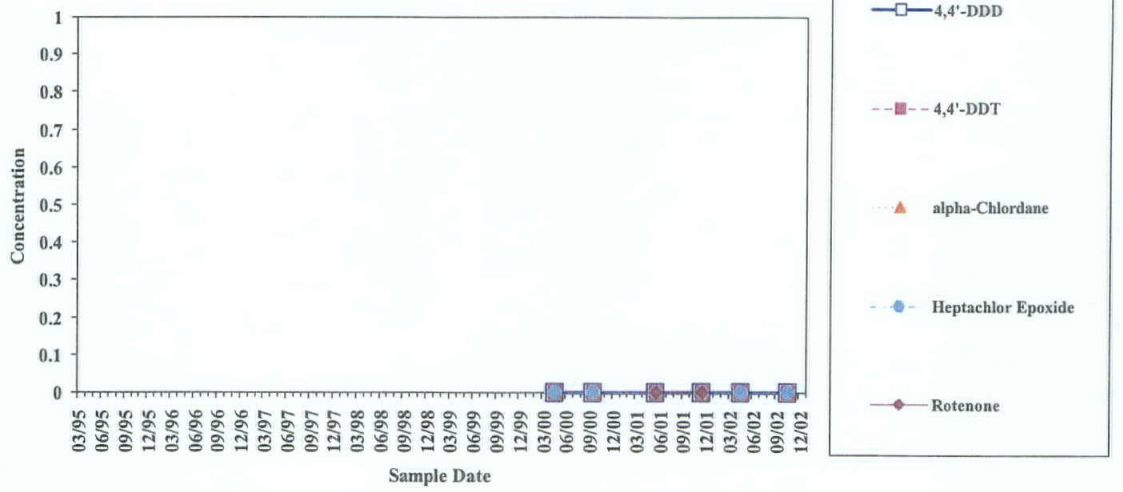
Figure 16 of 18

Sample Location:

MW-NASB-098

Building 95
Groundwater

Contaminants of Concern Pesticides



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Sample concentration units: µg/L

4,4'-DDD		4,4'-DDT		alpha-Chlordane		Heptachlor Epoxide		Rotenone		Total pyrethrins	
MEG:	-	MEG:	0.83	MEG:	0.27	MEG:	0.04	MEG:	4	MEG:	-
MCL:	-	MCL:	-	MCL:	-	MCL:	2	MCL:	-	MCL:	-

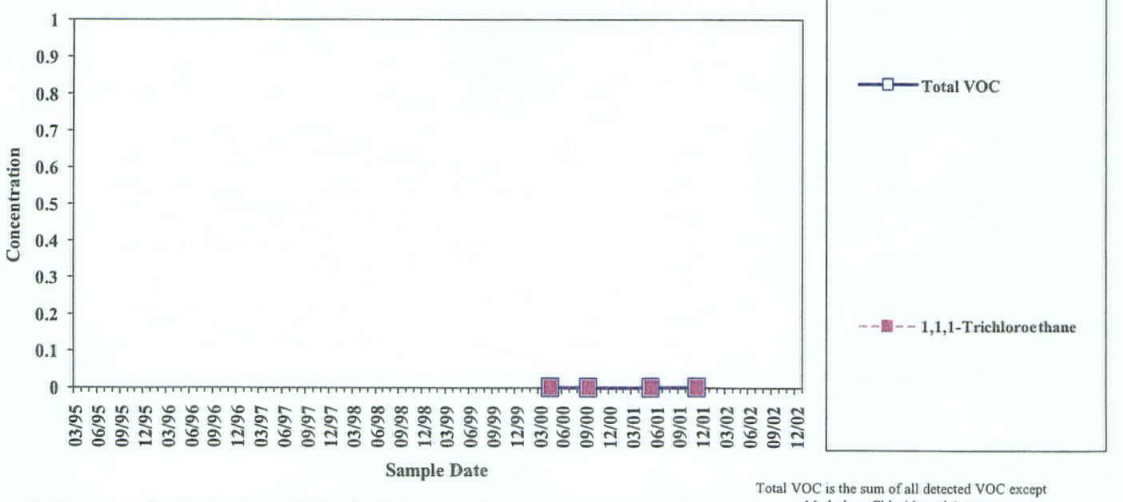
Figure 17 of 18

Sample Location:

MW-NASB-098

Building 95
Groundwater

Contaminants of Concern Volatiles



Analyte concentrations less than the sample detection limit are plotted as zero concentration on this chart.

Total VOC is the sum of all detected VOC except Methylene Chloride and Acetone.

Sample concentration units: µg/L

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

Figure 18 of 18

Appendix D

Analytical Data Quality Review

D.1 Method Detection Limits for Sediment and Aqueous Samples

APPENDIX D – CONTENTS

APPENDIX D

ANALYTICAL DATA QUALITY REVIEW

D.1 INTRODUCTION

This project utilized both field and analytical laboratory quality control measures to ensure that the data quality objectives presented in the project-specific Quality Assurance Project Plan (QAPP) (EA 2000)[1] were met.

The sampling program consisted of four aqueous samples collected from the Building 95 site, which were provided to Pacific Agriculture Laboratory (for maleic hydrazide analysis) and ESS Laboratory (for pesticides analysis) as 1 sample delivery group. Samples included 3 monitoring wells and 1 field duplicate. Field quality control samples (field duplicate) were collected at the frequency required by the QAPP. Equipment rinsate blanks were not required due to the use of dedicated pumping systems. Trip blanks were not required since the samples were not being analyzed for volatile organic compounds.

Analytical quality control was reviewed for compliance against the data quality objectives for precision and accuracy for each sample and analysis type, including field quality control blanks (i.e., trip blanks) and field sample duplication as presented in the QAPP. Additional sample volume was provided to the laboratory to ensure that the quality control parameters could be preformed. Analytical precision was based upon the mean relative percent difference (RPD) of the matrix spike/matrix spike duplicates (MS/MSD) for organic analysis and the RPD of the laboratory duplicates for inorganic analysis. Accuracy was based upon the reported spike recoveries for the laboratory control standards (LCS), MS/MSD, and system monitoring compound (SMC) recoveries (for organic analysis only).

The ability of the laboratory to extract compounds is confirmed by the recoveries of the LCS. MS/MSD and SMC 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. SMCs, which are structurally similar to the targeted analytes, are used to evaluate the recovery of the target compounds. These are then used as indicators for all of the analytes. The accuracy of the LCS spike recoveries is used in conjunction with MS/MSD when evaluating organic analyses.

1. EA Engineering, Science, and Technology. 2000. Final Long-Term Monitoring Plan (including Quality Assurance Project Plan), Building 95, Naval Air Station, Brunswick, Maine. May.

Field completeness was quantified by reviewing the scheduled number of samples to the number of samples actually collected. Data completeness was quantified by reviewing the number of usable results to the number of analyses scheduled for analysis.

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

- ***Instrument Detection Limit***—Defined as the lowest concentration that can be determined to be statistically different from instrument background noise (also known as an instrument blank).

- ***Method Detection Limit***—Refers to the minimum concentration that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero and is determined from analysis of a sample for a given matrix. The method detection limits for aqueous media are summarized in Appendix D.1.

- ***Contract Required Detection Limit/Contract Required Quantitation Limit***—Refers to the minimum level of detection acceptable under the contract Statement of Work in order to ensure regulatory compliance. This terminology is widely accepted in the industry as defined by the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program protocols and is a standard list of inorganic analyte concentrations and organic compound concentrations on which laboratory flags and data validation qualifiers are based. These published concentrations are meant to be above the laboratory instrument detection limits in order to ensure a level of confidence. The published Contract Required Detection Limits/Contract Required Quantitation Limits are specific to the Contract Laboratory Program methodology but are often used throughout industry methods. The data user should be aware that stated Contract Required Detection Limits/Contract Required Quantitation Limits are generic for a method and are affected for each sample by sample volume, concentration, percent solids, and dilution factors.

- ***Practical Quantitation Limit***—Defined as the lowest concentration that can be reasonably achieved within specified units of precision and accuracy during routine laboratory operating conditions.

D.1.1 Precision

Precision is evaluated by comparing the RPD of the MS/MSD sample pairs to the laboratory-established RPD control limits. If the RPD is outside the quality control acceptance criteria, the positive detect or non-detect is estimated for the affected compound in the unspiked sample (U.S. EPA 1996)[2].

2. U.S. Environmental Protection Agency (EPA)–New England. 1996. Data Validation Functional Guidelines for Evaluating Environmental Analyses. Revised December.

D.1.2 Accuracy

Accuracy is evaluated by comparing MS/MSD recoveries, surrogate spike recoveries, and LCS recoveries to laboratory-established control limits.

D.1.2.1 Evaluating Matrix Spike/Matrix Spike Duplicate Recoveries for Accuracy

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

- If the spike recovery is greater than the upper control limit, then the positive detects are estimated 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, then the positive detects are estimated and the non-detects are estimated for the affected compounds in the unspiked sample.

- If the spike recovery is less than 10 percent, then the positive detects are estimated and the non-detects are rejected for the affected compounds in the unspiked sample.

D.1.2.2 Evaluating Surrogate Recoveries for Accuracy

- If the surrogate recovery is greater than the upper limit, the positive detects are estimated 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 lower control limit, then the positive detects are estimated and the non-detects are estimated.

- If the surrogate recovery is less than 10 percent, then the positive detects are estimated and the non-detects are rejected.

  NOTE: If a sample has more than one surrogate recovery out of the control limits and the laboratory fails to re-analyze the sample which is outside the control limits, then the sample data should be qualified according to the above-mentioned guidelines for surrogate recoveries. If the sample was re-analyzed and the same surrogate recovery problems exist, this confirms that the non-compliance was due to sample matrix effects rather than poor laboratory performance and no qualification is needed for the sample.

D.1.2.3 Evaluating Laboratory Control Sample Recoveries for Accuracy

- If the LCS recovery is greater than upper control limit, the positive detects are estimated 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 lower control limit, the positive detects are estimated and the non-detects are estimated.
- If the LCS recovery is less than 10 percent, the positive detects are estimated and the non-detects are rejected.

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	SMC	MS/MSD	LCS	Analytical	Field
Aqueous Matrix	Pesticides	✓J	✓	✓	✓	✓	✓J	✓	100%✓J	100%✓
	Maleic hydrazide	✓	✓	✓	✓	NA	✓	✓	100%✓	100%✓

NOTE: ✓ = The data are usable as reported based on the data quality review of this quality measurement.
✓J = The data are usable, however, some analyte concentrations should be considered estimates of the true concentrations.
NA = The quality measurement does not apply to this matrix or analytical methodology.

All maleic hydrazide and pesticides data are usable as reported based on the quality review for precision and accuracy provided in detail below. Minor sample biases are identified, and a detailed description of holding time issues (Section D.2) and accuracy issues (Section D.4) are provided below. The following sections provide a detailed discussion of each of the above quality measurements.

D.1.3 Field Sampling Program Quality Control

A field duplicate sample was collected and analyzed for the same parameters as the environmental samples to determine field sampling precision. An equipment rinsate blank was not required due to the use of dedicated pumping systems in each well.

D.1.4 Laboratory Analytical Quality Control Program

Aqueous samples collected from the monitoring wells were analyzed for Target Compound List pesticides by EPA SW-846 Method 8081A and maleic hydrazide by EPA Method 632 Modified. The quality control measures specified in the EPA SW-846 methodology (MS/MSD, SMC, LCS, and laboratory duplicates), 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 is discussed in the subsections below.

D.2 SAMPLE HOLDING TIMES

Holding times (defined as the time from sample collection to the time of sample preparation/ analysis) were compared against the maximum holding times identified in the quality control requirements of the referenced analytical methods. The holding times were met for maleic hydrazide and pesticides with the exception of the re-analysis of the pesticides for Sample MW-NASB-098 and the MS/MSD. The pesticide results for these three samples were extracted 2 days outside the holding time criteria (7 days to extract). The pesticide data for Sample MW-NASB-098 should be considered estimated.

D.3 PRECISION

D.3.1 Pesticide Compounds

All compounds were used to quantify the MS/MSD RPD. The control limits identified in the QAPP were the same as those reported by the laboratory. The MS/MSD was performed on Sample MW-NASB-098.

The MS/MSD RPDs for pesticide compounds were within the established control limits, and data are usable as reported based on the quality review of the analytical precision measurement review. The data user should note that the MS/MSD was extracted outside the holding time criteria (see Section D.2 for further discussion).

D.3.2 Maleic Hydrazide

The maleic hydrazide compound was used to quantify the MS/MSD RPD. The MS/MSD was performed on Sample MW-NASB-098.

The MS/MSD RPDs for the maleic hydrazide compound were within the established control limits, and data are usable as reported based on the quality review of the analytical precision measurement review.

D.4 ACCURACY

D.4.1 Pesticide Compounds

Two SMCs were used to measure the ability of the laboratory to extract the target compounds from the environmental samples. The control limits identified in the QAPP and reported by the laboratory were the same for the two SMCs. The monitoring well sample SMC recoveries were within the established control limits with the exception of decachlorobiphenyl (59 percent) in Sample MW-NASB-097 and decachlorobiphenyl (65 percent) in Sample MW-NASB-098. The sample results in Samples MW-NASB-097 and MW-NASB-098 are considered usable since the

other surrogate recovery was within the control criteria. The data user should note that the data for MW-NASB-098 were previously qualified due to the exceedance of the holding time criteria (see Section D.2 for further discussion).

All compounds were used to quantify the MS/MSD recoveries. The MS/MSD recovery limits stated in the QAPP were the same as those reported by the laboratory. MS/MSD recoveries were within the established control limits; data are usable as reported. The data user should note that the data for MW-NASB-098 were previously qualified due to the exceedance of the holding time criteria (see Section D.2 for further discussion).

All of the pesticide compounds were used to quantify the LCS recoveries against laboratory established control limits. The monitoring well aqueous LCS recoveries were within laboratory established control limits; data are usable as reported.

D.4.2 Maleic Hydrazide

Maleic hydrazide was used to quantify MS/MSD recoveries against laboratory established control limits. The MS/MSD recoveries were within the established accuracy control. The data are usable as reported based on the review of the MS/MSD recoveries.

Maleic hydrazide was used to quantify LCS recoveries against laboratory established control limits. The LCS recoveries were within laboratory established accuracy control limits. The data are usable as reported based on the review of LCS accuracy.

D.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 percent analytical completeness for field samples is 100 percent. The planned field samples and the corresponding quality control samples (duplicate) were collected, resulting in a percent field completeness of 100 percent.

D.6 FIELD QUALITY CONTROL BLANKS

D.6.1 Laboratory Method Blanks

Method blank results were reviewed and were void of contaminants of concern for standard pesticide list compounds (EPA Method 8081A) and maleic hydrazide.

D.6.2 Trip Blanks

Trip blanks are indicators for cross-contamination of volatile organic compounds during sample shipment. Samples were not designated for volatile organic compound analysis, therefore, no trip blanks were collected.

D.7 DUPLICATE FIELD SAMPLES

Field duplicate samples were used to evaluate the overall precision of both the field and laboratory. Typically, these results have more variability than laboratory precision measurements, with the extremes being noted in soil matrices. Based on EPA Region 1 criteria for evaluating field duplicates, the following guideline was used to review the field duplicate taken during the sampling event. The overall precision of organic compounds was evaluated by reviewing the RPD (non-detects were defined as one-half the reporting limit) and was considered acceptable when less than 30 percent.

The sample locations of the field duplicate samples were not identified to the laboratory. One duplicate sample was collected during monitoring well sampling. The field duplicate sample was collected from monitoring well MW-NASB-098. Precision requirements were met for pesticide analyses of the duplicate sample; the results are usable as reported.

D.8 METHOD DETECTION LIMITS FOR AQUEOUS SAMPLES

Appendix D.1 provides the method detection limit for aqueous samples. The method detection limit 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 and is determined from analysis of a sample for a given matrix.

Appendix D.1

Method Detection Limits for Sediment and Aqueous Samples

Target Analytes	EPA Method	Soil Accuracy %Recovery	Aqueous Accuracy %Recovery	Soil Precision RPD	Soil Precision RPD	Soil PQLs (ppb)	Water PQLs (ppb)	Soil MDLs (ppb)	Water MDLs (ppb)
alpha-BHC	8081A	40-140	40-140	≤50	≤50	5	0.1	0.65	0.021
gamma-BHC (Lindane)	8081A	40-140	40-140	≤50	≤50	5	0.1	1.5	0.024
beta-BHC	8081A	40-140	40-140	≤50	≤50	5	0.1	1.1	0.032
delta-BHC	8081A	40-140	40-140	≤50	≤50	5	0.1	1.3	0.015
Heptachlor	8081A	40-140	40-140	≤50	≤50	5	0.1	1	0.018
Aldrin	8081A	40-140	40-140	≤50	≤50	5	0.1	1.2	0.016
Heptachlor Epoxide	8081A	40-140	40-140	≤50	≤50	5	0.1	0.8	0.026
gamma- chlordane	8081A	40-140	40-140	≤50	≤50	5	0.1	0.8	0.018
alpha - chlordane	8081A	40-140	40-140	≤50	≤50	5	0.1	0.9	0.018
4,4'-DDE	8081A	40-140	40-140	≤50	≤50	5	0.1	1.2	0.026
Endosulfan I	8081A	40-140	40-140	≤50	≤50	5	0.1	0.95	0.029
Dieldrin	8081A	40-140	40-140	≤50	≤50	5	0.1	0.8	0.021
Endrin	8081A	40-140	40-140	≤50	≤50	5	0.1	0.8	0.035
4,4'-DDD	8081A	40-140	40-140	≤50	≤50	5	0.1	0.8	0.027
Endosulfan II	8081A	40-140	40-140	≤50	≤50	5	0.1	0.6	0.026
4,4'-DDT	8081A	40-140	40-140	≤50	≤50	5	0.2	1	0.067
Endrin Aldehyde	8081A	40-140	40-140	≤50	≤50	5	0.1	1.2	0.034
Methoxychlor	8081A	40-140	40-140	≤50	≤50	5	0.2	1.5	0.05
Endosulfan Sulfate	8081A	40-140	40-140	≤50	≤50	5	0.1	1.3	0.03
Endrin Ketone	8081A	40-140	40-140	≤50	≤50	5	0.1	1.2	0.022
Decachlorobiphenyl	8081A	40-140	40-140	-	-	-	-		
Tetrachloro-m-xylene	8081A	40-140	40-140	-	-	-	-		

ESS Laboratory

Pesticide Method Detection Limit Study

GC6 Front Column

Analyst: VSC
Matrix: Soil
Prep Analyst: NR
Units ug/L

Analytical Method: 8081A
Date Analyzed: 5/22/02
Extraction Method: 3510C
Date Extracted: 5/16/02

Compound Name	Spike Added	PT05160 2B8BS1	PT05160 2B8BS3	PT05160 2B8BS4	PT05160 2B8BS5	PT05160 2B8BS6	PT05160 2B8BS7	PT05160 2B8BS8	Ave	SD	MDL	MDL *3	MRL*	MRL ug/L
alpha-BHC	10	8.92	8.204	7.951	7.999	8.593	8.939	8.514	8.43	0.41	1.28	3.8	10	0.1
gamma-BHC (Lindane)	10	10.038	9.148	8.438	8.491	9.169	9.54	9.115	9.14	0.56	1.76	5.3	10	0.1
beta-BHC	10	10.7123	9.895	9.46	9.472	9.773	10.322	10.199	9.94	0.46	1.45	4.4	10	0.1
delta-BHC	10	8.612	7.756	7.636	7.488	7.826	8.298	7.781	7.94	0.40	1.25	3.7	10	0.1
Heptachlor	10	10.573	9.826	9.115	9.28	9.913	10.346	9.958	9.84	0.52	1.65	4.9	10	0.1
Aldrin	10	8.099	7.54	7.523	7.428	7.673	8.415	7.659	7.78	0.36	1.13	3.4	10	0.1
Heptachlor Epoxide	10	9.317	8.578	8.123	7.96	8.587	9.121	8.539	8.61	0.49	1.53	4.6	10	0.1
gamma-Chlordane	10	9.108	8.369	8.05	7.762	8.312	8.921	8.145	8.42	0.48	1.50	4.5	10	0.1
alpha-Chlordane	10	9.244	8.547	8.217	8.2	8.538	9.276	8.254	8.67	0.47	1.46	4.4	10	0.1
Endosulfan I	10	7.898	7.259	7.332	7.113	7.297	8.051	7.325	7.49	0.36	1.12	3.4	10	0.1
4,4′-DDE	10	9.182	8.396	8.294	8.096	8.529	9.276	8.465	8.63	0.45	1.41	4.2	10	0.1
Dieldrin	10	9.128	8.35	8.03	7.743	8.328	8.948	8.2	8.42	0.49	1.54	4.6	10	0.1
Endrin	10	9.646	8.842	8.61	8.163	9	9.456	9.035	8.95	0.50	1.57	4.7	10	0.1
4,4′-DDD	10	10.655	9.887	9.719	9.096	9.752	10.421	9.875	9.92	0.51	1.59	4.8	10	0.1
Endosulfan I	10	10.329	9.438	9.239	8.689	9.391	9.799	9.018	9.48	0.53	1.67	5.0	10	0.1
4,4′-DDT	10	12.395	11.781	11.513	11.338	11.706	12.263	12.352	11.83	0.43	1.34	4.0	10	0.1
Endrin Aldehyde	10	10.429	10.134	9.397	8.816	9.398	10.075	8.046	9.71	0.84	2.62	7.9	10	0.1
Methoxychlor	10	10.224	9.989	9.837	10.252	10.096	11.135	10.867	10.26	0.48	1.50	4.5	10	0.1
Endosulfan Sulfate	10	10.845	10.034	9.836	9.252	9.848	10.483	9.938	10.05	0.51	1.60	4.8	10	0.1
Endrin Ketone	10	12.452	11.627	11.323	10.744	11.154	11.926	11.37	11.54	0.55	1.74	5.2	10	0.1

*MRL on column

LIST DEFINITIONS REPORT (prntlist)

Aug 06, 2003 01:47 pm

ListQoin	Listtype	Process	Matclass	Pkey	Cflag	Expired	Chain
LJ7660	SW8260-S	REPORT	AQ	EAENGMABNASOQ2	Y		REPORT

Parameter	Replid	Parmtype	M	Units	MDL	MDL Units	RDL	RDL Units
Chloromethane		REG	N	ug/L	.28	ug/L	2	ug/L
Vinyl Chloride		REG	N	ug/L	.1	ug/L	2	ug/L
Bromomethane		REG	N	ug/L	.93	ug/L	2	ug/L
Chloroethane		REG	N	ug/L	.27	ug/L	2	ug/L
1,1-Dichloroethene		REG	N	ug/L	.28	ug/L	1	ug/L
Carbon Disulfide		REG	N	ug/L	.17	ug/L	1	ug/L
Methylene Chloride		REG	N	ug/L	.33	ug/L	2	ug/L
Acetone		REG	N	ug/L	2.77	ug/L	5	ug/L
1,1-Dichloroethane		REG	N	ug/L	.11	ug/L	1	ug/L
1,2-Dichloroethylene (Total)		REG	N	ug/L	1.15	ug/L	2	ug/L
Chloroform		REG	N	ug/L	.18	ug/L	1	ug/L
Carbon Tetrachloride		REG	N	ug/L	.3	ug/L	1	ug/L
1,1,1-Trichloroethane		REG	N	ug/L	.68	ug/L	1	ug/L
2-Butanone		REG	N	ug/L	1.87	ug/L	5	ug/L
Benzene		REG	N	ug/L	.13	ug/L	1	ug/L
1,2-Dichloroethane		REG	N	ug/L	.29	ug/L	1	ug/L
Trichloroethene		REG	N	ug/L	.6	ug/L	1	ug/L
1,2-Dichloropropane		REG	N	ug/L	.21	ug/L	1	ug/L
Bromodichloromethane		REG	N	ug/L	.25	ug/L	1	ug/L
cis-1,3-Dichloropropene		REG	N	ug/L	.45	ug/L	1	ug/L
Toluene		REG	N	ug/L	.18	ug/L	1	ug/L
4-Methyl-2-Pentanone		REG	N	ug/L	1.78	ug/L	5	ug/L
Tetrachloroethene		REG	N	ug/L	.36	ug/L	1	ug/L
trans-1,3-Dichloropropene		REG	N	ug/L	.42	ug/L	1	ug/L
1,1,2-Trichloroethane		REG	N	ug/L	.31	ug/L	1	ug/L
Dibromochloromethane		REG	N	ug/L	.26	ug/L	1	ug/L
2-Hexanone		REG	N	ug/L	1.55	ug/L	5	ug/L
Chlorobenzene		REG	N	ug/L	.22	ug/L	1	ug/L
Ethylbenzene		REG	N	ug/L	.11	ug/L	1	ug/L
Xylenes (Total)		REG	N	ug/L	.34	ug/L	3	ug/L
Styrene		REG	N	ug/L	.28	ug/L	1	ug/L
Bromoform		REG	N	ug/L	.45	ug/L	1	ug/L
1,1,2,2-Tetrachloroethane		REG	N	ug/L	.41	ug/L	1	ug/L
1,3-Dichlorobenzene		REG	N	ug/L	.22	ug/L	1	ug/L
1,4-Dichlorobenzene		REG	N	ug/L	.17	ug/L	1	ug/L
1,2-Dichlorobenzene		REG	N	ug/L	.25	ug/L	1	ug/L
trans-1,2-Dichloroethene		REG	N	ug/L	.69	ug/L	1	ug/L
cis-1,2-Dichloroethene		REG	N	ug/L	.46	ug/L	1	ug/L
m+p-Xylenes		REG	N	ug/L	.18	ug/L	2	ug/L
o-Xylene		REG	N	ug/L	.16	ug/L	1	ug/L
P-Bromofluorobenzene		SURR	N	%		%		%
Toluene-d8		SURR	N	%		%		%
1,2-Dichloroethane-d4		SURR	N	%		%		%
Dibromofluoromethane		SURR	N	%		%		%

Matn	Sl prod	Pointer	Stored Parameter	Chain	Description	LinkID
AQ	SW8260-S	REPORT		REPORT	SW8260 SPECIAL LIST	LL2669

LIST DEFINITIONS REPORT (prntlist)

Aug 06, 2003 01:47 pm

ListJoin	Listtype	Process	Marclass	Pkey	CFlag	Expired	Chain

Parameter	Replid	Parmtype	M	Units	MDL	MDL Units	RDL	RDL Units
DJ9055	SW8260-S	REPORT	SL		EAENGMABNAS001	Y		REPORT
Chloromethane		REG	N	ug/Kg	2.8	ug/Kg	10	ug/Kg
Vinyl Chloride		REG	N	ug/Kg	1.34	ug/Kg	10	ug/Kg
Bromomethane		REG	N	ug/Kg	2.33	ug/Kg	10	ug/Kg
Chloroethane		REG	N	ug/Kg	2.56	ug/Kg	10	ug/Kg
1,1-Dichloroethene		REG	N	ug/Kg	1.6	ug/Kg	5	ug/Kg
Carbon Disulfide		REG	N	ug/Kg	1.49	ug/Kg	5	ug/Kg
Methylene Chloride		REG	N	ug/Kg	4.04	ug/Kg	5	ug/Kg
Acetone		REG	N	ug/Kg	9.08	ug/Kg	25	ug/Kg
trans-1,2-Dichloroethene		REG	N	ug/Kg	1.49	ug/Kg	5	ug/Kg
1,1-Dichloroethane		REG	N	ug/Kg	1.29	ug/Kg	5	ug/Kg
cis-1,2-Dichloroethene		REG	N	ug/Kg	1.58	ug/Kg	5	ug/Kg
1,2-Dichloroethylene (Total)		REG	N	ug/Kg	3.07	ug/Kg	10	ug/Kg
Chloroform		REG	N	ug/Kg	1.02	ug/Kg	5	ug/Kg
Carbon Tetrachloride		REG	N	ug/Kg	1.58	ug/Kg	5	ug/Kg
1,1,1-Trichloroethane		REG	N	ug/Kg	1.47	ug/Kg	5	ug/Kg
2-Butanone		REG	N	ug/Kg	7.46	ug/Kg	25	ug/Kg
Benzene		REG	N	ug/Kg	1.19	ug/Kg	5	ug/Kg
1,2-Dichloroethane		REG	N	ug/Kg	1.23	ug/Kg	5	ug/Kg
Trichloroethene		REG	N	ug/Kg	2.14	ug/Kg	5	ug/Kg
1,2-Dichloropropane		REG	N	ug/Kg	2.03	ug/Kg	5	ug/Kg
Bromodichloromethane		REG	N	ug/Kg	1	ug/Kg	5	ug/Kg
cis-1,3-Dichloropropene		REG	N	ug/Kg	2.27	ug/Kg	5	ug/Kg
Toluene		REG	N	ug/Kg	2.48	ug/Kg	5	ug/Kg
4-Methyl-2-Pentanone		REG	N	ug/Kg	12.21	ug/Kg	25	ug/Kg
Tetrachloroethene		REG	N	ug/Kg	1.5	ug/Kg	5	ug/Kg
trans-1,3-Dichloropropene		REG	N	ug/Kg	1.91	ug/Kg	5	ug/Kg
1,1,2-Trichloroethane		REG	N	ug/Kg	1.33	ug/Kg	5	ug/Kg
Dibromochloromethane		REG	N	ug/Kg	1.52	ug/Kg	5	ug/Kg
2-Hexanone		REG	N	ug/Kg	8.49	ug/Kg	25	ug/Kg
Chlorobenzene		REG	N	ug/Kg	1.09	ug/Kg	5	ug/Kg
Ethylbenzene		REG	N	ug/Kg	1.24	ug/Kg	5	ug/Kg
Xylenes (Total)		REG	N	ug/Kg	3	ug/Kg	15	ug/Kg
m+p-Xylenes		REG	N	ug/Kg	2.08	ug/Kg	10	ug/Kg
o-Xylene		REG	N	ug/Kg	.92	ug/Kg	5	ug/Kg
Styrene		REG	N	ug/Kg	1.02	ug/Kg	5	ug/Kg
Bromoform		REG	N	ug/Kg	1.24	ug/Kg	5	ug/Kg
1,1,2,2-Tetrachloroethane		REG	N	ug/Kg	2.44	ug/Kg	5	ug/Kg
1,3-Dichlorobenzene		REG	N	ug/Kg	1.39	ug/Kg	5	ug/Kg
1,4-Dichlorobenzene		REG	N	ug/Kg	1.53	ug/Kg	5	ug/Kg
1,2-Dichlorobenzene		REG	N	ug/Kg	.91	ug/Kg	5	ug/Kg
p-Bromofluorobenzene		SURR	N	%		%		%
Toluene-D8		SURR	N	%		%		%
1,2-Dichloroethane-D4		SURR	N	%		%		%
Dibromofluoromethane		SURR	N	%		%		%

Matn	Sl prod	Pointer	Stored Parameter	Chain	Description	LinkID
SL	SW8260-S	REPORT		REPORT	SW8260 MASTER LIST	LL2670

LIST DEFINITIONS REPORT (prntlist)

Aug 06, 2003 01:48 pm

ListJoin	Listtype	Process	Matclass	Pkey	Crlag	Expired	Chain

Parameter	Replid	Parmtype	M	Units	MDL	MDL Units	RDL	RDL Units
LAJ7618	SW8081	REPORT		AQ	STD	Y		
alpha-BHC		REG	N	ug/L	.025	ug/L	.05	ug/L
Gamma BHC		REG	N	ug/L	.022	ug/L	.05	ug/L
Heptachlor		REG	N	ug/L	.024	ug/L	.05	ug/L
Aldrin		REG	N	ug/L	.022	ug/L	.05	ug/L
beta-BHC		REG	N	ug/L	.042	ug/L	.05	ug/L
delta-BHC		REG	N	ug/L	.029	ug/L	.05	ug/L
Heptachlor Epoxide		REG	N	ug/L	.023	ug/L	.05	ug/L
Endosulfan I		REG	N	ug/L	.018	ug/L	.05	ug/L
Gamma-Chlordane		REG	N	ug/L	.019	ug/L	.05	ug/L
Alpha-Chlordane		REG	N	ug/L	.019	ug/L	.05	ug/L
4,4'-DDE		REG	N	ug/L	.028	ug/L	.1	ug/L
Dieldrin		REG	N	ug/L	.017	ug/L	.1	ug/L
Endrin		REG	N	ug/L	.018	ug/L	.1	ug/L
4,4'-DDD		REG	N	ug/L	.028	ug/L	.1	ug/L
Endosulfan II		REG	N	ug/L	.016	ug/L	.1	ug/L
4,4'-DDT		REG	N	ug/L	.03	ug/L	.1	ug/L
Endrin Aldehyde		REG	N	ug/L	.021	ug/L	.1	ug/L
Endosulfan Sulfate		REG	N	ug/L	.023	ug/L	.1	ug/L
Methoxychlor		REG	N	ug/L	.045	ug/L	.5	ug/L
Endrin Ketone		REG	N	ug/L	.02	ug/L	.1	ug/L
Toxaphene		REG	N	ug/L	.92	ug/L	1	ug/L
Tetrachloro-M-Xylene		SURR	N	%				%
Decachlorobiphenyl		SURR	N	%				%

Matn	Sl prod	Pointer	Stored Parameter	Chain	Description	LinkID
AQ	SW8081	REPORT		REPORT	REPORT	LL1044

LIST DEFINITIONS REPORT (prntlist)

Aug 06, 2003 01:48 pm

ListJoin	Listtype	Process	Matclass	PKey	CRlag	Expired	Chain
Parameter	Replid	Parmtype	M	Units	MDL	MDL Units	RDL	RDL Units
LJ7619	SW8081	REPORT	SL	STD				
alpha-BHC		REG	N	ug/Kg	.68	ug/Kg	1.7	ug/Kg
gamma BHC		REG	N	ug/Kg	.59	ug/kg	1.7	ug/Kg
Heptachlor		REG	N	ug/Kg	.55	ug/Kg	1.7	ug/Kg
Aldrin		REG	N	ug/Kg	.56	ug/Kg	1.7	ug/Kg
beta-BHC		REG	N	ug/Kg	1.02	ug/Kg	1.7	ug/Kg
delta-BHC		REG	N	ug/Kg	.58	ug/Kg	1.7	ug/Kg
Heptachlor Epoxide		REG	N	ug/Kg	.65	ug/Kg	1.7	ug/Kg
Endosulfan I		REG	N	ug/Kg	.61	ug/Kg	1.7	ug/Kg
Gamma-Chlordane		REG	N	ug/Kg	.63	ug/Kg	1.7	ug/Kg
Alpha-Chlordane		REG	N	ug/Kg	.69	ug/Kg	1.7	ug/Kg
4,4'-DDE		REG	N	ug/Kg	.62	ug/Kg	3.3	ug/Kg
Dieldrin		REG	N	ug/Kg	.6	ug/Kg	3.3	ug/Kg
Endrin		REG	N	ug/Kg	.57	ug/Kg	3.3	ug/Kg
4,4'-DDD		REG	N	ug/Kg	.62	ug/Kg	3.3	ug/Kg
Endosulfan II		REG	N	ug/Kg	.57	ug/Kg	3.3	ug/Kg
4,4'-DDT		REG	N	ug/Kg	.55	ug/Kg	3.3	ug/Kg
Endrin Aldehyde		REG	N	ug/Kg	.67	ug/Kg	3.3	ug/Kg
Endosulfan Sulfate		REG	N	ug/Kg	.69	ug/Kg	3.3	ug/Kg
Methoxychlor		REG	N	ug/Kg	1.02	ug/Kg	17	ug/Kg
Endrin Ketone		REG	N	ug/Kg	.73	ug/Kg	3.3	ug/Kg
Toxaphene		REG	N	ug/Kg	11.62	ug/Kg	33	ug/Kg
Tetrachloro-M-Xylene		SURR	N	%				%
Decachlorobiphenyl		SURR	N	%				%

Matn	S1 prod	Pointer	Stored Parameter	Chain	Description	LinkID
SL	SW8081	REPORT		REPORT	REPORT	LL1045

Appendix E

Field Monitoring and Sampling Forms

E.1 Field Record of Well Gauging Form
E.2 Field Record of Well Gauging, Purging, and Sampling Forms

Appendix E.1

Field Record of Well Gauging Form

FIELD RECORD OF WELL GAUGING

Project Name:	NASB, ME LTM Bld 95	Weather:	Gauge Date: Sept 9 2002
Project Number:	2960047	Sounding Method:	Gauge Time:
EA Personnel:		Equipment:	

Well Identification Number	Well Lock Status	Stick Up or F.M.	Well Physical Condition	VOC Concentrations		Protective Casing Elevation (ft)	PVC Casing Elevation (ft)	Well Diameter (inches)	Total Depth of Well (ft)	Depth to Water (ft)	Depth to to Liquid (ft)	Water Table Elevation (ft)	Dedicated Pump
				Ambient Air (ppm)	Well Mouth (ppm)								
Bld 95													
MW-NASB-065	Good	Stick Up	Good	ND	ND		74.29	2	15.50	6.11	ND	68.18	Pump
MW-NASB-066	Good	Stick Up	Good	ND	ND		78.79	2	19.79	10.04	ND	68.75	Pump
MW-NASB-067	Good	Stick Up	Good	ND	ND		74.30	2	15.00	6.05	ND	68.25	Pump
MW-NASB-068	Good	Stick Up	Good	ND	ND		74.86	2	15.05	6.86	ND	68.00	Pump
MW-NASB-097	None	F.M.	Good	ND	ND		73.41	2	11.05	5.49	ND	67.92	No
MW-NASB-098	Good	Stick Up	Good	ND	ND		76.53	2	16.00	8.93	ND	67.60	No
ONFF													
MW-NASB-046	Good	Stick Up	Good	ND	ND		71.30	2	15.39	6.73	ND	64.57	No
MW-NASB-049	Good	Stick Up	Good	ND	ND		68.29	2	12.46	8.58	ND	59.71	No
MW-NASB-051	Good	Stick Up	Good	ND	ND		73.41	2	15.85	11.50	ND	61.91	No
MW-NASB-058	Good	Stick Up	Good	ND	ND		69.80	2	16.13	7.00	ND	62.80	No
MW-NASB-062	Good	Stick Up	Good	ND	ND		80.73	2	16.45	11.25	ND	69.48	No
MW-NASB-206	Good	Stick Up	Good	ND	ND		59.01	2	11.45	7.33	ND	51.68	No
MW-NASB-207	Good	Stick Up	Good	ND	ND		66.22	2	17.80	7.85	ND	58.37	No
MW-NASB-208	None	F.M.	Good/Tar	ND	ND		74.55	2	8.57	6.37	ND	68.18	No
MW-NASB-209R	None	F.M.	Good	ND	ND		72.94	2	10.00	6.37	ND	66.57	No
MW-NASB-210	Good	Stick Up	Good	ND	ND		77.55	2	16.69	9.08	ND	68.47	No
MW-NASB-244	None	F.M.	Good	ND	ND		70.73	2	9.72	5.76	ND	64.97	No
MW-NASB-245	None	F.M.	Good	ND	ND		67.51	2	9.71	6.15	ND	61.36	No

Comments:

FIELD RECORD OF WELL GAUGING

Project Name:	NASB, ME LTM Bld 95	Weather:	Overcast 45 C Wind	Gauge Date:	11/11/2002
Project Number:	2960047	Sounding Method:	Slope Indicator	Gauge Time:	1300
EA Personnel:	CDS MAC	Equipment:	Slope Indicator		

Well Identification Number	Well Lock Status	Stick Up or F.M.	Well Physical Condition	VOC Concentrations		Protective Casing Elevation (ft)	PVC Casing Elevation (ft)	Well Diameter (inches)	Total Depth of Well (ft)	Depth to Water (ft)	Depth to to Liquid (ft)	Water Table Elevation (ft)	Dedicated Pump
				Ambient Air (ppm)	Well Mouth (ppm)								
Bld 95													
MW-NASB-065	Good	Stick Up	Good	ND	ND		74.29	2	15.50	4.68	ND	69.61	Pump
MW-NASB-066	Good	Stick Up	Good	ND	ND		78.79	2	19.79	5.67	ND	73.12	Pump
MW-NASB-067	Good	Stick Up	Good	ND	ND		74.30	2	15.00	4.72	ND	69.58	Pump
MW-NASB-068	Good	Stick Up	Good	ND	ND		74.86	2	15.05	5.48	ND	69.38	Pump
MW-NASB-097	None	F.M.	Good	ND	ND		73.41	2	11.05	4.07	ND	69.34	No
MW-NASB-098	Good	Stick Up	Good	ND	ND		76.53	2	16.00	7.48	ND	69.05	No

Comm nts:

Appendix E.2

Field Record of Well Gauging, Purging, and Sampling Forms

Page____ of ____

FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

Project Name:	NASB, ME LTM	Project Number:	2960047
Well ID:	NASB 67 95-16	Well Lock Status:	
Well Condition:	Good	Weather:	Sunny Hot, Humid, Buggie
Gauge Date:		Gauge Time:	
Sounding Method:		Measurement Ref:	
Stick Up / Down:		Well Diameter:	
Purge Date:	9/10	Purge Time:	
Purge Method:		Field Personnel:	
Ambient Air VOC's (ppm)		Well Mouth VOC's (ppm)	
Well Depth (ft):		Well Volume/ft (L):	
Depth to Water (ft):	6.07	Well Volume (L):	
Liquid Depth (ft):	/	Three Well Volumes (L):	

Interval	Time (min)	Depth to Water (ft)	Purge Rate (Lpm)	Volume Purged (L)	pH	Temperature (C)	Conductivity (umhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	eH (mV)
Start	0830	6.07	≈200 L/m		5.84	14.42	217.00	.35	~~0~~ 61	~~2030~~ 59
1	0835	6.02	"		5.82	15.03	215.00	3.2	~~0~~ 61	~~60~~
2	0840	6.03	"		5.78	16.32	209	.52	1	64
3	0845	6.02	150 L/m		5.78	18.52	220	.33	1	59
4	0850	6.04	"		5.77	19.70	226	.31	1	51
5	0855	6.07	"		5.76	21.06	229	.33	2	44
6	0900	6.07	200 L/m		5.74	21.90	230	.28	2	44
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										

Sampling Date:	9-10-02
Sampling Time (Start / End)	0830 - 0900
Sample Type:	GRAB
Total Amount of Water Removed:	
Sample Parameters:	PEST
Sample Preservation:	NONE
Decon Fluids Used:	
Sample Bottle ID's:	
Sample Personnel:	

Comments:
9-18 Purge for Mike Hydrazido
START 1320 END 1355
2.5 GAL Removed

BN-95-16-MW-67

FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

Project Name:	NASB, ME LTM	Project Number:	2960047
Well ID:	MW-NASB097	Well Lock Status:	NOT LOCKED
Well Condition:	Good	Weather:	Clear / Hot / Humid
Gauge Date:	9/10	Gauge Time:	0823
Sounding Method:	Slope Indicator	Measurement Ref:	TOC
Stick Up / Down:	FM.	Well Diameter:	2"
Purge Date:	9/10/02	Purge Time:	
Purge Method:	Low flow	Field Personnel:	MAC / CS / BA
Ambient Air VOC's (ppm)		Well Mouth VOC's (ppm)	
Well Depth (ft):		Well Volume/ft (L):	
Depth to Water (ft):	MAC 5.46'	Well Volume (L):	
Liquid Depth (ft):		Three Well Volumes (L):	

Interval	Time (min)	Depth to Water MAC (ft)	Purge Rate (Lpm)	Volume Purged (L)	pH	Temperature (C)	Conductivity (umhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	eH (mV)
Start	0825	5.46'	0.2	—	5.97	17.14	124	3.32	557	25
1	0830	5.50	0.2	1.0	6.03	17.30	120	3.20	515	30
2	0835	5.49	0.1	1.5	6.07	18.10	118	3.25	343	34
3	0840	5.52	0.1	2.0	6.13	20.82	110	6.07	75	75
4	0845	5.50	0.1	2.5	5.98	22.87	113	4.58	69	83
5	0850	5.45	0.1	3.0	5.93	23.92	116	4.45	108	96
6	0855	5.48	0.1	3.5	5.89	25.64	117	5.72	102	112
7	0900	5.49	0.1	4.0	5.82	25.90	111	5.29	60	127
8	0905	5.48	0.1	4.5	5.82	25.74	110	5.54	50	142
9	0910	5.46	0.1	5.0	5.80	25.61	108	5.69	48	148
10	0915	5.48	0.1	5.5	5.81	25.42	107	4.02	30	152
11	0920	5.48	0.2	6.5	5.79	25.44	106	3.70	18	155
12	0925	5.51	0.2	7.5	5.79	26.04	107	3.57	20	157
13	0930	5.49	0.2	8.5	5.79	25.51	106	3.53	14	161
14	0935	5.48	0.2	9.5	5.79	25.20	104	3.49	12	163
15	0940	5.49	0.2	10.5	5.77	25.45	104	3.44	29	166
16	0943	5.52	0.2	11.1	5.78	25.84	106	3.37	15	166
17	0946	5.52	0.2	11.7	5.78	25.69	106	3.39	11	167
18	0949	5.52	0.2	12.3	5.78	24.21	101	3.45	6	168
19	0952	5.50	0.2	12.9	5.79	22.50	99	3.47	13	171
20	0955	5.50	0.2	13.5	5.79	21.02	94	3.48	9	173
21	0958	5.50	0.2	14.1	5.80	20.54	93	3.47	6	173
22	1001	5.53	0.2	14.7	5.79	20.17	94	3.40	5	173
23										
24										
25										

Sampling Date:	9/10/02
Sampling Time (Start / End)	0825 1004
Sample Type:	Grab
Total Amount of Water Removed:	14.7 L
Sample Parameters:	Pesticides
Sample Preservation:	None
Decon Fluids Used:	DI / Alconox / Isopropyl
Sample Bottle ID's:	EN-95.16-MW097
Sample Personnel:	MAC / BA / CS

Comments:
0836 - Dumped cell
0848 - Cleaned T/T probe
0852 - Cleaned cell, cycled pump
0911 - Dumped cell, cycled pump
0940 - cycled pump
9/11/02 - Begin purge @ 1320

Page ____ of ____

FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

Project Name:	NASB, ME LTM	Project Number:	2960047
Well ID:	NASB MW	Well Lock Status:	
Well Condition:	Good Loose CASING	Weather:	
Gauge Date:		Gauge Time:	
Sounding Method:		Measurement Ref:	
Stick Up / Down:		Well Diameter:	
Purge Date:	9-10-02	Purge Time:	
Purge Method:	Low Flow	Field Personnel:	
Ambient Air VOC's (ppm)		Well Mouth VOC's (ppm)	
Well Depth (ft):	16.00	Well Volume/ft (L):	
Depth to Water (ft):	8.92	Well Volume (L):	
Liquid Depth (ft):		Three Well Volumes (L):	

Interval	Time (min)	Depth to Water (ft)	Purge Rate (Lpm)	Volume Purged (L)	pH	Temperature (C)	Conductivity (umhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	eH (mV)
Start	0925	8.92	200 ml/min		5.32	18.00	215	2.05	534	37
1	0930	9.01	200		5.83	16.87	203	.26	380	~~365~~ 366
2	0935	9.01	200		6.04	19.51	190	.24	137	52
3	0940	9.01	150		5.97	19.94	178	.25	94	59
4	0945	9.01	150		5.91	20.07	165	.80	80	75
5	0950	8.95	100		5.97	20.20	170	.61	74.8	66
6	0955	9.00	100		5.93	21.04	163	.47	51	66
7	1000	8.96	100		5.89	21.70	158	.24	48	68
8	1005	8.97	100		5.89	22.02	158	.42	40	69
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										

Sampling Date:	9-10-01
Sampling Time (Start / End)	0925 – 1005
Sample Type:	Post WaTer
Total Amount of Water Removed:	
Sample Parameters:	
Sample Preservation:	None
Decon Fluids Used:	
Sample Bottle ID's:	BN-95-16 MW-98
Sample Personnel:	COS / BDA

Comments:

9-18 Purge For MW0CH2M65.20
START 1420 END 1510
9.5gal GAL. Purged

Pump # 9510R.0121

BN-95-16-MW-98

Page 1 of 1

FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

Project Name: Long Term Monitoring Plan-NASB, ME
Project Number: 2960047
Well ID: MW067 Bldg 95
Well Lock Status: good
Well Condition: Good
Weather: Cloudy, windy, warm, humid

Gauge Date: 11/11/02
Gauge Time: 1515
Sounding Method: Slope Indicator
Measurement Ref: TOC
Stick Up / Down: Up
Well Diameter: 2"

Purge Date: 11/11/02
Purge Time: 1530
Purge Method: Low - Flow Purge
Field Personnel: MAC
Ambient Air VOC's (ppm)
Well Mouth VOC's (ppm)

Well Depth (ft):
Well Volume/ft (L):
Depth to Water (ft): 4.72
Well Volume (L):
Liquid Depth (ft):
Three Well Volumes (L):

Interval	Time (min)	Depth to Water (ft)	Purge Rate (ml/min)	Temper-ature (C)	Conduc-tivity (umhos/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	pH	Turbidity (NTU)
Start	1530	4.72	100	13.25	175	0.69	52	6.03	7
1	1535	4.73	100	14.47	182	0.18	-9	5.98	6
2	1540	4.73	100	15.62	188	0.18	-27	6.00	4
3	1545	4.73	100	16.22	185	0.12	-32	5.99	3
4	1548	4.73	100	16.53	185	0.11	-32	6.01	3
5	1551	4.73	100	16.69	186	0.14	-31	6.01	2
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Sampling Date: 11/11/02
Sampling Time (Start / End) 1553
Sample Type: Grab
Total Amount of Water Removed:
Sample Parameters: Maleic Hydrazide
Sample Preservation: None
Decon Fluids Used: NONE - DED PUMP
Sample Bottle ID's: BN-6-95-MW067

Comments:
Strong chemical odor in purge water

FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

Project Name: Long Term Monitoring Plan-NASB, ME	Project Number: 2960047
Well ID: MW 097	Well Lock Status: None / F.M.
Well Condition: OK	Weather: Cloudy, breezy, warm
Gauge Date: 11/11/02	Gauge Time: 1555
Sounding Method: Slope Indicator	Measurement Ref: TOC
Stick Up / Down: FM	Well Diameter: 2"
Purge Date: 11/11/02	Purge Time: 1416
Purge Method: Low - Flow Purge	Field Personnel: MAC
Ambient Air VOC's (ppm)	Well Mouth VOC's (ppm)
Well Depth (ft):	Well Volume/ft (L):
Depth to Water (ft): 4.07'	Well Volume (L):
Depth to Depth (ft):	Three Well Volumes (L):

Interval	Time (min)	Depth to Water (ft)	Purge Rate (ml/min)	Temperature (C)	Conductivity (umhos/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	pH	Turbidity (NTU)
Start	1416	4.07	200	14.04	116	1.02	11	6.18	7400
1	1420	4.12	100	14.00	112	1.24	-13	6.25	7400
2	1425	4.12	100	16.70	113	2.23	22	6.09	118
3	1430	4.12	100	16.60	79	1.94	42	6.09	71
4	1435	4.12	100	17.02	86	1.90	53	6.09	63
5	1440	4.12	100	16.99	80	2.00	62	6.08	45
6	1445	4.12	100	17.08	93	1.97	73	6.07	40
7	1450	4.12	100	19.22	84	1.70	78	6.07	28
8	1455	4.12	100	20.51	78	1.56	161	5.99	24
9	1500	4.12	100	19.93	76	1.52	155	5.98	15
10	1505	4.12	100	19.66	78	1.66	143	5.96	11
11	1510	4.12	100	19.65	82	1.57	139	5.95	10
12	1513	4.12	100	19.67	83	1.59	137	5.95	9
13	1516	4.12	100	19.65	82	1.53	136	5.94	10
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Sampling Date: 11/11/02	Comments: TU by handheld
Sampling Time (Start / End) 1520	
Sample Type: Grab	Dumped flow cell 2x
Total Amount of Water Removed:	
Sample Parameters: Maleic Hydrazide	
Sample Preservation: NONE	
Decon Fluids Used: ISOPROPYL, ALCONOX, DI	
Sample Bottle ID's: BN-6-95-MW 097	

Page ___ of ___

FIELD RECORD OF WELL GAUGING, PURGING, AND SAMPLING

Project Name: Long Term Monitoring Plan-NASB, ME	Project Number: 2960047
Well ID: 098	Well Lock Status: Good
Well Condition: Good	Weather: Overcast windy 65°
Gauge Date:	Gauge Time:
Sounding Method:	Measurement Ref:
Stick Up / Down:	Well Diameter:
Purge Date: 11-11-02	Purge Time:
Purge Method: Low - Flow Purge	Field Personnel: CDS
Ambient Air VOC's (ppm) ND	Well Mouth VOC's (ppm) ND
Well Depth (ft):	Well Volume/ft (L): —
Depth to Water (ft): 7.48	Well Volume (L): —
Liquid Depth (ft): ND	Three Well Volumes (L): —

Interval	Time (min)	Depth to Water (ft)	Purge Rate (ml/min)	Temperature (C)	Conductivity (umhos/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	pH	Turbidity (NTU)
Start	1440	7.52	150	13.51	94	0.30	58.3	5.29	—
1	1445	7.66	150	13.99	91	0.24	60.5	5.61	—
2	1450	7.67	150	14.62	79	0.40	58.9	5.76	—
3	1455	7.67	150	17.20	85	0.78	52.6	5.82	—
4	1500	7.67	150	17.17	86	0.58	49.3	5.87	—
5	1505	7.67	150	17.62	95	0.41	41.9	5.94	—
6	1510	7.67	150	18.00	100	0.50	38.8	5.95	—
7	1515	7.67	150	18.23	102	0.46	36.3	5.96	—
8	1520	7.65	150	18.53	103	0.41	35.0	5.96	—
9	1525	7.65	150	18.55	104	0.39	34.4	5.97	—
10	1530	7.61	150	18.47	105	0.35	33.9	5.95	—
11	1535	7.62	150	18.62	106	0.23	30.5	5.96	—
12	1540	7.62	150	18.73	106	0.23	29.2	5.97	—
13	1545	7.62	150	18.84	107	0.25	29.8	5.97	—
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Sampling Date:	Comments:
Sampling Time (Start / End) 1550	
Sample Type:	
Total Amount of Water Removed:	
Sample Parameters:	
Sample Preservation:	
Decon Fluids Used:	
Sample Bottle ID's: BN-6-95-MW98	

Appendix F

Engineering Inspection Report

Engineering Inspection Form

Site: Bld 95 Event #: 16 Date: 9-10-02 Personal: C Springer Weather: Sunny, Hot, Humid

Well ID	Condition	Locked	Labeled	Depth to Water	Total Depth of Well	Comments
MW-NASB-065	Good	Yes	Yes	4.68	15.50	
MW-NASB-066	Good	Yes	Yes	5.67	19.79	
MW-NASB-067	Good	Yes	Yes	4.72	15.00	
MW-NASB-068	Good	Yes	Yes	5.48	15.05	
MW-NASB-097	Good	Not Possible	Yes	4.07	11.05	
MW-NASB-098	Good	Yes	Yes	7.48	16.00	

Additional Comments:

1. Stressed Vegetation -

No signs of stressed vegetation were present at the former Building 95 site.

2. Condition of Geo Textile -

NA

3. Other -

Appendix G

Analytical Report Form I
Data Tables

APPENDIX G

SAMPLE KEY – BUILDING 95
NAVAL AIR STATION, BRUNSWICK, MAINE

Sample Designation	Sample Station
Monitoring Wells	
BN-95-16-MW67	MW-NASB-067
BN-95-16-MW97	MW-NASB-097
BN-95-16-MW98	MW-NASB-098
BN-95-16-MWXD1	MW-NASB-098 - Duplicate

ESS Laboratory

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CHAIN OF CUSTODY

Turn Time ___ Standard (2 Weeks) Other ___
If faster than 5 days, prior approval by laboratory is required # ___

State where samples were collected from: MA RI CT NH NJ NY (ME circled) USACE Other ___

Electronic Deliverables ✓ Yes ___ No
Formats Excel

ESS LAB PROJECT ID 0209123
Special Detection Limits

Co. Name	Project #	Project Name (20 Char. or less)
EA Engineering	29600.47	LTMP Bldg95

Contact Person: Charles Springer
Address: 333 Turnpike Rd
City: Southboro State: MA Zip: 01772 PO#:
Telephone #: 508-485-2982 Fax #: 508-485-5742 Email Address:

Analysis Required: Pesticides 8081A

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Number of Containers	Type of Containers	Pesticides 8081A													
1	9/10/02	1004		x	GW	BN-95-16-MW97	2	G	✓													
2	9/10/02	0900		x	GW	BN-95-16-MW-67	2	G	✓													
3	9/10/02	1005		x	GW	BN-95-16-MW-98	6	G	✓				MS/MSD									
4	9/10/02	—		x	GW	BN-95-16 MWXD1	2	G	✓													

Container Type: P-Poly G-Glass S-Sterile V-VOA
Matrix: S-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present ___ Yes ___ No
Seals Intact ___ Yes ___ No NA: ___
Cooler Temp: 3.6°C

Internal Use Only
[ ] Pickup
[ ] Technicians ___

Comments: Temp blank included

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	9/11/02 1200	[signature]	9/11/02 1205				
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

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CHAIN OF CUSTODY

Page 1 of 1

Turn Time ___ Standard (2 Weeks) Other ___
If faster than 5 days, prior approval by laboratory is required # ___

State where samples were collected from:
MA RI CT NH NJ NY (ME) USACE Other ___

Electronic Deliverables
x Yes ___ No
Formats Access

ESS LAB PROJECT ID

Special Detection Limits

Co. Name	Project #	Project Name (20 Char. or less)
[illegible]	29600.47.154	Southern Boundary

Contact Person	Address
[illegible]	333 Turnpike Rd

City	State	Zip	PO#
[illegible]	[illegible]	01773	

Telephone #	Fax #	Email Address
[illegible]	508-480-5742	

ESS LAB Sample#	Date	Collection Time	COMP	GRAB	MATRIX	Sample Identification (20 Char. or less)	Number of Containers	Type of Containers	Major Hydrazine	Analysis Required
	[illegible]	[illegible]		x	GW	BN-6-95-MW097	2	G	x	MS/MSD
	[illegible]	1553		x	GW	BN-6-95-MW067	2	G	x	
	[illegible]	[illegible]		x	GW	BN-6-95-MW098	2	G	x	DUP

Container Type: P-Poly G-Glass S-Sterile V-VOA

Matrix: S-Solid D-Sludge WW-Waste Water GW-Ground Water SW-Surface Water DW-Drinking Water O-Oil W-Wipes F-Filters

Cooler Present ___ Yes ___ No
Seals Intact ___ Yes ___ No NA: ___
Cooler Temp: ___

Internal Use Only
[ ] Pickup
[ ] Technicians ___

Comments: By EPA Method 6.32 Modified

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[illegible]	1/30/97 1530						
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

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CERTIFICATE OF ANALYSIS

EPA Method 8081A

Client Name: EA Engineering
Client Project ID: LTMP Bldg 95
Client Sample ID: BN-95-16-MW97
Date Sampled: 9/10/02
Analyst: VSC
Date Analyzed: 9/13/02
Date Prepped: 9/12/02

ESS Project ID: 02090123
ESS Sample ID: 02090123-01
Units: µg/L
Dilution: 1
Percent Solid: N/A
Sample Amount: 980 ml

Test Name	Result	MRL	2*MDL
4,4'-DDD	**0.162**	0.102	0.055
4,4'-DDE	ND	0.102	0.053
4,4'-DDT	ND	0.204	0.137
Aldrin	ND	0.102	0.033
alpha-BHC	ND	0.102	0.043
alpha-Chlordane	**0.313**	0.102	0.037
beta-BHC	ND	0.102	0.065
delta-BHC	ND	0.102	0.037
Dieldrin	ND	0.102	0.043
Endosulfan I	**0.1 J, P**	0.1	0.1
Endosulfan II	ND	0.102	0.053
Endosulfan Sulfate	ND	0.102	0.061
Endrin	ND	0.102	0.071
Endrin Aldehyde	ND	0.102	0.069
Endrin Ketone	ND	0.102	0.045
gamma-BHC (Lindane)	ND	0.102	0.049
gamma-Chlordane	**0.134**	0.102	0.037
Heptachlor	ND	0.102	0.037
Heptachlor Epoxide	**0.157**	0.102	0.053
Methoxychlor	ND	0.2	0.1
Toxaphene	ND	5.1	2.04

J = Reported below MRL; Estimated value.
P = Percent difference between primary and confirmation results exceeds 40%.
MDL = Method Detection Limit.
MRL = Method Reporting Limit.
ND = Not Detected above MDL.

Approved By: VSC Date: 9/18/02

MDP

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002

ESS Laboratory

Division of Thielsch Engineering, Inc.

CERTIFICATE OF ANALYSIS

EPA Method 8081A

Client Name: EA Engineering
Client Project ID: LTMP Bldg 95
Client Sample ID: BN-95-16-MW-67
Date Sampled: 9/10/02
Analyst: VSC
Date Analyzed: 9/13/02
Date Prepped: 9/12/02

ESS Project ID: 02090123
ESS Sample ID: 02090123-02
Units: µg/L
Dilution: 1
Percent Solid: N/A
Sample Amount: 1000 ml

Test Name	Result	MRL	2*MDL
4,4'-DDD	ND	0.1	0.054
4,4'-DDE	ND	0.1	0.052
4,4'-DDT	ND	0.2	0.134
Aldrin	ND	0.1	0.032
alpha-BHC	ND	0.1	0.042
alpha-Chlordane	ND	0.1	0.036
beta-BHC	ND	0.1	0.064
delta-BHC	ND	0.1	0.036
Dieldrin	ND	0.1	0.042
Endosulfan I	ND	0.1	0.058
Endosulfan II	ND	0.1	0.052
Endosulfan Sulfate	ND	0.1	0.06
Endrin	ND	0.1	0.07
Endrin Aldehyde	ND	0.1	0.068
Endrin Ketone	ND	0.1	0.044
gamma-BHC (Lindane)	ND	0.1	0.048
gamma-Chlordane	ND	0.1	0.036
Heptachlor	ND	0.1	0.036
Heptachlor Epoxide	ND	0.1	0.052
Methoxychlor	ND	0.2	0.1
Toxaphene	ND	5	2

MDL = Method Detection Limit.
MRL = Method Reporting Limit.

ND = Not Detected above MDL.

Approved By: VAL Date: 9/18/02

MDP

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003

ESS Laboratory

Division of Thielsch Engineering, Inc.

CERTIFICATE OF ANALYSIS

EPA Method 8081A

Client Name: EA Engineering
Client Project ID: LTMP Bldg 95
Client Sample ID: BN-95-16-MW-98
Date Sampled: 9/10/02
Analyst: VSC
Date Analyzed: 9/13/02
Date Prepped: 9/12/02

ESS Project ID: 02090123
ESS Sample ID: 02090123-03
Units: µg/L
Dilution: 1
Percent Solid: N/A
Sample Amount: 990 ml

Test Name	Result	MRL	2*MDL
4,4'-DDD	ND	0.101	0.055
4,4'-DDE	ND	0.101	0.053
4,4'-DDT	ND	0.202	0.135
Aldrin	ND	0.101	0.032
alpha-BHC	ND	0.101	0.042
alpha-Chlordane	ND	0.101	0.036
beta-BHC	ND	0.101	0.065
delta-BHC	ND	0.101	0.036
Dieldrin	ND	0.101	0.042
Endosulfan I	ND	0.101	0.059
Endosulfan II	ND	0.101	0.053
Endosulfan Sulfate	ND	0.101	0.061
Endrin	ND	0.101	0.071
Endrin Aldehyde	ND	0.101	0.069
Endrin Ketone	ND	0.101	0.044
gamma-BHC (Lindane)	ND	0.101	0.048
gamma-Chlordane	ND	0.101	0.036
Heptachlor	ND	0.101	0.036
Heptachlor Epoxide	ND	0.101	0.053
Methoxychlor	ND	0.202	0.101
Toxaphene	ND	5.05	2.02

MDL = Method Detection Limit.
MRL = Method Reporting Limit.

ND = Not Detected above MDL.

Approved By: VSC Date: 9/18/02

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004

ESS Laboratory

Division of Thielsch Engineering, Inc.

CERTIFICATE OF ANALYSIS

EPA Method 8081A

Client Name: EA Engineering
Client Project ID: LTMP Bldg 95
Client Sample ID: BN-95-16 MWXD1
Date Sampled: 9/10/02
Analyst: VSC
Date Analyzed: 9/13/02
Date Prepped: 9/12/02

ESS Project ID: 02090123
ESS Sample ID: 02090123-04
Units: µg/L
Dilution: 1
Percent Solid: N/A
Sample Amount: 990 ml

Test Name	Result	MRL	2*MDL
4,4'-DDD	ND	0.101	0.055
4,4'-DDE	ND	0.101	0.053
4,4'-DDT	ND	0.202	0.135
Aldrin	ND	0.101	0.032
alpha-BHC	ND	0.101	0.042
alpha-Chlordane	ND	0.101	0.036
beta-BHC	ND	0.101	0.065
delta-BHC	ND	0.101	0.036
Dieldrin	ND	0.101	0.042
Endosulfan I	ND	0.101	0.059
Endosulfan II	ND	0.101	0.053
Endosulfan Sulfate	ND	0.101	0.061
Endrin	ND	0.101	0.071
Endrin Aldehyde	ND	0.101	0.069
Endrin Ketone	ND	0.101	0.044
gamma-BHC (Lindane)	ND	0.101	0.048
gamma-Chlordane	ND	0.101	0.036
Heptachlor	ND	0.101	0.036
Heptachlor Epoxide	ND	0.101	0.053
Methoxychlor	ND	0.202	0.101
Toxaphene	ND	5.05	2.02

MDL = Method Detection Limit.
MRL = Method Reporting Limit.

ND = Not Detected above MDL.

Approved By: VSL Date: 9/18/02

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005

November 29, 2002
EA Engineering Science and Technology
Southborough Technology Park
333 Turnpike Road
Southborough, MA 01772

Report Number: 02559
Client Job Number: 29600.47.1549
Sample Matrix: water
Number of Samples: 3

Analytical Report

Ext. Date	Analysis Date	Sample ID	Analyte	Amount Detected	Method Reporting Limit
11/15/02	11/19/02	**BN-6-95-MW097**	Maleic hydrazide	Not detected	4.0 ug/liter (ppb)
11/15/02	11/19/02	**BN-6-95-MW067**	Maleic hydrazide	Not detected	4.0 ug/liter (ppb)
11/15/02	11/19/02	**BN-6-95-MW098**	Maleic hydrazide	Not detected	4.0 ug/liter (ppb)
11/15/02	11/19/02	**BN-6-95-MW098** (Duplicate analysis)	Maleic hydrazide	Not detected	4.0 ug/liter (ppb)

Stephen Thun
Laboratory Director

Appendix H

Historical Summary of Site

APPENDIX H

HISTORICAL SUMMARY OF SITE

H.1 INTRODUCTION

Under Contract No. N62472-92-D-1296, Contract Task Order No. 0047, with Engineering Field Activity Northeast, Naval Facilities Engineering Command, EA Engineering, Science, and Technology, Inc. has been performing long-term monitoring at Building 95 at Naval Air Station (NAS), Brunswick, Maine, since March 1995. NAS Brunswick is located south of the Androscoggin River between Brunswick and Cooks Corner, Maine.

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'-dichlorodiphenyltrichloroethane 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[1]).

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[2]).

H.2 SITE BACKGROUND

In 1994, an LTMP was established for Building 95 (ABB-ES 1994[3]). 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[4]). 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, 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.

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

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.