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AIR NATIONAL GUARD
INSTALLATION RESTORATION PROGRAM

FINAL

TECHNICAL MEMORANDUM

174th Fighter Wing
New York Air National Guard
Hancock Field
Syracuse, NY

February, 1995

Hazardous Waste Remedial Actions Program
Environmental Restoration and Waste Management Programs
Oak Ridge, Tennessee 37831
Managed by MARTIN MARIETTA ENERGY SYSTEMS, INC.
For the U.S. DEPARTMENT OF ENERGY under contract DE-AC05-84-R21400

AIR NATIONAL GUARD
INSTALLATION RESTORATION PROGRAM

TECHNICAL MEMORANDUM: SITE INVESTIGATION CONFIRMATORY SAMPLING AT THE PETROLEUM, OIL, LUBRICATION (POL) AREA & PESTICIDE STORAGE AREA

for

174th Fighter Wing
New York Air National Guard
Hancock Field
Syracuse, NY

General Order No. 91B-99791C
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Submitted to:

AIR NATIONAL GUARD READINESS CENTER
ANDREWS AIR FORCE BASE, MARYLAND

Submitted by:

HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM
MARTIN MARIETTA ENERGY SYSTEMS, INC.

For the:

U.S. DEPARTMENT OF ENERGY

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13. ABSTRACT *(Maximum 200 words)*

This report describes the results and conclusions made from site investigation confirmatory study work performed in June, July, and September of 1994 at two New York Air National Guard Hancock Field sites in Syracuse, New York: the Pesticide Storage Area and the Petroleum, Oil, and Lubricant (POL) Area.

The Pesticide Storage Area once contained an underground storage tank used to store pesticide rinsate. Soil samples collected confirmed the presence of pesticide contamination in site soils, although at near surface levels, suggesting that the UST was not the source. No groundwater contamination was detected. Additional surface soil investigation is recommended to determine the areal extent of surface soil contamination.

The POL Area is the main depot for storage and dispensing of jet fuel at the base. This study confirmed the presence of jet fuel in the groundwater at the site. The presence of PCBs was also confirmed. Results from this study were used to guide a remedial investigation work plan for the POL Area.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFCEE	Air Force Center for Environmental Excellence
ANG	Air National Guard
ANGRC	Air National Guard Readiness Center
ARAR	Applicable or Relevant and Appropriate Requirement
API	American Petroleum Institute
ASTM	American Society of Testing and Materials
AWQC	ambient water quality criteria
BOD	biological oxygen demand
BTEX	benzene, toluene, ethylbenzene, xylenes
CADD	computer assisted design drawing
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Contract Laboratory Program
COC	Chain-of-Custody Chemicals of Concern
CRP	Community Relations Plan
CRQL	Contract Required Quantitation Limit
CS	Confirmatory Study
DD	Decision Document
DDD	p,p'-dichlorodiphenyl dichloroethane
DDE	p,p'-dichlorodiphenyl dichloroethylene
DDT	p,p'-dichlorodiphenyl dichloroethylene

LIST OF ACRONYMS AND ABBREVIATIONS

DERA	Defense Environmental Restoration Act
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOT	Department of Transportation
DQO	data quality objective
DRO	diesel range organics
EB	equipment blank
EIS	Environmental Impact Study
EPA	Environmental Protection Agency
ESI	Engineering-Science, Inc.
FB	field blank
FFS/RM	Focused Feasibility Study/Remedial Measure
FID	flame ionization detector
FONSI	Finding of No Significant Impact
FR	Federal Register
FS	Feasibility Study
FSP	Field Sampling Plan
FW	Fighter Wing
GC	Gas Chromatograph
HAZWRAP	Hazardous Waste Remedial Actions Program
HSP	Health and Safety Plan

LIST OF ACRONYMS AND ABBREVIATIONS

HCl	Hydrogen Chloride
HPLC	High Performance Liquid Chromatography
IRP	Installation Restoration Program
ITIR	Informal Technical Information Document
JP	Jet Propellant
JP-4	Jet Propellant #4
JP-5	Jet Propellant #5
JP-8	Jet Propellant #8
JRB	JRB Associates
KCl	Potassium Chloride
LEL	lower explosive limit
LNAPL	Light Non-Aqueous Phase Liquid
LUFT	Leaking Underground Fuel Tank
MAP	Management Action Plan
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
M&E	Metcalf & Eddy, Inc.
MEMW	Metcalf & Eddy monitoring well
mg/Kg	milligrams per kilogram, equivalent to ppm
mg/L	milligrams per liter, equivalent to ppm
MMES	Martin Marietta Energy Systems

LIST OF ACRONYMS AND ABBREVIATIONS

MW	monitoring well
µg/Kg	microgram per kilogram, equivalent to ppb
µg/L	microgram per liter, equivalent to ppb
MS/MSD	matrix spike/matrix spike duplicate
NAPL	Non-Aqueous Phase Liquid
NET	National Environmental Testing
NTU	national turbidity units
NYANG	New York Air National Guard
NYSDEC	New York State Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
OVA	organic volatile analyzer
Pest	pesticide
PCB	polychlorinated biphenyl
PID	photoionization detector
POL	Petroleum, Oil and Lubricant
ppb	parts per billion, equivalent to µg/L and µg/Kg
PPE	Personal Protective Equipment
P/PCB	Pesticides and Polychlorinated Biphenyls
ppm	parts per million, equivalent to mg/L and mg/Kg
PVC	polyvinyl chloride
QA	Quality Assurance

LIST OF ACRONYMS AND ABBREVIATIONS

QAPP	Quality Assurance Project Plan
QC	Quality Control
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
RM	Remedial Measure(s)
SAIC	Science Applications International Corporation
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act
SAS	Special Analytical Services
SGSP	Soil Gas Survey Plan
SI	Site Investigation
SOP	Standard Operating Procedure
SOW	Statement of Work
SSHP	Site Specific Health & Safety Plan
SVOC	Semivolatile Organic Compounds
TAGM	Technical and Administrative Guidance Memorandum (NYSDEC)
TAL	Target Analyte List
TB	trip blank
TCO	total combustible organics

LIST OF ACRONYMS AND ABBREVIATIONS

TOC	total organic carbon
TPH	total petroleum hydrocarbons
TSS	Total Suspended Solids
ULI	Upstate Laboratories, Inc.
U.S.	United States
USEPA	United States Environmental Protection Agency
VOA	Volatile Organic Analysis
VOC	volatile organic compound
WP	Work Plan

EXECUTIVE SUMMARY

This report describes the results and conclusions made from site investigation confirmatory study work performed in June, July, and September, 1994, at the Pesticide Storage Area and the POL (petroleum, oil, and lubricant) Area at Hancock Field, New York Air National Guard, north of Syracuse, New York. This report was prepared for the Air National Guard Readiness Center (ANGRC) under an agreement by which the U.S. Department of Energy provides technical assistance to the ANGRC. The two areas under investigation in this study are discussed below.

PESTICIDE STORAGE AREA (SITE 6)

The Pesticide Storage Area once contained an underground storage tank (UST) used to store pesticide rinsate generated by cleaning pesticide containers, cleaning equipment used to apply pesticides, and washing down the "entomology shop", which was formerly located on the Site. The tank and the adjacent soil were tested in 1986 and 1987 for pesticide residues. Malathion was detected in the tank at 48 μg/L. Small quantities (less than 1 mg/Kg) of other pesticides were detected in the soil.

A Site Investigation, conducted in 1990, involved the installation of three groundwater monitoring wells and the collection of soil samples from the borings as well as groundwater samples from the wells. Small quantities of pesticides in both soil (less than 50μg/Kg) and the groundwater from one well (less than 10 μg/L) were reported. It was determined that no significant public health or environmental risks were associated with Site 6, and a no-action Decision Document (M&E, 1992) was written.

The New York State DEC (Department of Environmental Conservation), in response to the Decision Document, requested the installation of a background groundwater monitoring well and further soil sampling. These additional investigative activities were conducted during this confirmatory study investigation.

The confirmatory study activities included the installation of three monitoring wells and seven shallow soil borings. Two of the three existing monitoring wells were found to be damaged and were replaced. In response to NYSDEC's comments, a third new well was installed upgradient of the tank location as a background well. The three new wells were sampled along with one existing monitoring well for pesticides using EPA Contract Laboratory methods. No contamination was detected in any of the groundwater samples.

Soil samples were collected from seven shallow soil borings (0-4 feet). The presence of pesticide contamination in site soils was confirmed, however levels were higher than those previously detected. Contamination was greatest in the surface samples collected from 0-2 feet below the surface, suggesting contaminants were introduced from a surface source, and not the UST.

Concentrations exceeded NYSDEC soil cleanup levels in one location for DDT, and in another for dieldrin. Concentrations of up to 4,000 μg/Kg of DDT and 130 μg/Kg of dieldrin were detected. Compounds most frequently detected were 4,4'-DDT, 4,4'-DDD, and 4,4-DDE.

The collection of samples from seven locations on Site 6 was insufficient to determine the horizontal limits of contamination. Consequently, further investigation to determine the areal extent of the pesticide contamination of the surface soil is recommended.

PETROLEUM, OIL, AND LUBRICATION (POL) AREA (Site 15)

The POL Area is currently the main depot for storage and dispensing of jet fuel at the base. Three spills have reportedly occurred at the POL area, including a release of PCBs prior to the 1980s, a release of an estimated 2,000 gallons of jet fuel in 1990, and a more recent, smaller release of jet propellant in June 1994. All of these releases reportedly occurred in the area of the pump house.

There are ten monitoring wells at the site installed as part of previous work. The present study involved sampling groundwater from those ten monitoring wells. Two of the monitoring wells were found damaged. One of these two, the background monitoring well, was deemed unfit to be sampled.

The presence of jet fuel components in the groundwater at the Petroleum, Oil, and Lubrication (POL) Area was confirmed by this study. The horizontal extent of the jet fuel was established, and the contamination has not yet reached the most down-gradient of the existing monitoring wells. This conclusion supports Site Investigation results compiled in 1992 (M&E, 1992). The presence of previously-identified PCBs in the area near the pump house was also confirmed. Although relatively insoluble in water, PCBs were detected in the groundwater sample from one monitoring well in the study area.

Results from this report will be used to guide the remedial investigation of the POL area currently scheduled for Spring 1995. Recommendations include suggestions for locating and installing future monitoring wells.

1.0 INTRODUCTION

The Air National Guard (ANG) has engaged in a wide variety of operations that require the use of industrial chemicals and other hazardous materials. In recognition of potential public health and environmental impacts resulting from these operations, the U.S. Department of Defense (DOD) has implemented the Installation Restoration Program (IRP) to evaluate suspected problems associated with past hazardous waste disposal and spill sites at DOD facilities. The IRP focuses on identifying and cleaning up contamination from past hazardous waste disposal practices and other past activities at military installations.

As part of the IRP, the Air National Guard Readiness Center (ANGRC) has entered into an interagency agreement with the U.S. Department of Energy (DOE) under which DOE provides technical assistance. Martin Marietta Energy Systems, Inc. (MMES), the DOE operating contractor for the Oak Ridge facilities, is responsible for managing this effort under the interagency agreement through its Hazardous Waste Remedial Actions Program (HAZWRAP) Division.

1.1 PURPOSE OF REPORT

The NGB has requested the support of DOE in supplementing investigations at the 174th Fighter Wing (FW), New York Air National Guard (NYANG), located at Hancock Field in Syracuse, New York (the Base). This report summarizes confirmatory study findings at two Base sites: Site 6 - Pesticide Storage Area; and Site 15 - Base Petroleum, Oil, and Lubricant (POL) Area. The confirmatory studies were conducted under the authority of the DOE HAZWRAP as managed by MMES. The technical requirements are described in the scope of work (SOW) (HAZWRAP, 1990) provided by MMES.

The purpose of this document is to summarize the field activities conducted at the POL and Pesticide Storage Areas during the confirmatory study, present the results obtained from the

sampling and analysis conducted, interpret those results, and provide recommendations to guide the further action, if necessary, at the sites.

1.2 REPORT ORGANIZATION

This document is organized according to IRP guidance for an Informal Technical Information Report for a Remedial Investigation (AFCEE ESR, 1991). It provides the following discussions:

Section 2.0 Project Activities identifies general and site-specific objectives for sampling and analysis as well as a chronology and summary of field work, laboratory analyses, and data validation.

Section 3.0 Sampling and Analysis Results reviews field and analytical data and provides an interpretation of these results.

Section 4.0 Conclusions and Recommendations presents a summary evaluation of findings and makes recommendations for any further site activities.

Section 5.0 References contains the list of references cited throughout the report.

The remainder of **Section 1.0 Introduction** provides a description of the installation and a brief history of investigative activities and findings at the two sites, the POL Area and the Pesticide Storage Area.

1.3 INSTALLATION BACKGROUND

1.3.1 Installation Description

Hancock Field, home of the 174th Fighter Wing of the New York Air National Guard, is located approximately 5 miles north-northeast of Syracuse, in Onondaga County in central New York, as shown on Figure 1-1. The facility adjoins Syracuse-Hancock International Airport. It encompasses 359 acres (Radian, 1994) and is situated approximately 415 feet above sea level.

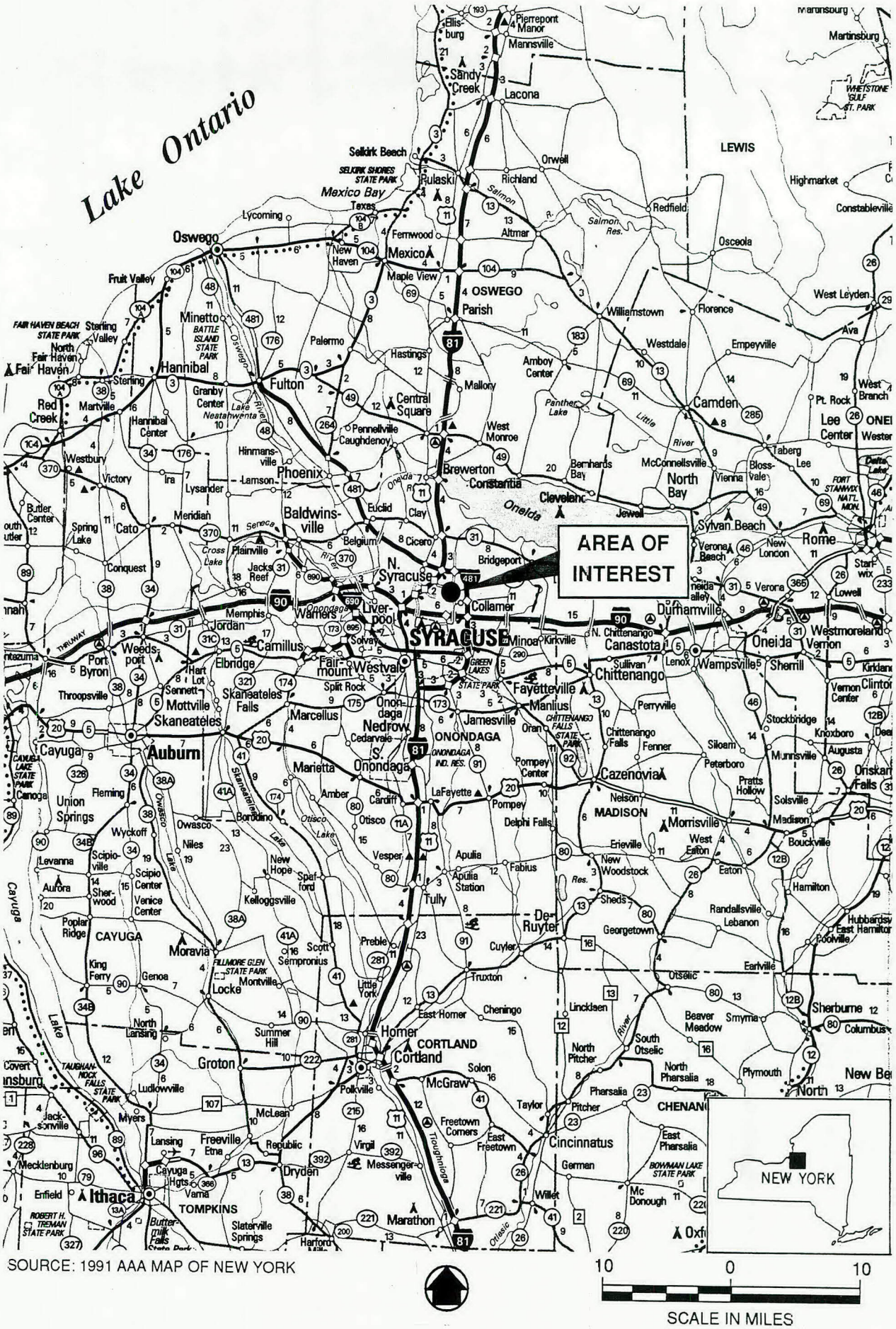


FIGURE 1-1. LOCATION OF HANCOCK FIELD, NEW YORK AIR NATIONAL GUARD, SYRACUSE, NEW YORK

The 174th FW of the NYANG is bordered to the east and south by the town of Dewitt, to the west by the town of Salina, and to the northeast by Syracuse-Hancock International Airport. A map of the Base indicating the location of both the POL Area and the Pesticide Storage Area is presented in Figure 1-2.

Previous work at the sites has been performed for the NGB (ESI, 1982; SAIC, 1989) and also for the Base (Paratt-Wolffe, 1990; ULI, 1990a,b,c). Several documents have discussed in detail background information pertaining to Hancock Field. Specifically:

- The Site Investigation (SI) Management Work Plan (M&E, 1991), section 3.0, provides a description of the installation location and a brief description of each of two sites under investigation (Pesticide Storage Area and POL Area), based on the information available prior to the Site Investigation.

- The SI Field Sampling Plan (M&E, 1991), section 2.0, contains a similar description as well as a summary of investigations conducted at the site prior to the M&E site investigation, and a discussion of the regional geology and hydrogeology.

- The SI Report (M&E, 1992) provides more detail as to the history of land use on both a regional and a site-specific basis. It also provides more detail as to the regional and site-specific geology and hydrogeology discussions.

In addition, the recently-completed IRP Management Action Plan (MAP) (Radian, 1994; Section 3.0, Appendix A) provides an overview of the IRP activities conducted at the Base and at each specific site.

1.3.2 Site 6 - Pesticide Storage Area

1.3.2.1 Site Description. The Pesticide Storage Area is located in an area separate from the current boundaries of the Base, northeast of the Syracuse-Hancock International Airport runways (refer to Figures 1-2). The site lies approximately 100 feet southwest of Building #259 near Bucks Harbor Road. An area of military housing, which is currently occupied, is

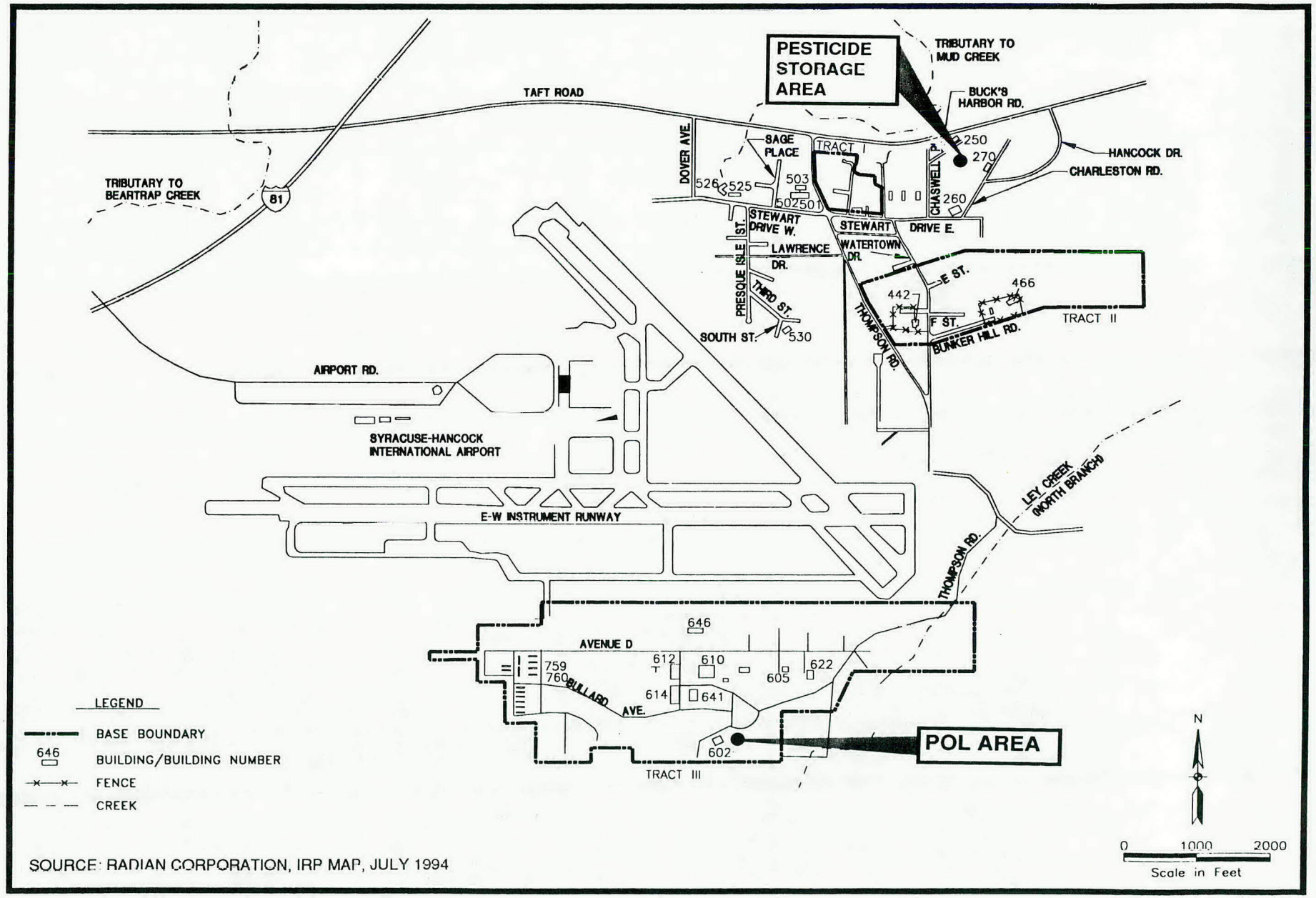


FIGURE 1-2. BASE MAP, HANCOCK FIELD, 174th TFW, NEW YORK AIR NATIONAL GUARD, SYRACUSE, NEW YORK

located approximately 1,000 feet east of the Site. Another residential area is located one-half mile west of the Site.

Site 6 is the former location of a 500-gallon underground concrete holding tank, located near the former entomology shop (formerly Bldg #259), as illustrated in Figure 1-3. The tank was used from 1975 to 1985 (Radian, 1994) to store rinse water from pesticide container and application equipment. The tank is suspected to have leaked into the surrounding soil or groundwater (SAIC, 1986). According to interviews with base personnel, the tank was subject to groundwater infiltration in wet weather and exfiltration during dry weather (Radian, 1994). The tank was removed in November 1989 (Radian, 1994).

1.3.2.2 Previous Investigation Activities. Site 6 was identified in the July 1982 Phase I Records Search (ESI, 1982). The records search report recommended additional investigation of Site 6 based upon the nature of the wastes stored there.

In 1986, as part of the subsequent Phase II, Stage 2 investigation, water in the concrete holding tank was sampled, and shallow (0-3 feet below the surface) soil samples from 20 feet down-slope (southeast) of the tank were taken. Both water and soil samples were analyzed for organochlorine pesticides, organophosphorus pesticides, and organochlorine herbicides. Malathion was measured in the tank contents at 48 μg/L (above the New York State Class GA groundwater standard of 7.0 μg/L); no other pesticides were detected in the tank. Four organochlorine insecticides were detected in down-slope soil at levels up to 170 μg/Kg DDE, 220 μg/Kg DDT, 10 μg/Kg dieldrin, and 2.2 μg/Kg heptachlor epoxide. The most elevated level of contamination was detected in the sample taken nearest to the ground surface. These concentrations were found not to pose a threat to human health or the environment, and no further action was recommended for Site 6 (M&E, 1992a). However, in a letter dated June 6, 1990, the NYSDEC requested that further investigation into the possible presence of pesticides in the groundwater be conducted.

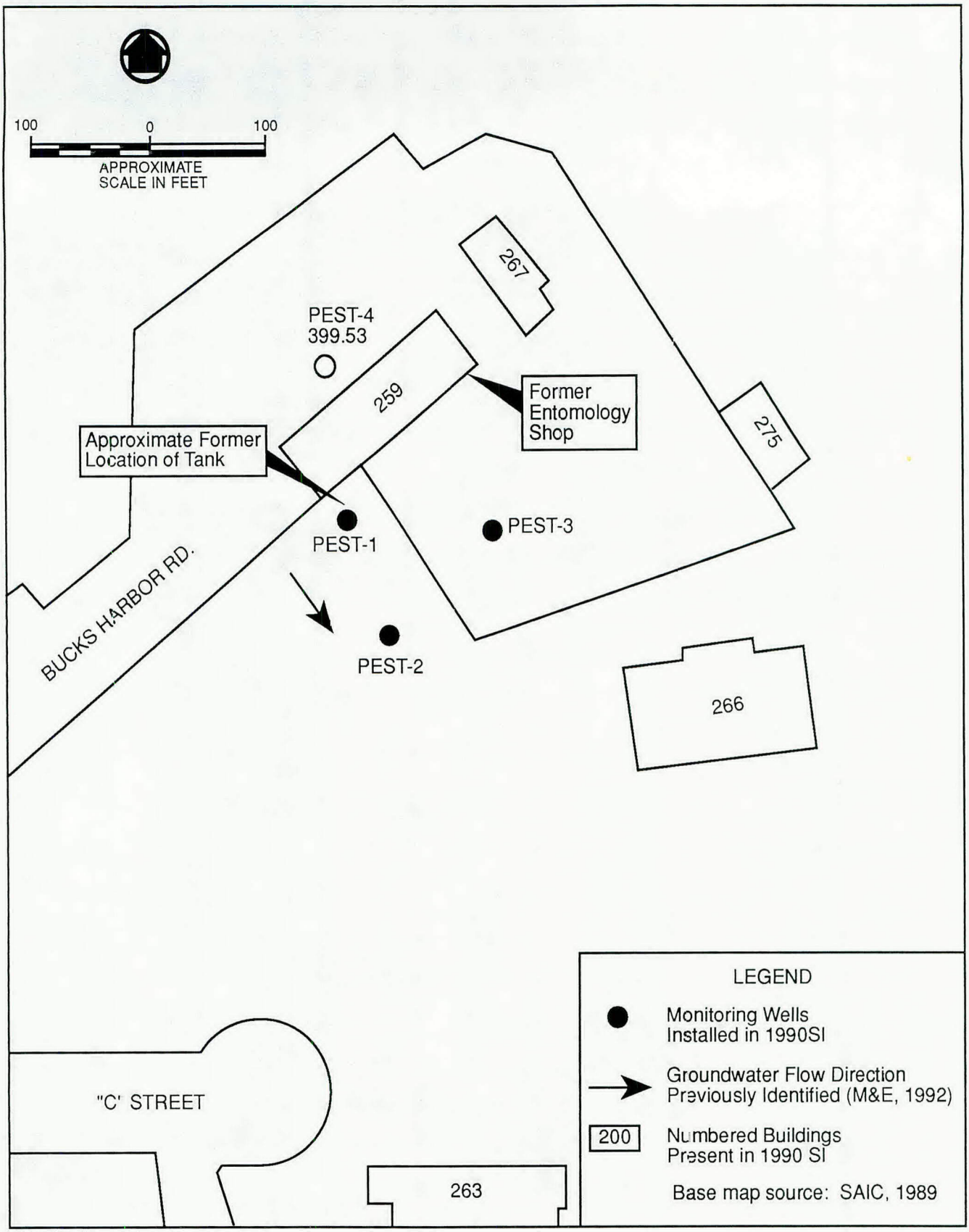


**FIGURE 1-3. PESTICIDE STORAGE AREA,
HANCOCK FIELD, NEW YORK AIR NATIONAL GUARD,
SYRACUSE, NEW YORK**

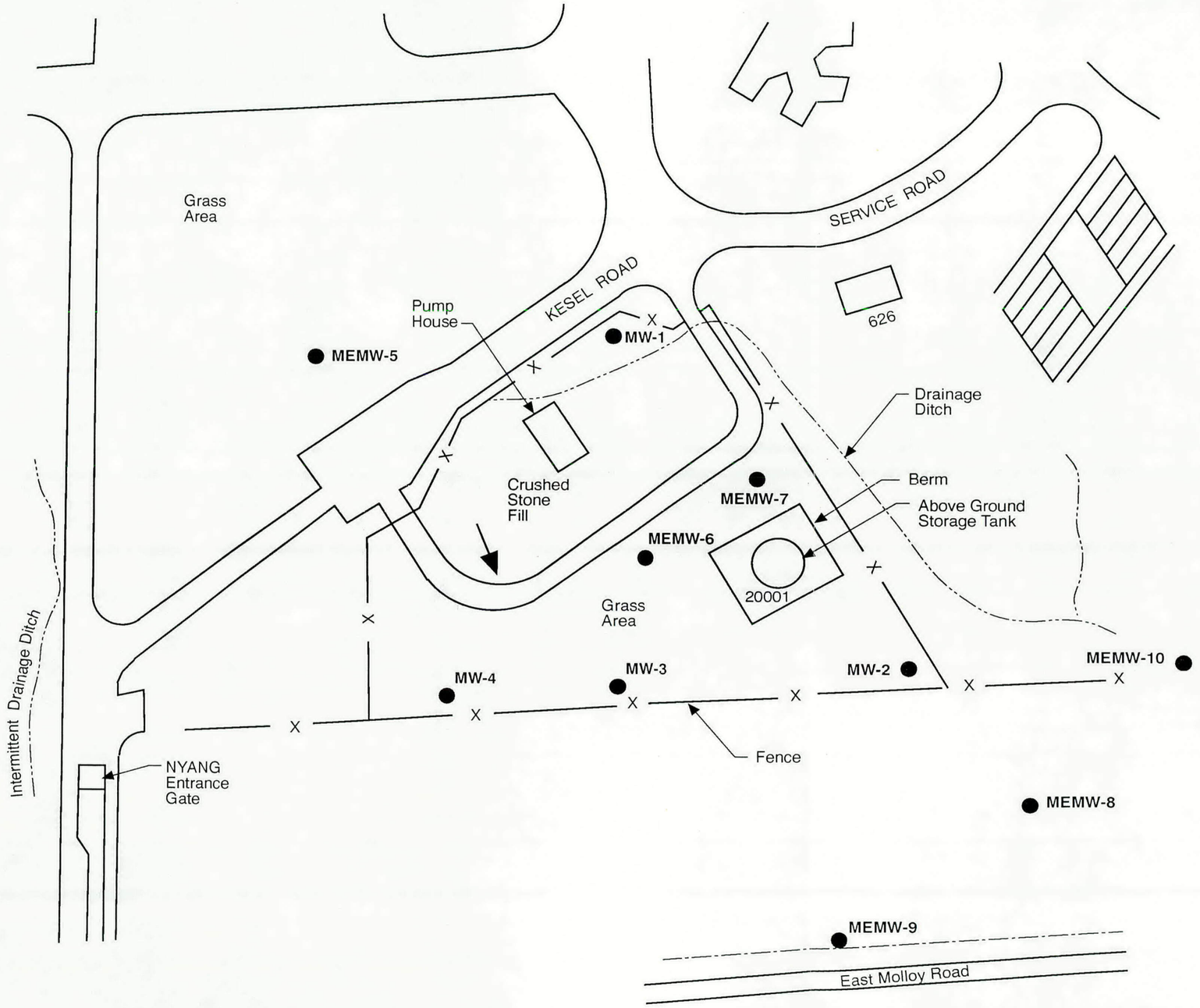
A Site Investigation was conducted in late 1990. Composite soil samples (from 0 - 16 feet below the surface) were collected from three soil borings, and three monitoring wells were installed. DDT and its metabolites, DDD and DDE, were detected in the soil samples at maximum concentrations of 220 μg/Kg, 17 μg/Kg, and 13 μg/Kg, respectively. The same compounds were detected in the unfiltered groundwater collected from one of the three monitoring wells (PEST-3) at concentrations of 6.2 μg/L, 0.35 μg/L, and 4.9 μg/L, respectively. The risk assessment concluded that these concentrations did not pose a threat to human health or the environment, and a Draft Decision Document (DD) was completed in March 1992. The NYSDEC reviewed the Draft DD, and, in a letter dated June 6, 1990, requested additional sampling and the installation of an upgradient monitoring well.

In March of 1994, HAZWRAP directed M&E to conduct further sampling of groundwater and soil at Site 6, in response to NYSDEC's requests, as part of this confirmatory study. The results of this study are discussed in Sections 3.0 and 4.0 of this document.

1.3.3 Site 15 - POL Area

1.3.3.1 Site Description. The POL Area is located within the current boundaries of the NYANG Base, at the Jet Fuel Transfer Pumphouse, Building 602, south of Kesel Road. The site covers 2.5 acres.

The POL Area contains seven tanks containing jet propellant within an area of 2.5 acres (Figure 1-4). The site includes one 215,000-gallon aboveground storage tank (ID #20001), six 25,000-gallon underground storage tanks (ID #021-026), a Jet Fuel Transfer Pumphouse (the pumphouse, Bldg #602), and systems for accepting fuel and delivering fuel to tanks. A portion of each of the six underground tanks are located under the pump building, with a pipe protruding above the ground surface outside of the building where the depth of the fuel in each tank is measured with a large dipstick.



LEGEND

- Monitoring Well
- Groundwater Flow Direction Previously Identified (M&E, 1992)

100 0 100

SCALE IN FEET

FIGURE 1-4.
POL AREA, HANCOCK FIELD,
NEW YORK AIR NATIONAL GUARD,
SYRACUSE, NEW YORK

This site has been in use since 1980 to store petroleum, oil, and lubricants (POL), and is currently scheduled to be decommissioned in 1995, when a new POL Area is scheduled to be constructed.

Three spills have reportedly occurred in this area. The first was a release of PCBs, presumably from transformers at the southeast end of the fuel pump house, which occurred prior to the 1980s. The second was a release of an estimated 2,000 gallons of JP-4 inside the pump house in early 1990. Some of the released fuel reportedly flowed out of the doors of the building. Removal of surface soil thought to be contaminated with jet fuel was conducted, with subsequent backfilling with crushed stone or gravel.

During the cleanup of the second spill, three area drainage sumps containing PCB-contaminated sediment and an oil/water separator (OWS) were discovered (Radian, 1994). The spilled fuel reportedly entered the sumps and mixed with the PCB-contaminated sediment. The contaminated sediment is believed to have collected in the sumps before 1971 (Radian, 1994). The OWS was installed in the 1950s, but was not connected to a holding tank: All product entered into a dry well and eventually drained into the underlying soil (Radian, 1994).

The third and most recent spill occurred on June 12, 1994. Approximately 150 gallons of JP-8 overflowed onto the ground from underground storage tanks located under the northeast side of the building.

1.3.3.2 Previous Investigation Activities. Prior to the JP-4 spill of 1990, the POL Area had not been evaluated in any of the investigations previously conducted at the Base. The 1990 spill precipitated the installation of four monitoring wells in the area, and four sampling events, including groundwater, absorbent pads and aqueous samples from the pump house sump, and soil removed from the spill area. The results of these sampling events showed that soil and groundwater had been contaminated with JP-4 and PCBs, and that further investigation is warranted. Consequently, further investigation of the POL Area, in the form

of a Site Investigation (SI) performed by M&E, was undertaken in the fall of 1990. The results of the 1990 SI are summarized below.

In November and December 1990, PCBs were detected in samples of seepage water taken from inside the pump house and in near-surface soil samples collected from soil borings in the vicinity of the pump house. In the sump seepage water, which was groundwater that was allowed to seep into a cleaned and dryed sump in the pump house, levels of PCBs detected were as high as 120 μg/Kg for Aroclor-1260 and 15 μg/Kg for Aroclor-1254. These results suggested that PCBs were present beneath the pump house. Results for the subsurface soils ranged from non-detectable to 240,000 μg/Kg for Aroclor-1260. PCB contamination was greatest in the areas immediately south and west of the pumphouse. The horizontal and vertical extent of the PCB contamination to the south and east of the pump house were not established, nor was the extent of the PCB-contaminated soil beneath the building determined.

Also in 1990, samples of groundwater, sump seepage water, surface water, and sediment were analyzed for jet fuel contamination. Samples of groundwater, sediment and sump water revealed the presence of petroleum hydrocarbons consistent with a jet fuel source. No hydrocarbons were detected in the surface water. The results obtained from sump seepage water samples indicated that there were hydrocarbons beneath the pump house. Groundwater contamination was greatest in monitoring well MEMW-06, approximately 100 feet down-gradient of the pump house. Concentrations in MEMW-06 included 2.3 mg/L for total petroleum hydrocarbons (TPH), and 3,020 μg/L total for benzene, toluene, ethylbenzene, and xylene (BTEX). Hydrocarbons were also detected in downgradient monitoring wells MW-02 and MW-03, but not in MEMW-09 or MEMW-10. The contemporary horizontal extent of the petroleum contamination in groundwater was thereby defined (Refer to Figure 1-4).

A short-term risk evaluation was performed as part of the SI to determine whether remediation of the site could be postponed until after the POL Area was decommissioned,

which was at that time scheduled for 1994. Since it would be more practical to remediate the area after decommissioning rather than during active operation, the risk evaluation determined that the delay would not result in a significant health risk, provided that precautionary measures were taken, and periodic sampling was conducted.

1.3.4 Environmental Setting

Information as to the regional land use and critical environments present on or near the Base is provided in the IRP Management Action Plan for 174th FW, NYANG (Radian, 1991). Further information as to the critical environments in and around the Base is presented in Section 5.4 and Appendix N of the POL Area SI Report and the Preliminary Ecological Evaluation section of the Pesticide Storage Area SI Report (M&E, 1992).

A detailed description of the environmental setting including the physiographical setting, geology, and hydrogeology, is provided in the Phase II Stage 2 Investigation Report (SAIC, 1989). A brief summary of that information, as well as information obtained during the SI, is provided below.

Hancock Field is underlain by sediments that are primarily glacial in origin. Glacial till overlies shale bedrock (Vernon Formation), and is chiefly responsible for the swell and swale topography of the region. Glaciofluvial sediments overlie the till. Groundwater exists in both the glacial deposits overlying bedrock in a surficial aquifer, and within pore spaces and fracture zones of the Vernon shale as a bedrock aquifer.

In the POL Area, shallow (up to 20 feet) borings installed during the SI revealed fine-grained sediments typical of a glaciofluvial or glaciolacustrine depositional environment. Overburden soils consist generally of tan silt and clay with occasional lenses of fine to medium sand. Water levels have been recorded from approximately three to twelve feet below the surface. Groundwater flow is to the southeast in the direction of North Branch Ley Creek. A groundwater contour map is presented in Figure 1-5. The horizontal hydraulic gradient

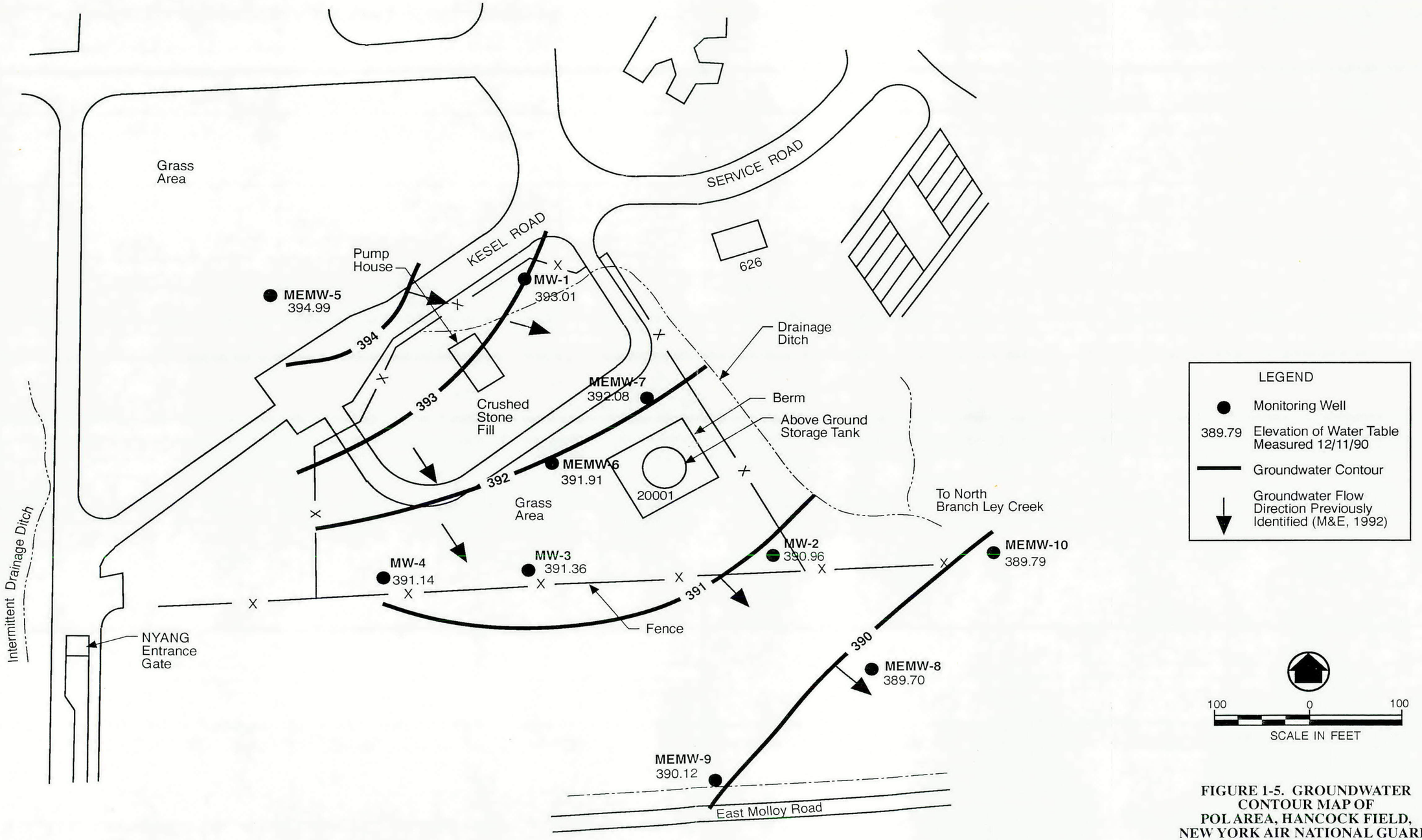


FIGURE 1-5. GROUNDWATER CONTOUR MAP OF POL AREA, HANCOCK FIELD, NEW YORK AIR NATIONAL GUARD, SYRACUSE, NEW YORK

4041/jp

averages 0.008 ft/ft across the POL (M&E, 1992). Slug tests in a fairly similar material a few thousand feet north of the site produced evidence of low hydraulic conductivities ($1.0x10^{-4}$ cm/sec to $1.5x10^{-3}$ cm/sec) (M&E, 1992). The calculated hydraulic conductivities and hydraulic gradients in the area suggest low groundwater flow velocities.

Sediments similar to those in the POL Area were encountered during the installation of soil borings in the Pesticide Storage Area. Groundwater levels have been recorded from approximately three to six feet below the surface. Groundwater flow is to the south according to information obtained during this CS. Low recharge rates suggested that the well yields from the glacial materials would be limited. The approximate horizontal hydraulic gradient across the site is 0.03 ft/ft (M&E, 1992). The hydraulic conductivities and hydraulic gradients in the area suggest low groundwater flow velocities. A groundwater elevation contour map based on information obtained during this CS is presented in Figure 3-1 in Section 3 of this report.

2.0 PROJECT ACTIVITIES

General and site-specific objectives for sampling and analysis are identified in this section.

2.1 PESTICIDE STORAGE AREA - PROJECT OBJECTIVES

The objectives of this confirmatory study with respect to the Pesticide Storage Area are as follows:

- Collect and evaluate field data to verify the nature and extent of pesticide contamination in groundwater and soil as previously determined during the SI and in support of a Technical Memorandum
- Collect and evaluate field data to determine whether a Decision Document can be supported
- Collect and evaluate field data to determine whether further investigation or remediation of the Pesticide Storage Area is necessary

2.2 POL AREA - PROJECT OBJECTIVES

The objectives of the confirmatory study with respect to the POL Area are as follows:

- Collect and evaluate field data to verify the nature and extent of jet propellant contamination in soil and groundwater as previously determined during the SI and in support of a Technical Memorandum
- Collect and evaluate field data in support of the Remedial Investigation

2.3 PESTICIDE STORAGE AREA - FIELD ACTIVITIES

Field activities performed by M&E at the Pesticide Storage Area (Site 6) for the confirmatory study by M&E are summarized in this section. Field sampling procedures are described in detail in the Sampling and Analysis Plan (M&E, 1994). Procedures used which

differed from the Sampling and Analysis Plan are cited in the field change orders and variance letters attached in Appendix E of this report.

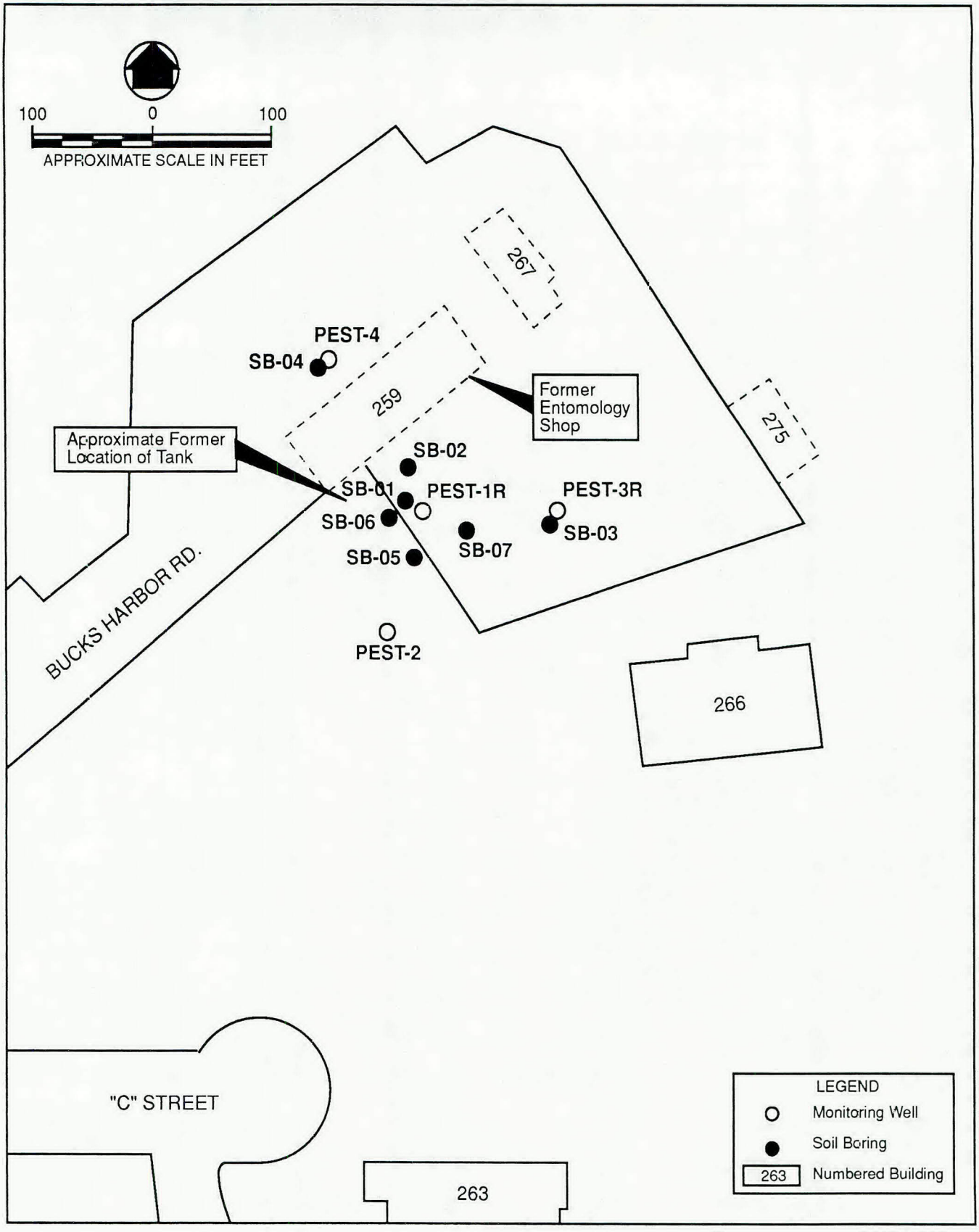
2.3.1 Field Program

This section discusses the confirmatory field work conducted in 1994. Between September 6 and 13, three monitoring wells were installed and seven soil borings were drilled for the purpose of collecting soil samples. Groundwater samples were also collected from the three newly-installed monitoring wells (PEST-1R, PEST-3R, and PEST-4) and one existing monitoring well (PEST-2) on site to determine the current extent of contamination. Monitoring well PEST-1R and PEST-3R were installed to replace two pre-existing wells (PEST-1 and PEST-3) which were damaged. Monitoring well and soil boring locations are presented in Figure 2-1.

Monitoring Well Installation. Three monitoring wells were installed in the former Pesticide Storage Area on September 6 and 7, 1994. Monitoring well installation logs are included in Appendix F.

Monitoring well PEST-4 was installed on the north side of the site; based on groundwater data from the original investigation conducted in 1992, this location had been predetermined to be the upgradient well location. The borehole for monitoring well PEST-4 was advanced to a depth of 16.5 feet below depth. A ten-foot well screen with a #0 Morie sandpack was set at a depth of 15 feet below grade. A two-foot bentonite seal was placed above the sandpack and the remainder of the annulus was sealed to the surface with a cement-bentonite grout and a 5-foot-long locking steel protective casing.

PEST-1R was installed in the approximate vicinity of the former PEST-1 monitoring well. PEST-1 had been destroyed and buried under approximately one foot of soil. Surveyors later located the well so that it could be abandoned properly at a later date. After advancing the borehole to a depth of 16.3 feet below grade, PEST-1R was constructed in the same manner



Base map source: SAIC, 1989

FIGURE 2-1. SAMPLING LOCATIONS, PESTICIDE STORAGE AREA, HANCOCK FIELD, NEW YORK AIR NATIONAL GUARD, SYRACUSE, NEW YORK

as PEST-4. Monitoring well PEST-3R was installed approximately 10 feet east of the damaged well PEST-3. The borehole for monitoring well PEST-3R was advanced to a depth of 17.5 feet, and the well was constructed in the same manner as PEST-4.

Hollow stem augers with a 4¼ inch inner diameter (I.D.) were used to advance the borehole prior to the installation of the wells. The drilling rig and all drilling equipment used in the installation of the monitoring wells was steam cleaned prior to the first boring and each boring thereafter. All decontamination waters were contained in the decontamination pad. These waters were drummed after the final decontamination of the drill rig and equipment. No water was used in the installation of the monitoring wells. The bentonite seals were hydrated with approximately 5 gallons of potable water and allowed to hydrate for at least an hour before grouting the borehole annulus to the ground surface. All newly installed monitoring wells were screened across the water table to allow for the measurement of any free product present. A concrete pad measuring 2-foot square by six inches deep was installed around each of the protective casings. Three steel guard pipes were filled with and set in concrete and placed around each of the three newly-installed monitoring wells.

All hollow stem auger cuttings were screened with a photoionization detector (PID) as they reached the surface. None of the auger cuttings from the three monitoring well borings registered a response on the PID. Auger cuttings from the borings for monitoring wells PEST-1R and PEST-3R were placed into DOT Class 17H drums pending analytical results. For disposal purposes, the cuttings were separated based upon boring and depth. Cuttings taken from 0-4 feet below the surface were separated from the cuttings from 4-16 feet below the surface. Results of the pesticide analyses to be performed on soil samples taken from 0-4 feet below the surface will be used to determine the manner in which the 0-4 foot cuttings will be disposed. For the cuttings from 4-16 feet, composite soil samples were collected from each of the two drums containing auger cuttings from below four feet. A split-spoon sampler was hand driven into each of the drums containing these cuttings in order to collect representative samples of the drum contents for pesticide analysis. Results from these samples will direct the disposal of cuttings from below four feet.

Since PEST-4 was installed in a background location, auger cuttings were assumed to be free of pesticide contamination. Auger cuttings from PEST-4 were, therefore, spread on the ground per instructions of HAZWRAP personnel on site.

Soil Borings. Seven shallow (0-4 feet) soil borings were conducted in the Pesticide Storage Area in early September. (Refer to Figure 2-1). Boring logs are included in Appendix F. Specific soil sampling locations were based on previously-approved general locations selected onsite based on discussions conducted between representatives of Metcalf & Eddy, HAZWRAP, and NYSDEC.

As soil samples were not scheduled to be collected during the installation of the three new monitoring wells, one soil boring was placed adjacent to each monitoring well in order to provide information for the disposal of the soil cuttings from the newly installed wells as well as provide site contamination data. SB-01, SB-03, and SB-04 were placed in the vicinity of the newly installed wells. A fourth soil boring, SB-02, was placed in the approximate former location of the UST. SB-06 was placed at the end of a small wet area downgradient of the former entomology shop. SB-05 and SB-07 were also placed downgradient of the shop approximately midway between SB-03 and PEST-2, for which there was historical sampling information.

Two 2-foot continuous split-spoon soil samples were collected at each of the soil boring locations; one from 0-2 feet below the surface, the second from 2-4 feet below the surface. Split-spoon samplers were screened with the PID upon being removed from the borehole and the soils in the split-spoon were screened upon opening the sampler. There were no responses on the PID from the split-spoon sampler or soils at any of the borings. Soil recoveries and descriptions were recorded before collecting the soils for analysis and are included on the boring logs. At several of the boring locations the split-spoon recoveries were poor, and the drillers were instructed to relocate the boring (less than one foot away) in order to collect sufficient quantities of soil for chemical analysis.

Well Development. All newly-installed monitoring wells were allowed to equilibrate for a minimum of twenty-four hours after completion to allow the grout to set prior to the development. Prior to developing each well, the water level was measured from the top of the PVC well pipe and the volume of standing water in the well was calculated. Upon the removal of each well volume, a sample was collected and measured for temperature, pH, and conductivity. Well volumes were continuously removed until all three parameters had stabilized within 10%. Since the groundwater was extremely turbid (off scale), turbidity was not used as a measure for representativeness. The volume of groundwater purged from monitoring wells PEST-1R, PEST-3R and PEST-4 was 25.5 gallons, 21 gallons and 30 gallons, respectively. All purged groundwater was placed in 55-gallon, DOT Class drums. No free product or sheen was observed in any of the purged waters from the three monitoring wells. Dedicated bailers were left in each well for groundwater sampling.

Overview of Sampling and Measurement Methods. On September 12 and 13, 1994, both unfiltered and filtered groundwater samples were collected from each of the one existing and three newly installed monitoring wells, PEST-1R, PEST-2, PEST-3R, and PEST-4. Upon removal of each well casing cover and PVC cap, PID readings of the well headspace were taken and noted. Measurements of the water level and depth to the well bottom were performed for each well in order to calculate the individual well volumes to be purged. Three well volumes were purged from each of the monitoring wells prior to collecting filtered and unfiltered groundwater samples for pesticide analysis. Groundwater parameters (temperature, pH, conductivity) were measured after the purging of each consecutive well volume. All purge water was placed in labeled 55-gallon DOT 17H or 17E drums stationed at each of the monitoring wells.

Samples were collected from each well using a disposable Teflon bailer and Teflon-coated leader line attached to a nylon rope. Unfiltered and filtered samples were collected from each well. QA/QC samples collected included field duplicates, field blanks, equipment blanks, and extra volume for MS/MSD samples. Samples were placed into previously labelled sample bottles and placed immediately into a cooler containing ice. Samples were

then packaged and shipped overnight to National Environmental Testing, Inc. (NET), the contract laboratory. The groundwater samples were submitted for analysis of pesticides by Contract Laboratory Program (CLP) methods.

Description of Record Keeping Procedures. For each monitoring well sampled, a HAZWRAP monitoring well sampling worksheet was completed with all of the sampling data. In addition, a waterproof field notebook was maintained, and specific information as to chronology, field personnel and visitors, samples collected, instrument calibration and status, phone conversations, and other information according to DOE/HWP-69/RI, "HAZWRAP Quality Control Requirements for Field Methods" (July 1990). A chain-of-custody form was completed for each sample shipment, with one copy enclosed in each of the sample coolers, and one copy retained in a 3-ring binder.

2.3.2 Chronology of Pesticide Storage Area Field Activities

The three monitoring wells in the Pesticide Storage Area were installed during the period of September 6 and 7, 1994. The seven soil borings were conducted on September 7, 1994. Sampling locations were surveyed on September 8, 1994. Monitoring well development was performed on September 8 and groundwater sampling of the monitoring wells was conducted on September 12 and 13, 1994.

2.3.3 Pesticide Storage Area: Field QA/QC

Procedures used in the field were conducted, as described in the confirmatory study Sampling and Analysis Plan (SAP) and the confirmatory study Quality Assurance Project Plan (QAPP) (M&E,1994). These documents were, in turn, prepared according to HAZWRAP guidance as provided in documents DOE/HWP-65RI, 69RI, and 100. The following section presents information as to field QA/QC as well as field changes.

Field QA/QC. The numbers of samples and field QA/QC samples collected for each matrix are presented in Table 2-1, below.

TABLE 2-1.
FIELD QA/QC SAMPLES COLLECTED - PESTICIDE STORAGE AREA

PARAMETER	NUMBER OF SAMPLES	QUALITY CONTROL SAMPLES				TOTAL SAMPLES
		MS/MSD	FIELD DUP	EQUIP. BL.	FIELD BL.	
SOIL						
Organochlorine Pesticides	16	1	2	2	2	23
GROUNDWATER						
Pesticides (Filtered)	4	1	1	1		7
Pesticides (Unfiltered)	4	1	1	1	2	9

The three matrices sampled were soil, unfiltered groundwater, and filtered groundwater. Field duplicates were collected at a frequency of 1 per 10 samples per matrix. One equipment blank was collected for each type of sampling equipment used at a frequency of 1 per 10 samples to be collected with that type of equipment. One matrix spike sample was analyzed for each of the matrices analyzed. Field blanks were collected for all sources of field water used at Site 6. Field blanks of the drillers' well water and the DIUF water used for decontamination were taken during the investigation at Site 6. A field blank of the tap water used for decontamination of the bailers was collected and submitted with the samples from Site 15. Analytical results indicate that none of the field blanks or equipment blanks had pesticide contamination.

Field blanks were collected by pouring the source water directly into the sample bottles. Equipment blanks were collected for each piece of sampling equipment used for the collection of samples when devices other than the sample bottles were required. Equipment blanks were collected by pouring DIUF water through decontaminated sampling equipment and collecting that water directly into the sample bottles. In this manner, equipment blanks were collected for soil sampling equipment, unfiltered groundwater sampling equipment, and filtered groundwater sampling equipment.

Prior to the collection of samples or equipment blanks, the sampling equipment was decontaminated by washing with phosphate-free detergent and tap water, rinsing with tap water, rinsing with DIUF, rinsing with pesticide-grade methanol, and finally rinsing with pesticide-grade hexane.

Field Changes. Field changes or field procedures which differed from those proposed before the initiation of the field work are presented in the following paragraphs. The associated field change request forms submitted for Site 6 are located in Appendix E.

The SAP (M&E, 1994) indicated that soil cuttings would become the property of the NYANG. However, at the request of HAZWRAP and NYSDEC, soil cuttings from the newly installed non-background wells (PEST-1R and PEST-3R) were containerized according to depth. Composite samples of the auger cuttings from the 4 to 15 ft depth intervals were collected to evaluate the presence of pesticides in cuttings taken from below four feet. Results from the analyses of the shallow soil boring samples will be used to direct the disposal of cuttings taken from 0-4 feet below the surface.

The SAP (M&E, 1994) called for the monitoring wells installed at the Pesticide Storage Area to be finished as flush-mounted wells. However, site visits to the Pesticide Storage Area and the POL Area indicated that previously installed flush-mounted wells were difficult to locate and frequently damaged. HAZWRAP representatives and M&E favored the installation of aboveground completed wells. After discussion with the NYANG representative, Mr. T. Sager, the monitoring wells were installed aboveground with protective cement guard posts.

According to the SAP (M&E, 1994), the volume of the well water to be removed from each newly installed monitoring well during development was 3-5 well volumes. Prior to the beginning of field work, NYSDEC requested that 3-5 borehole volumes be withdrawn. During development, it became apparent that, with the extremely low recharge rates encountered, two additional days of field work would be required to remove the updated

volume. A decision was made by M&E to develop each well until the parameters stabilized within 10%, and NYSDEC supported this decision during a phone conversation (September 8, 1994). Each well was developed until parameters stabilized, and at least one borehole volume, approximately 16 to 18 well volumes, was removed from each of the new wells.

2.4 POL AREA - FIELD ACTIVITIES

Field activities performed by M&E at the POL Area (Site 15) for the confirmatory study by M&E are summarized in this section. Field sampling procedures are described in detail in the Sampling and Analysis Plan (M&E, 1994). Procedures used which differed from the Sampling and Analysis Plan are cited in the field change orders and variance letters attached in Appendix B of this report.

2.4.1 POL Area: Field Program

This section discusses field work conducted between June 27 and July 2, 1994 only. All ten of the previously-installed POL Area monitoring wells were located. (Refer to Figure 1-4 for monitoring well locations.) Groundwater sampling was conducted at nine of the ten monitoring wells to determine the current extent of contamination. Background monitoring well, MEMW-05, was not sampled as its physical integrity had been compromised, and deemed unusable.

Overview of Sampling and Measurement Methods. Upon arriving at each existing monitoring well, the condition of the well casing was noted. The cover to the well casing was then removed, if present, followed by removal of the PVC cap, and PID readings of the well headspace were taken immediately. The condition of the well was again noted. Measurements of the water level and depth to the well bottom were performed for each well in order to calculate the individual well volume to be purged. Prior to collecting the samples, a minimum of three well volumes was purged. Temperature, pH, and conductivity

measurements were taken following the purging of each well volume. Additional well volumes were removed if these parameters did not stabilize to within 10%. The first bailer volume was inspected for free-floating product. A final measurement of the water level in the monitoring well was taken after the samples from that well were collected.

Samples were collected from each well using a disposable Teflon bailer and Teflon-coated leader line attached to a nylon rope. Samples were placed into previously labelled sample bottles and preserved in a manner appropriate to the analysis to be performed. The groundwater samples were submitted for analysis of volatile organic compounds and PCBs by Contract Laboratory Program (CLP) methods, and for total petroleum hydrocarbons (TPH) by the California Modified method. Samples collected for volatile organic analyses were collected first, followed by samples for the other two analyses. Samples were kept cool in an ice-filled cooler and were subsequently labelled with sample tags, packaged, and shipped overnight to NET, the contract laboratory.

Description of Record Keeping Procedures. For each monitoring well sampled, a HAZWRAP monitoring well sampling worksheet was completed with all of the sampling data. In addition, a waterproof field notebook was maintained, and specific information as to chronology, field personnel and visitors, samples collection, instrument calibration and status, phone conversations, and other relevant information according to DOE/HWP-69/RI, "HAZWRAP Quality Control Requirements for Field Methods" (HAZWRAP, 1990c). A chain-of-custody form was completed for each sample shipment, with one copy enclosed in each of the sample coolers, and one copy retained in a 3-ring binder.

2.4.2 Chronology of POL Area Field Activities

M&E conducted field reconnaissance and groundwater sampling activities at the POL Area between June 27 and July 2, 1994, inclusive.

2.4.3 POL Area: Field QA/QC

Procedures used in the field were conducted, as described in the confirmatory study Sampling and Analysis Plan (SAP) and the confirmatory study Quality Assurance Project Plan (QAPP) (M&E,1994). These documents were, in turn, prepared according to HAZWRAP guidance as provided in documents DOE/HWP-65RI, 69RI, and 100. The following paragraphs summarize the field QC and provide a description of the field procedures which differed from those discussed in the overview of sampling and measurement methods.

Field QA/QC. The numbers of samples and field QA/QC samples collected for each matrix is presented in Table 2-2, below.

TABLE 2–2.
FIELD QA/QC SAMPLES COLLECTED – POL AREA

PARAMETER	NO. OF SAMPLES	QUALITY CONTROL SAMPLES					TOTAL SAMPLES
		MS/MSD	FIELD DUP	TRIP BL.	EQUIP. BL.	FIELD BL.	
AQUEOUS SAMPLES							
VOC	10	2	1	4	1	2	20
TPH	10	2	1		1	2	16
PCBs	10	2	1		1	2	16

The only matrix sampled was groundwater (unfiltered). Field duplicates were collected at a frequency of 1 per 10 samples per matrix. One equipment blank was collected for each type of sampling equipment used at a frequency of 1 per 10 samples. One matrix spike/matrix spike duplicate sample was analyzed for each of the parameters analyzed. Field blanks were collected for all sources of field water used at the Site. Field blanks of the DIUF water and the tap water from the outside spigot on the pump house in the POL Area used for decontamination were taken during the investigation at the Site. The tap water was also used to decontaminate the bailers used for sampling at the Site.

Field blanks were collected by pouring the DIUF or tap water directly into the sample bottles. Equipment blanks were collected for each piece of sampling equipment used for the collection of samples when devices other than the sample bottles were required, such as bailers, and soil sampling equipment. Equipment blanks were collected by pouring DIUF water through decontaminated sampling equipment and collecting that water directly into the sample bottles.

Prior to the collection of samples or equipment blanks, the sampling equipment was decontaminated by washing with phosphate-free detergent and tap water, rinsing with tap water, rinsing with DIUF water, rinsing with pesticide-grade methanol, rinsing with pesticide-grade hexane, and air drying.

The results of the field QA/QC sample analyses indicated that, with the exception of a tentatively identified fuel oil #6 concentration in the equipment blank, none of the contaminants of interest at the Site were detected in the field QC blanks.

Field Changes. The procedure for purging monitoring well MEMW-06 differed from the procedure described above. A slow recharge rate and a shallow depth of standing water were encountered at MEMW-06, resulting in MEMW-06 being purged to dryness. Samples were collected, with the approval of the HAZWRAP representative, over a seven-hour period after the second well volume was removed.

Procedure for purging monitoring well MEMW-09 also differed from the procedure described in the overview of sampling and measurement methods. Because of extremely slow recharge rates at MEMW-09, the well was allowed to recharge overnight after three well volumes were removed. Samples were collected the following morning.

At MEMW-08 and MEMW-09, the procedure for measuring temperature, conductivity, and pH differed from the procedure described in the overview of sampling and measurement. On June 30, excessive moisture due to frequent heavy rains caused malfunctions in both the

instrument and the backup meter planned for use to measure these parameters. Conductivity was measured at MEMW-08 after the first well volume was removed before the meters became completely inoperable. At this time an estimate of the pH was obtained with pH paper. Temperature was not measured. As no further measurements could be taken, five well volumes were removed prior to sampling to ensure that the samples were representative.

As instruments were not functioning, measurements could not be taken during the purging of MEMW-09. All three parameters were measured prior to sampling the next morning. As the results were comparable to those obtained the last time the well was sampled, samples were collected after the removal of three well volumes.

Information collected during the confirmatory study sampling concerning the state of the existing monitoring wells is summarized below.

Several of some of the flush-mounted monitoring wells installed in and around the POL Area had been damaged since the site investigation was conducted. In MEMW-06, which is located close to the concrete pad in the POL area, the well casing was missing, the well cap dislodged, and the PVC casing disturbed. Although it was possible that some grass and dirt were knocked into the well, the well was sampled at the recommendation of the HAZWRAP representative onsite.

The integrity of the background monitoring well, MEMW-05, was also compromised. The well casing was found lying a few feet from the well, and the well cap was cracked and displaced. Bentonite had migrated up and over the PVC, and had accumulated in the top of the well casing. In addition, the well cap, cracked but still located on the top of the well, was covered with animal excrement. As three to four inches of material had actually accumulated inside of the well itself, the well was not sampled.

Bentonite had also surged up around the PVC in monitoring wells MEMW-08 and MEMW-09. In MEMW-08, the bentonite had moved up to cover the well cap to a depth of

several inches. However, the PVC cap and the lock were intact. The bentonite was removed from the top and sides of the PVC and cap, and the well was sampled. It was also noted that the PVC rotated freely. In MEMW-09, the bentonite did not reach to the top of the PVC casing, and the well was secured.

The bolts which had secured the well casing cap on MW-01 were missing, and there was no lock on the monitoring well cap. Standing water, with a slight sheen, was visible in the shelf on the inside of the road box. Some of the bolts on the remaining monitoring well casings were also damaged, apparently by a lawn mower, but the casing remained secured.

Standing water was also found on the shelf inside of the well casing of MW-02. The casing rotated freely, and hundreds of white insect larvae were visible in the purge water.

The remainder of monitoring wells were found to be secured and in good condition.

2.5 PESTICIDE STORAGE AREA - LABORATORY ANALYSIS

A brief summary of the laboratory program is provided below.

2.5.1 Pesticide Storage Area: Analytical Program

The analytical program for the Pesticide Storage Area involved the collection and analysis of both soil and groundwater samples for pesticides by CLP methods as presented in the 3/90 SOW (U.S. EPA, 1993). Two soil samples were collected from each of seven boreholes, from depths of 0-2 feet and 2-4 feet below the surface. For each monitoring well, one filtered and one unfiltered groundwater sample was collected from each of the four monitoring wells.

All soil and groundwater samples collected, including the field QA/QC samples, were submitted to NET, the same laboratory which had previously analyzed confirmatory study

samples from the POL Area. All of the applicable field QA/QC samples described in the SAP (M&E, 1994) were collected and analyzed. NET performed pesticide/PCB analyses according to the HAZWRAP guidance as provided in provided by the HAZWRAP document DOE/HWP-65RI, HAZWRAP Requirements for Quality Control of Analytical Data (U.S. DOE, 1990d) and the latest CLP methods. The analytical results are summarized in Section 3.3.

2.5.2 Chronology of Pesticide Storage Area Laboratory Analyses

Soil samples were collected by M&E from the Pesticide Storage Area on September 7 and 8, and shipped to the laboratory, NET, on September 8. All soil samples were shipped within twenty-four hours of collection, and received by the laboratory on September 9. Analyses were performed on samples from September 15 through September 21, and the data was received by M&E on October 7.

M&E collected groundwater samples from the Pesticide Storage Area monitoring wells on September 12 and 13. Samples were shipped on the day they were collected, and received by the laboratory on September 13 and 14, respectively. Samples were analyzed from September 12 through September 22, and the data was received by M&E on October 7.

2.5.3 Pesticide Storage Area: QA/QC Program

The quality assurance and quality control (QA/QC) program is described in detail in the confirmatory study QAPP (M&E, 1994). The QAPP was written according to guidance provided by the HAZWRAP document DOE/HWP-65RI, HAZWRAP Requirements for Quality Control of Analytical Data (U.S. DOE, 1990d). All sample analyses performed conformed to these requirements. The data quality is further discussed in Section 2.7 of this report.

2.6 POL AREA - LABORATORY ANALYSIS

A brief summary of the laboratory program is provided below.

2.6.1 POL Area Analytical Program

Groundwater samples were collected from all of the POL Area monitoring wells except MEMW-05, and submitted along with field quality control (QC) samples to National Environmental Testing, Inc. (NET), a laboratory certified by HAZWRAP. NET performed volatile organic and pesticide/PCB analyses by CLP 3/90 methods and total petroleum hydrocarbon (TPH) analyses by the EPA/API Diesel Range Organics (DRO) method, a method similar to the California Modified Method used to analyze for TPH. The DRO method was performed using a JP-4 standard. The primary analytes of concern with respect to the other two methods performed were BTEX (benzene, toluene, ethylbenzene, and xylene) and PCBs. The analytical results and the quality of those results are discussed in this section.

2.6.2 Chronology of POL Area Laboratory Analyses

Samples were collected by M&E on June 28, 29, 30, and July 1. Samples were shipped each night to the laboratory, NET, which received each shipment on the following day. Data was received by M&E from the laboratory on July 25. Data from confirmatory analyses performed by the laboratory with respect to the DRO analyses were received August 17.

2.6.3 POL Area QA/QC Program

Quality assurance and quality control (QA/QC) measures, as described in the confirmatory study QAPP, followed guidance provided by HAZWRAP document DOE/HWP-65RI. No out-of-control events were reported by the laboratory.

2.7 PESTICIDE STORAGE AREA - DATA EVALUATION

The quality of the analytical data from the Pesticide/PCB CLP analysis performed on both the soil and groundwater samples collected from the Pesticide Storage Area is summarized in this section. The data validation and tables are presented in Appendix G.

Samples were collected from the Pesticide Storage Area by M&E and submitted to NET for analysis. Both the soil and groundwater samples were analyzed for pesticides and PCBs according to Contract Laboratory Program (CLP) methods. M&E then conducted a Level C data validation according to DOE/HWP-65/RI, "HAZWRAP Requirements for Quality Control of Analytical Data" (U.S. DOE, 1990c). Because the HAZWRAP document was written for the 2/88 Contract Laboratory Program (CLP) Organic Statement of Work (SOW), M&E incorporated validation actions consistent with the updated or 3/90 Organic SOW. Both the PCBs and the pesticides were validated, although the pesticides were the main concern.

Soil Analyses. Eighteen soil samples and four aqueous field QC samples were submitted to NET for analysis for Pesticides/PCBs according to the CLP method. Data validation was performed by M&E, and no qualification resulting from the validation of the data was necessary. Data qualification performed by the laboratory was reported with the sample results. These included results qualified as estimated (J) by the laboratory because the concentration was below the CLP contract required quantitation limit, or because the difference between the concentrations reported on the two instrument columns exceeded criteria. All field QC blanks collected, field blanks and equipment blanks, were free of pesticide contamination down to the detection limits.

Groundwater Analyses. Fourteen groundwater samples and associated field-QC samples were submitted to NET for analysis for Pesticides/PCBs according to the CLP method. Data validation was performed by M&E, and no qualification of the data was necessary as a result of the validation. As with the soil samples, any qualification applied by the laboratory was

included. Qualifications applied by the laboratory consisted of qualifying as estimated any positive results below the CRQL and any positive results for which the RPD for the concentration reported on the two columns was greater that 25%. All field QC blanks collected, field blanks and equipment blanks, were free of pesticide contamination down to the detection limits.

2.8 POL AREA - DATA EVALUATION

The quality of the analytical data from each of the three analyses performed is summarized in this section. The data validations and tables are presented in Appendix C. Samples were collected from the POL Area, submitted to NET for analysis. For the volatile organic and pesticide/PCB analyses, samples were analyzed according to CLP methods, and validated by M&E. M&E conducted a Level D validation on the analytical data according to DOE/HWP-65/RI, "HAZWRAP Requirements for Quality Control of Analytical Data" (July 1990), which was written for the 2/88 Contract Laboratory Program (CLP) Organic Statement of Work (SOW), and incorporated validation actions consistent with the 3/90 Organic SOW. All compounds were validated, although BTEX and PCBs were the main concern.

Samples were also analyzed for jet propellant by NET according to a modified Environmental Protection Agency/American Petroleum Institute (EPA/API) Diesel Range Organics method. M&E conducted a Level C validation on the analytical data according to DOE/HWP-65/RI, "HAZWRAP Requirements for Quality Control of Analytical Data" (July, 1990). For the DRO analysis, M&E incorporated validation actions consistent with the GC/FID method used by the laboratory.

Volatile Organic Analyses. Seventeen aqueous samples, including four trip blanks, one equipment blank, and two field blanks (organic-free water and tap water), were collected from the POL Area and submitted for volatile organic analysis. All criteria were met with the following exceptions: 1) holding time criteria was exceeded in one instance, sample FLDQC-TB3-06-30-QC-113, by a period of less than 3 hours; 2) response factors for

1,1,2,2-tetrachloroethane fell below criteria for initial and continuing calibrations on one of the three instruments used; however, the compound was not detected in any of the groundwater samples and is not a compound of concern (i.e not BTEX) at this site.

With the exception of contaminants found in the tap water field blank, all contaminants were reported at concentrations below the contract required quantitation limits (CRQLs); 4-methyl-2-pentanone (1 μg/L), methylene chloride (2 μg/L), and 1,1,2,2,-tetrachlorethane (1 μg/L). Higher concentrations of contamination were reported in the tap water field blank: chloroform (32 μg/L), bromodichloromethane (16 μg/L), and dibromochloromethane (8 μg/L). These contaminants are most likely artifacts of the chlorination of that water source. None of the contaminants detected are detected in any field samples, nor are any of them compounds of concern at this site.

PCBs. Thirteen aqueous samples, including one equipment blank and two field blanks (organic-free water and tap water), were collected from the POL Area, and submitted to NET for pesticide/PCB analysis. All criteria with the exception of surrogate recovery and confirmatory column precision met the quality control criteria. Qualification of data based upon surrogate recoveries consisted of qualifying all non-detected results in sample MW-001-06-30-NX-101 as estimated. The positive result for Aroclor-1260 in sample MW-006-06-29-NX-106 was also qualified as estimated; however, this positive result was already estimated because the relative percent difference for recovery of the compound on the two columns was greater than criteria, and because the concentration was below the CRQL.

Diesel Range Organics. Thirteen aqueous samples, including one equipment blank and two field blanks (organic-free water and tap water), were collected from the POL Area, submitted to NET for DRO analysis.

The EPA/API Diesel Range Organics method performed by NET used JP-4 as a standard. Peak areas were integrated over the C8-C15 range defined by that standard. Consequently, the results reported reflect the quantity of jet propellant and fuels of a similar nature, and do

not include quantitation of the heavier oils and lubricants. Later eluting peaks, which were not included in the quantitation of the JP-4 concentration, were noticed in the samples from monitoring wells MEMW-06, MW-04, and MW-03. Confirmatory GC/MS analysis performed by the laboratory revealed this pattern of late eluting peaks to be consistent with that resulting from Fuel Oil #6. A approximate estimate of the fuel oil concentrations was calculated.

All criteria were met, however some contamination was detected in the equipment blank, FLDQC-EB1-06-29-QC-114. Although the peak pattern of this chromatogram did not match that of the JP-4 standard, the peaks were in the integration range, and a decision to qualify the data was made. As a result of the blank contamination, the result reported for sample MW-003-06-29-NX-103 was qualified as non-detected.

3.0 SAMPLING AND ANALYSIS RESULTS

The sampling and analysis results presented below will be used to interpret data and to develop numerical estimates of risk posed by contaminants at the areas under investigation.

3.1 PESTICIDE STORAGE AREA - REVIEW OF FIELD AND LABORATORY DATA

The data collected during the confirmatory study investigation of the Pesticide Storage Area includes the results of analyses for pesticides in both soil and groundwater samples. Soil samples were collected from seven shallow soil borings. Groundwater sampling included both filtered and unfiltered samples. All samples, both soil and groundwater, were analyzed for pesticides by EPA CLP methods. Field data included measurements of groundwater levels, pH, temperature, and conductivity.

Soil samples were collected from two depths (0'-2' and 2'-4') from each of the seven boreholes which were installed in the Pesticide Storage Area. In addition, two soil samples were taken from drums containing the soil cuttings from the 4'-16' depth from the newly installed monitoring wells PEST-3R and PEST-1R. These samples were collected to provide information for disposal of the soil cuttings. These samples were analyzed and validated along with the soil boring samples. The results are presented in Appendix F.

Only one of three pre-existing Pesticide Storage Area monitoring wells, PEST-2, was found intact. The other two, PEST-1 and PEST-3, were replaced (PEST-1R and PEST-3R), and a background monitoring well (PEST-4) was installed. All four groundwater monitoring wells were sampled.

All samples were received and analyzed for pesticides by the subcontract laboratory, NET. Level C data validation of the analytical data obtained from the laboratory revealed very few problems. None of the data needed to be qualified due to actions taken during data

validation. Qualifications made by the lab consisted of estimated positive results that were below detection limits and estimating results with poor precision between GC columns. Several positive results were qualified as estimated because of the latter. These are noted as estimated in the text.

3.2 POL AREA - REVIEW OF FIELD AND LABORATORY DATA

The data obtained for the confirmatory study conducted at the POL Area includes elevated concentrations of PCBs and petroleum-related contaminants, specifically BTEX and jet propellant, in the groundwater collected from the POL area monitoring wells. Field data included measurements of groundwater levels, pH, temperature, and conductivity.

The background monitoring well, MEMW-05, was not sampled. Consequently, no information as to current background (upgradient) contamination is available. All other POL area monitoring wells were sampled.

All samples were received and analyzed by the laboratory. In analytical data obtained from the laboratory for volatile organic (BTEX), one trip blank was analyzed three hours outside of holding time; the blank results were qualified accordingly. No problems with the PCB analytical data were encountered.

In analytical data obtained for the DRO analyses for jet propellant, the detection limit was elevated for the results from one monitoring well (MW-03) because of contamination in the equipment blank collected. Additional analyses using GC/MS were conducted to identify contaminants in the DRO analysis which were not attributed to jet propellant.

3.3 PESTICIDE STORAGE AREA - DATA SUMMARY

The field and laboratory data obtained from Site 6 during this investigation are summarized in this section. Field data collected consists of water quality parameters as well as

hydrogeological data obtained during well installation and sampling. Laboratory data consists of soil and groundwater sampling results obtained from analysis for pesticides.

3.3.1 Field Data

A summary of the field data collected by M&E from the Pesticide Storage Area during the confirmatory study sampling is presented in Table 3-1. Information presented includes the well depth, depth to groundwater, as well as groundwater appearance, pH, conductivity, and temperature. Monitoring well sampling worksheets and soil boring logs are located in Appendix F.

The pH readings from each of the four monitoring wells were within the normal groundwater range (pH 5-8). Conductivity ranged from 560 to 1140 μmhos. A comparison of the well parameters measured in this study with those measured during the SI indicates that the pH and conductivity at PEST-2 have not changed significantly since 1990.

Geology and Hydrology. Seven soil borings were conducted in the Pesticide Storage Area to a depth of four feet. Three monitoring wells were installed in the Pesticide Storage Area to a depth of 15 feet below grade. The borings for these monitoring wells were advanced to depths ranging between 16 and 17.5 feet below grade. Soils encountered in the borings consisted of sand and gravel fill overlying outwash sands and silt with some to little clay. The fine-grained sediments are typical of a glacio-lacustrine depositional environment. No glacial till or bedrock was encountered in any of the borings.

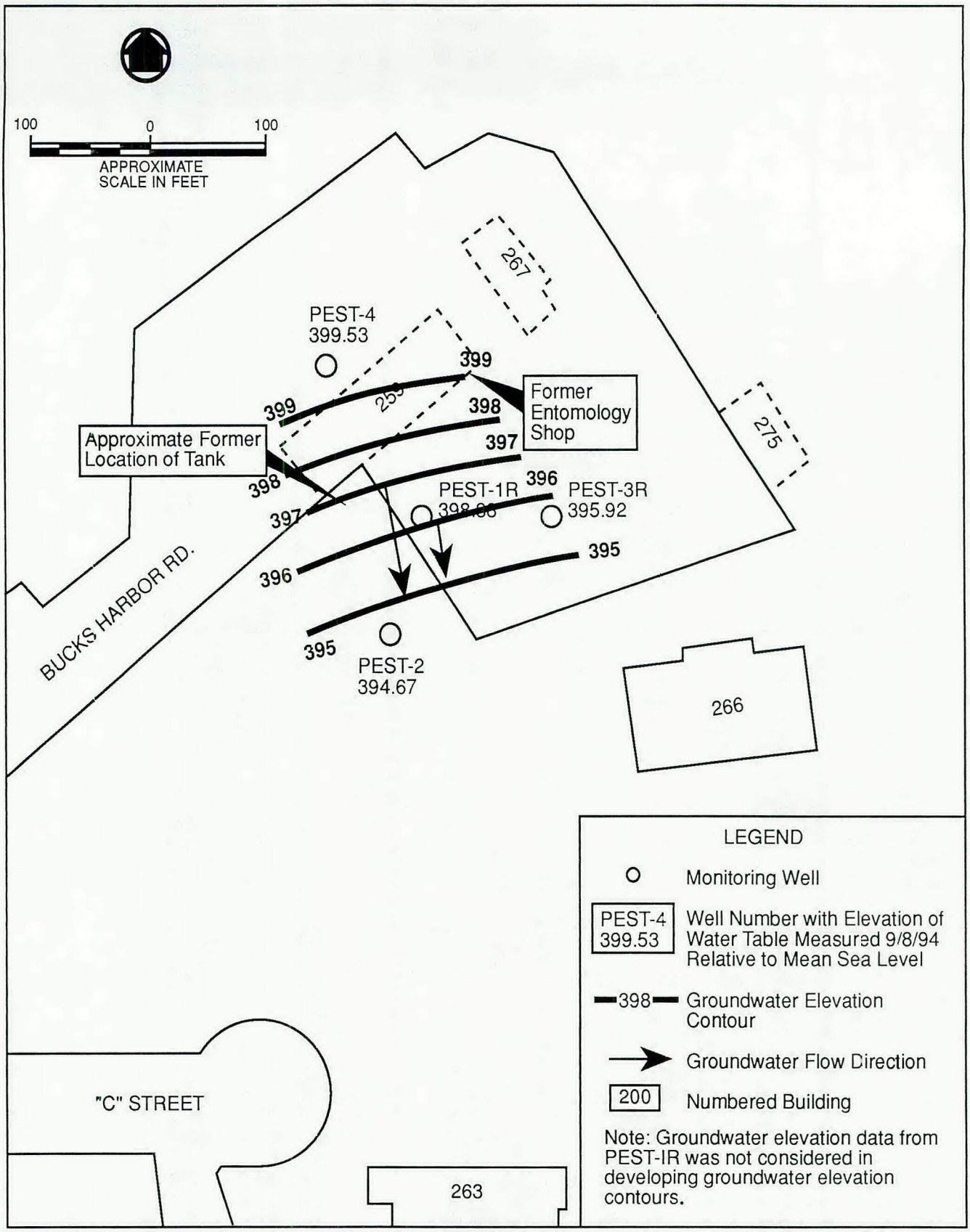
A groundwater contour map is presented in Figure 3-1. Groundwater levels in the newly-installed monitoring wells ranged between 4.71 and 6.98 feet below grade. The overall direction of groundwater flow across the site is to the southeast. Based on groundwater elevation data, the approximate horizontal hydraulic gradient across the site is 0.03 ft/ft. Recharge rates during the development of the three newly-installed monitoring wells were slow, suggesting low yields from the surficial aquifer. All three wells were bailed dry with

TABLE 3-1. SUMMARY OF FIELD DATA: PESTICIDE STORAGE AREA

WELL LOCATION	DATE SAMPLED	DEPTH TO WELL BOTTOM (FEET)	DEPTH TO GROUND-WATER (FEET)	GROUNDWATER ELEVATION (FEET)	PID Well (ppm)	RECHARGE	FINAL pH	FINAL COND (umhos/cm)	FINAL TEMP (°C)	GROUNDWATER APPEARANCE
PEST-1R	9-12-94	18.42	9.41	398.88	0	slow	7.35	688	13.7	no odor; silty; brown silt; PID = 0
PEST-2	9-13-94	14.85	10.25	394.67	0	v. slow	7.53*	560*	12.6*	no odor; silty; red-brown silt; PID = 0
PEST-3R	9-12-94	18.68	10.34	395.92	0	slow	7.08	1140	16.0	no odor; silty; red-brown silt; PID = 0
PEST-4	9-12-94	18.52	10.51	399.53	0	slow	6.90	1017	16.0	no odor; silty; brown silt; PID = 0

NOTES:

All wells are overburden wells with 2" internal diameter.
All depths were measured from top of PVC.
Groundwater elevation given is in feet above mean sea level.
* Readings reported from measurement taken after 3rd well volume was removed.



Base map source: SAIC, 1989

FIGURE 3-1. GROUNDWATER CONTOUR MAP, PESTICIDE STORAGE AREA, HANCOCK FIELD, SYRACUSE, NEW YORK

the removal of 9 gallons or less during well development. No free product was observed in any of the three monitoring wells developed.

Water quality data collected during the previous investigation (SAIC, 1989), revealed that the groundwater has elevated concentrations of iron, calcium and magnesium. Neither the surficial nor bedrock aquifer is a source of drinking water. Drinking water supplies in the vicinity of Hancock Field consist exclusively of surface water (SAIC, 1989).

3.3.2 Pesticide Storage Area: Laboratory Results

The analytical results are discussed in this section. The soil and groundwater results are discussed separately. The significance of these results is presented in Section 3.8. A tabulation of the positive results detected in soil samples is presented in Table 3-2, and spatially in Figure 3-2. No tabulation of the groundwater results is presented as no positive results were reported by the laboratory for either filtered or unfiltered samples. The results for all of the compounds, whether detected or not, is presented along with the data validation in Appendix G.

3.3.2.1 Soil Boring Samples. A tabulation of compounds detected in the soil boring samples is presented in Table 3-2. Pesticides, primarily 4,4'-DDT, were detected in eleven of the fourteen soil boring samples collected, in all of the samples collected from the 0'-2' depth, and in four of the seven samples collected from the 2'-4' depth. Other compounds detected include 4,4'-DDD, 4,4'-DDT, dieldrin, endosulfan sulfate, methoxychlor, alpha-chlordane, and gamma-chlordane.

The compounds detected most frequently were 4,4'-DDT (DDT) and its metabolites 4,4'-DDD (DDD) and 4,4'-DDE (DDE). DDT was detected in all but one of the soil samples which had pesticides reported (see above). DDD and DDE were detected in all but three of the soil samples which had pesticides reported. Either DDT or one of its metabolites was detected in each sample which had contaminants reported.

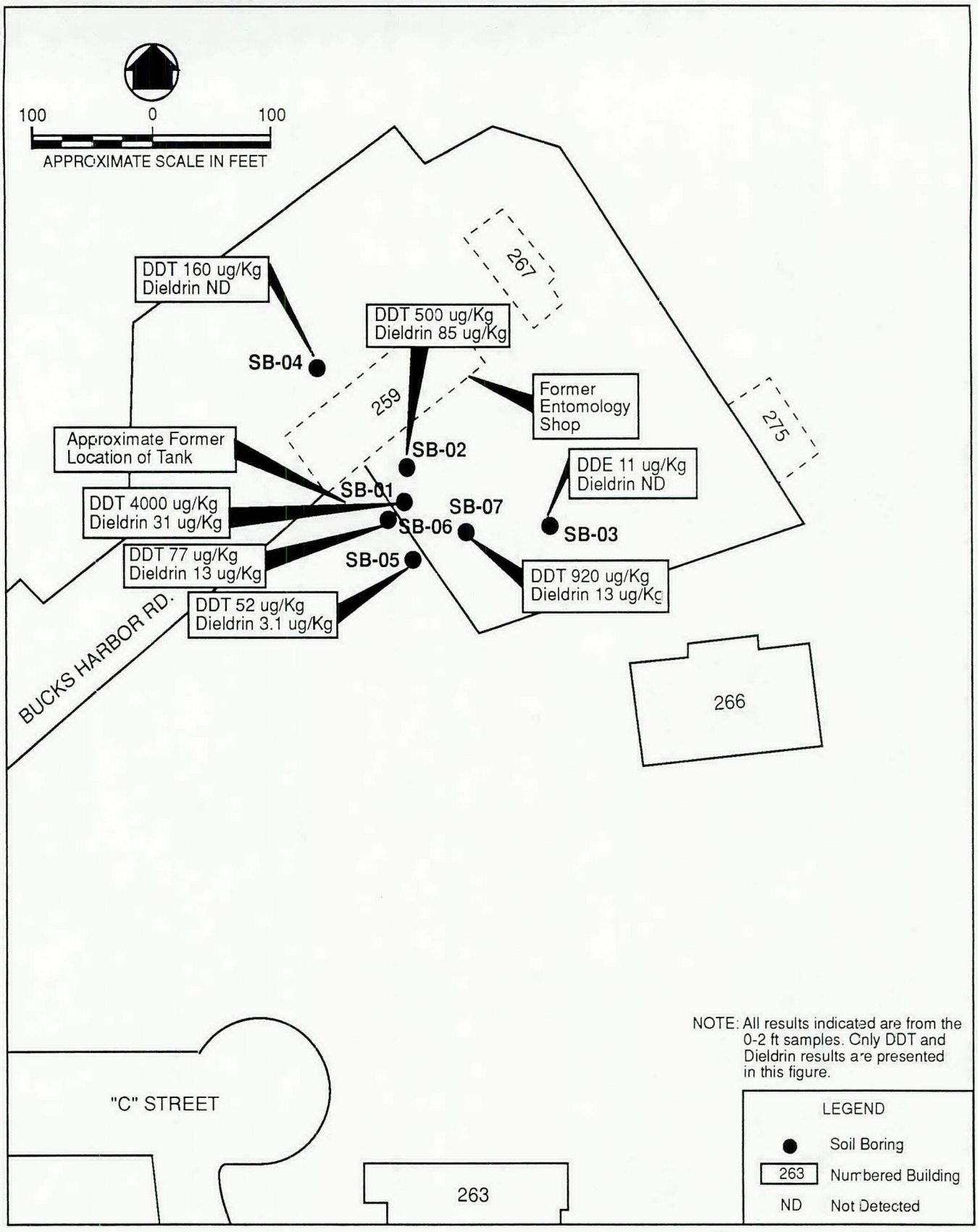


FIGURE 3-2. PESTICIDES CONTAMINATION, SOIL BORINGS, PESTICIDE STORAGE AREA, HANCOCK FIELD, NEW YORK AIR NATIONAL GUARD, SYRACUSE, NEW YORK

TABLE 3–2. ANALYTICAL RESULTS: PESTICIDE STORAGE AREA – SOIL

SAMPLE LOCATION:		NYSDEC	SB–1			SB–2		SB–3		SB–4	
DATE SAMPLED:		CLEANUP	09/07/94			09/07/94		09/07/94		09/07/94	
SAMPLE DEPTH (ft):		OBJECTIVE	0–2	0–2 (1)	2–4	0–2	2–4	0–2	2–4	0–2	2–4
COMPOUND	CRQL (µg/Kg)	(µg/Kg)									
Heptachlor Epoxide	1.7	20	--	--	--	--	--	--	--	--	--
Dieldrin	3.3	44	31	36 J	--	85	1.4 J	--	--	--	--
4,4'–DDE	3.3	2100	390	500	12	72 J	--	11	--	74	2.6 J
4,4'–DDD	3.3	2900	96 J	110 J	--	78 J	3.7 J	3.0 J	--	32 J	3.0 J
Endosulfan Sulfate	3.3	900	12 J	--	--	23 J	8.0 J	--	--	6.0 J	--
4,4'–DDT	3.3	2100	3400	4600	110	500	18	--	--	160	8.9
Methoxychlor	17.0	10000	--	--	--	5.5 J	--	--	--	--	--
alpha–Chlordane	1.7	540	--	--	--	--	--	--	--	--	--
gamma–Chlordane	1.7	100	--	--	--	--	--	--	--	--	--
TOTAL PESTICIDES		10000	3929	5246	122	764	31	14	--	272	15

SAMPLE LOCATION:		NYSDEC	SB–5		SB–6			SB–7	
DATE SAMPLED:		CLEANUP	09/07/94		09/07/94			09/07/94	
SAMPLE DEPTH (ft):		OBJECTIVE	0–2	2–4	0–2	2–4	2–4 (1)	0–2	2–4
COMPOUND	CRQL (µg/Kg)	(µg/Kg)							
Heptachlor Epoxide	1.7	20	--	--	8.4 J	--	--	--	--
Dieldrin	3.3	44	3.1 J	--	13	--	--	140	--
4,4'–DDE	3.3	2100	120	--	98	--	--	350	--
4,4'–DDD	3.3	2900	15 J	--	4.9 J	--	--	830 J	5.2 J
Endosulfan Sulfate	3.3	900	5.0 J	--	--	--	--	130 J	--
4,4'–DDT	3.3	2100	52	--	77	--	--	920	7.7
Methoxychlor	17.0	10000	--	--	--	--	--	--	--
alpha–Chlordane	1.7	540	6.5 J	--	5.6 J	--	--	5.6 J	--
gamma–Chlordane	1.7	100	3.1 J	--	1.5 J	--	--	--	--
TOTAL PESTICIDES		10000	205	--	208	--	--	2376	--

Footnotes:

NYSDEC – New York State Dept. of Environmental Conservation

CRQL –Contract Required Quantitation Limit

J – Quantitation is approximate due to the limitations identified in the quality control review.

-- – Not Detected

Result exceeds NYSDEC soil cleanup objectives (NYSDEC, 1994)

The highest concentrations reported were for 4,4'-DDT (DDT) and its metabolites 4,4'-DDD and 4,4'-DDE. Concentrations for 4,4'-DDT ranged from 4000 μg/Kg to non-detected, where the CRQL (CLP contract required quantitation limit) is 3.3 μg/Kg. Concentrations of 4,4'-DDE were as high as 500 μg/Kg. Concentrations of 4,4'-DDD were as high as 830 μg/Kg (estimated).

Pesticide concentrations were most elevated in the samples collected from the 0'-2' depth. The highest concentration of DDT detected was in the sample collected from the 0'-2' depth of SB-01 (4000 μg/Kg or 4 ppm - average of sample and field duplicate). Concentrations of DDT were also in the ppm range for the 0'-2' samples from SB-07 (920 μg/Kg, 0.92 ppm), and SB-02 (500 μg/Kg, 0.5 ppm). The DDT concentrations reported for the samples taken from 0'-2' in the remaining boreholes were somewhat lower: SB-04 had 160 μg/Kg, SB-05 had 52 μg/Kg, SB-06 had 77 μg/Kg. The shallow samples from SB-03 had no DDT detected, but DDE and DDD were detected at concentrations of 11 and 3.0 μg/Kg, respectively.

DDT contamination was also detected in three samples collected from the 2'-4' foot depth. Two of these, SB-01 and SB-07, coincided with the most contaminated samples from the 0'-2' depth. The third DDT detection from 2'-4' was reported for SB-04. SB-01 had the highest, 110 μg/Kg. SB-04 and SB-07 had similar, but much lower concentrations (9 and 8 μg/Kg, respectively). All three samples had much lower concentrations than the 0'-2' sample from the same borehole.

Dieldrin and endosulfan sulfate were also detected in SB-01, SB-02, SB-05, SB-06, and SB-07 at 0'-2' and in SB-02 at 2'-4'. Concentrations were similar and highest in SB-07 (0'-2') for both compounds (140 μg/Kg - dieldrin, 130 μg/Kg -endosulfan sulfate).

Alpha- and gamma-chlordane were detected at concentrations less than 10 μg/Kg in a few boreholes in the 0'-2' samples. Both compounds were detected in SB-05 and SB-06, and

alpha-chlordane was detected in SB-07. Concentrations ranged from 2 to 7 μg/Kg, and most were estimated (J).

Heptachlor epoxide and methoxychlor were each detected at concentrations less than 10 μg/Kg in one of the samples collected from the 0'-2' range. Heptachlor epoxide was detected in SB-06 at 8 μg/Kg, and methoxychlor was reported at 6 μg/Kg in SB-02.

3.3.2.2 Groundwater Samples No pesticides were detected in any of the groundwater samples, either filtered or unfiltered, which were collected from the Pesticide Storage Area groundwater monitoring wells during this confirmatory study. The CLP aqueous quantitation limit for the contaminants most frequently detected in the soil boring samples; 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE, is 0.10 μg/L.

3.3.3 Comparison of Pesticide Storage Area Field and Laboratory Data

None of the field measurements conducted at the Pesticide Storage Area measured pesticide concentrations, nor was there any other field measurement which could be compared to the analytical results from the laboratory. Consequently, no comparison is possible.

3.4 POL AREA - DATA SUMMARY

A summary of the field data collected by M&E from the POL Area during the confirmatory study sampling is presented in Table 3-3. The monitoring well sampling worksheets are located in Appendix C.

Most of the pH readings were within the normal groundwater range (pH 5-8). The pH for MW-03 was higher at pH 8.62. The pH measurements were similar to those obtained during the SI (within 20%). This excludes wells MW-03 and MEMW-8, for which final measurements could not be obtained. A pH of 6.9 was reported for the SI for MW-03 and MEMW-08.

TABLE 3-3. SUMMARY OF FIELD DATA: POL AREA

WELL LOCATION	DATE SAMPLED	DEPTH TO BOTTOM (FEET)	DEPTH TO WATER (FEET)	PID Well (ppm)	RECHARGE	FINAL pH	FINAL COND (umhos)	FINAL TEMP (°F)	GROUND WATER APPEARANCE
MW-1	06-30-94	16.56	7.84	386	v. good	6.98	525	61.0	clear; small amounts of black floc.; max. bailer PID = 48 ppm
MW-2	06-30-94	13.52	10.96	0	good	7.01	349	57.2	colorless; clear; hundreds of ~1/8" live white larvae
MW-3	06-29-94	13.56	11.06	0	slow	8.62*	647*	59.4*	petroleum odor; slight sheen; clear; black precipitate ~30 s. after removal
MW-4	06-29-94	18.46	11.20	0	slow	8.03	471	62.1	clear w/orange silt
MEMW-6	06-29-94	14.62[1]	12.52[1]	0	ext. slow	7.80	846	64.0	sulfide and petroleum odors (2nd bailer PID=47 ppm); black color; dirt, insect
MEMW-7	06-28-94	14.52[1]	11.82[1]	1.7	ok	6.96	572	61.5	clear; orange floc. precipitate; some silting due to shallowness
MEMW-8	06-30-94	14.82[1]	10.08[1]	0	good	5**	579**	**	clear; colorless; orange silt
MEMW-9	06-30-94	13.32[1]	8.76[1]	0	ext. slow	6.92	1280	62.2	colorless; turbid; silty; brown/black silt
MEMW-10	07-01-94	16.58	7.72	0	ok	7.27	535	60.9	clear; silty; heavy orange silt

NOTES: All wells are overburden wells with 2" internal diameter.
Unless otherwise noted, depth was measured from top of casing.

[1] Depths were measured from top of PVC.

* Final not measured due to meter malfunctions. Readings reported from measurement taken after 3rd well volume was removed.

** Final not measured due to meter malfunctions. Readings reported from measurement taken after 1st well volume was removed. Five well volumes purged to ensure representativeness.

With the exception of two monitoring wells, the conductivity readings ranged from 350 to 650 μmhos. The conductivity for MEMW-09 was higher at 1280 μmhos. As this monitoring well is closest to the road, the elevated conductivity could be the result of road salt and other road runoff. The conductivity for MEMW-06 was also high at 846 μmhos, which could again be a result of being located near the concrete pad of the POL area.

Conductivity readings agreed to within 20% of the results obtained during the SI, with the exception of MW-2 (349 μmhos as opposed to 450 μmhos during the SI) and MEMW-10 (535 μmhos as opposed to 760 μmhos during the SI).

3.4.1 POL Area: Laboratory Results

The analytical results are discussed in this section on a well-by-well basis. The significance of these results is discussed in Section 3.5. Positive sample results for all analyses are presented in Table 3-4, and are arranged spatially in Figure 3-3. The results for all compounds, whether detected or not, are presented along with the data validation in Appendix D.

MW-01. No positive results were detected for BTEX, PCBs or jet propellant in any of the three analyses performed, although PID readings of 390 ppm and 50 ppm were obtained in the well headspace and bailer headspace, respectively. No free product or sheen was observed.

MW-02. Ethylbenzene was reported at 480 μg/L and total xylenes were reported at 1200 μg/L. Several aliphatic and aromatic compounds from C6 through C9 were tentatively identified in the volatile organic analysis. The estimated total TIC concentration, which consisted primarily of aromatic compounds, was 2000 μg/L. Jet propellant concentration was reported at 3130 μg/L. No PCBs were detected.

TABLE 3–4. ANALYTICAL RESULTS: POL AREA – GROUNDWATER

MONITORING WELL ID:		MW–1	MW–2	MW–3	MW–4	MW–6
M&E SAMPLE ID:		MW–001–06–30–NX–101	MW–002–06–30–NX–102	MW–003–06–29–NX–103	MW–004–06–29–NX–104	MEMW–006–06–29–NX–106
COMPOUND	CRQL (µg/L)					
VOLATILE ORGANICS						
Methylene Chloride	10	––	––	––	––	––
1,2–Dichloroethene(total)	10	––	––	19 J	––	––
Chloroform	10	––	––	––	––	––
2–Butanone	10	––	––	––	––	––
Bromodichloromethane	10	––	––	––	––	––
Dibromochloromethane	10	––	––	––	––	––
Benzene	10	––	––	180	––	460
Toluene	10	––	––	––	––	7 J
Ethylbenzene	10	––	480	47 J	––	150
Total Xylenes	10	––	1200	30 J	––	390
PESTICIDES AND PCBs						
Aroclor 1260	1	––	––	––	––	0.62 J
JETFUEL	100	––	3130	––	––	1550
Tentatively Identified Fuel Oil	––	––	––	30**	100**	200**
DATE SAMPLED:		06/30/94	06/30/94	06/29/94	06/29/94	06/29/94
REMARKS:						

MONITORING WELL ID:		MW–7	MW–7 DUP	MW–8	MW–9	MW–10
M&E SAMPLE ID:		"MEMW–007–06–28–NX–107	MEMW–007–06–28–FD–125	MEMW–008–06–30–NX–108	MEMW–009–07–01–NX–109	MEMW–010–06–30–NX–110
COMPOUND	CRQL (µg/L)					
VOLATILE ORGANICS						
Methylene Chloride	10	––	––	––	––	––
1,2–Dichloroethene(total)	10	––	––	––	––	––
Chloroform	10	––	––	––	––	––
2–Butanone	10	––	10	––	––	––
Bromodichloromethane	10	––	––	––	––	––
Dibromochloromethane	10	––	––	––	––	––
Benzene	10	140	160	––	––	––
Toluene	10	6 J	6 J	––	––	––
Ethylbenzene	10	400	420 *	––	––	––
Total Xylenes	10	300	320 *	––	––	––
PESTICIDES AND PCBs						
Aroclor 1260	1	––	––	––	––	––
JETFUEL	100	2890	3150	––	––	––
Tentatively Identified Fuel Oil	––	––	––	––	––	––
DATE SAMPLED:		06/28/94	06/28/94	06/30/94	07/01/94	06/30/94
REMARKS:			Field Duplicate			

Footnotes:

CRQL – Contract Required Quantitation Limit.

J – Quantitation is approximate due to limitations identified in the quality control review.

NA – Not Analyzed

* – Value is reported from the diluted analysis.

** – Concentrations are estimated.

TABLE 3–4 (Cont'd). ANALYTICAL RESULTS: POL AREA – GROUNDWATER

MONITORING WELL ID: / M&E SAMPLE ID: / COMPOUND	CRQL (µg/L)	TRIP BLANK 1 FLDQC–06–28–TB–111	TRIP BLANK 2 FLDQC–TB2–06–29–QC–112	TRIP BLANK 3 FLDQC–TB3–06–30–QC–113	TRIP BLANK 4 FLDQC–TB4–07–01–QC–126	FIELD BLANK DIUF FLDQC–FB1–06–29–QC–115
VOLATILE ORGANICS						
Methylene Chloride	10	1 J	1 J	2 J	––	2 J
1,2–Dichloroethene(total)	10	––	––	––	––	––
Chloroform	10	––	––	––	––	––
2–Butanone	10	––	––	––	––	––
Bromodichloromethane	10	––	––	––		––
Dibromochloromethane	10	––	––	––	––	––
Benzene	10	––	––	––	––	––
Toluene	10	––	––	––	––	––
Ethylbenzene	10	––	––	––	––	––
Total Xylenes	10	––	––	––	––	––
PESTICIDES AND PCBs						
Aroclor 1260	1	NS	NS	NS	NS	––
JETFUEL	100	NS	NS	NS	NS	––
Tentatively Identified Fuel Oil	––	NS	NS	NS	NS	––
DATE SAMPLED:		06/28/94	06/29/94	06/30/94	07/01/94	06/29/94
REMARKS:		Trip Blank	Trip Blank	Trip Blank	Trip Blank	Field Blank

MONITORING WELL ID: / M&E SAMPLE ID: / COMPOUND	CRQL (µg/L)	FIELD BLANK TAP FLDQC–FB2–06–30–QC–116	EQUIPMENT BLANK FLDQC–EB1–06–29–QC–114
VOLATILE ORGANICS			
Methylene Chloride	10	––	––
1,2–Dichloroethene(total)	10	––	––
Chloroform	10	32	
2–Butanone	10	––	––
Bromodichloromethane	10	16	––
Dibromochloromethane	10	8 J	––
Benzene	10	––	––
Toluene	10	––	––
Ethylbenzene	10	––	––
Total Xylenes	10	––	––
PESTICIDES AND PCBs			
Aroclor 1260	1	––	––
JETFUEL	100	––	113
Tentatively Identified Fuel Oil	––	––	––
DATE SAMPLED:		06/30/94	06/29/94
REMARKS:		Field Blank	Equipment Blank

Footnotes:

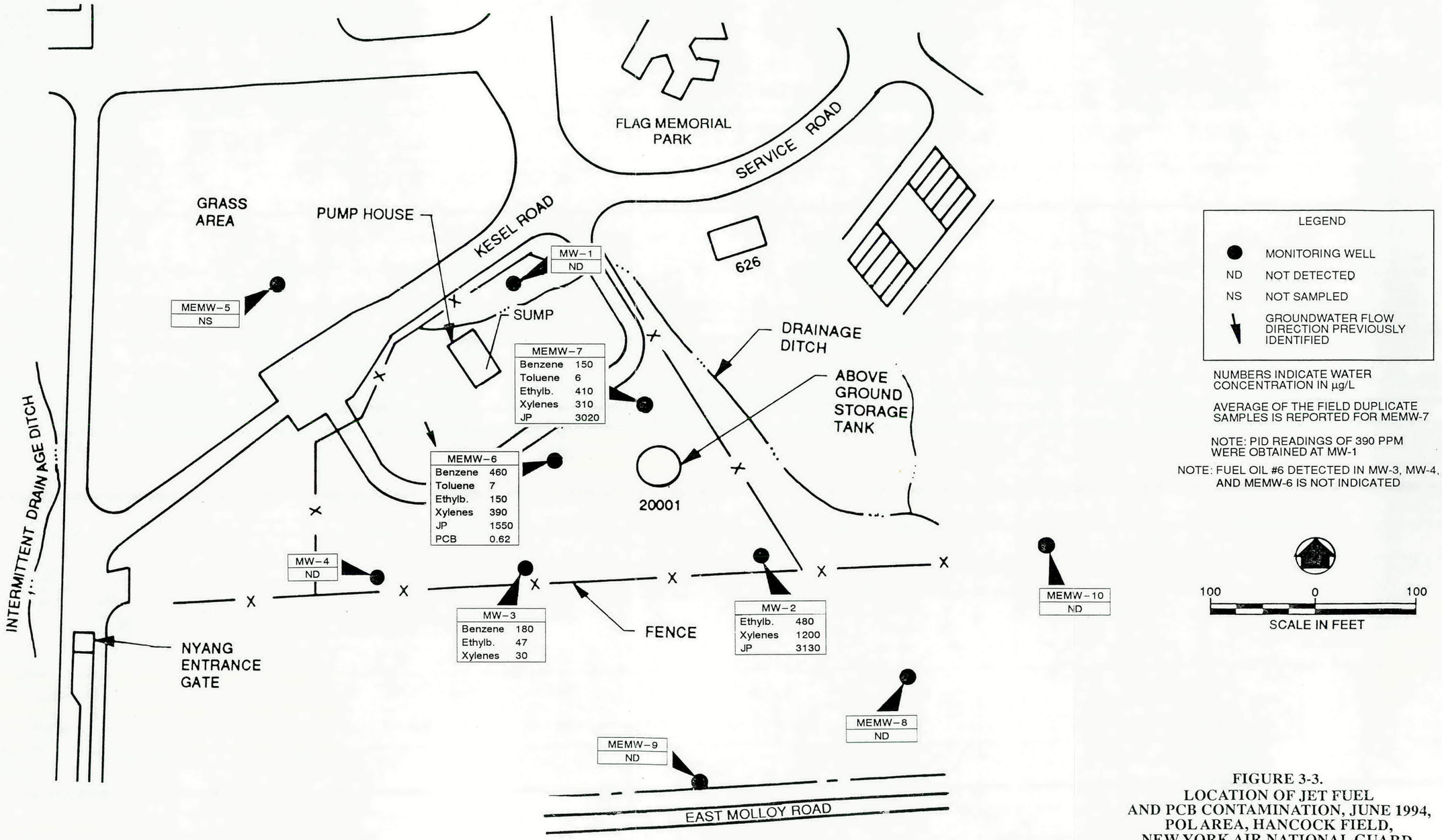
CRQL – Contract Required Quantitation Limit.

J – Quantitation is approximate due to limitations identified in the quality control review.

NA – Not Analyzed

* – Value is reported from the diluted analysis.

** – Concentrations are estimated.



LEGEND

- ● MONITORING WELL
- ND NOT DETECTED
- NS NOT SAMPLED
- GROUNDWATER FLOW DIRECTION PREVIOUSLY IDENTIFIED

NUMBERS INDICATE WATER CONCENTRATION IN µg/L

AVERAGE OF THE FIELD DUPLICATE SAMPLES IS REPORTED FOR MEMW-7

NOTE: PID READINGS OF 390 PPM WERE OBTAINED AT MW-1

NOTE: FUEL OIL #6 DETECTED IN MW-3, MW-4, AND MEMW-6 IS NOT INDICATED

100 0 100

SCALE IN FEET

FIGURE 3-3.
LOCATION OF JET FUEL AND PCB CONTAMINATION, JUNE 1994, POL AREA, HANCOCK FIELD, NEW YORK AIR NATIONAL GUARD, SYRACUSE, NEW YORK

MW-03. Benzene was detected at 180 μg/L, ethylbenzene at 47 μg/L, and total xylenes at 30 μg/L. Cyclohexane was tentatively identified at an estimated concentration of 70 μg/L. The detection limit for the jet propellant analysis was elevated (376 μg/L) due to equipment blank contamination. A concentration of 30 μg/L of fuel oil #6 was estimated. PCBs were not detected.

MW-04. No volatile organics, jet propellant, or PCBs were detected in this sample. However, a concentration of approximately 100 μg/L of fuel oil #6 was tentatively identified by GC/MS analysis as discussed in the section on DRO data quality.

MEMW-05. As discussed in the section on field data, this background monitoring well was not sampled as the integrity of the well was severely compromised, and the sample collected would not have been representative of groundwater conditions.

MEMW-06. Benzene (460 μg/L), toluene (7 μg/L), ethylbenzene (150 μg/L), and total xylenes (390 μg/L) were all detected. The toluene concentration was estimated (J) as it was below the quantitation limit. Volatile organic TICs detected consisted largely of aromatic compounds, and concentrations totalled 300 μg/L. Jet propellant was detected at 1550 μg/L, and approximately 200 μg/L of Fuel Oil #6 was reported. While PID readings from the well headspace were 0 ppm, readings obtained from the bailer headspace were as high as 47 ppm. Aroclor-1260 was estimated at a concentration of 0.62 μg/L, below the quantitation limit (1 μg/L). The PCB result was also estimated due to low surrogate recovery and poor precision with the confirmatory column. Thus this result may be biased low. This was the only PCB detected in any of the samples collected.

MEMW-07. The field duplicate was collected at this monitoring well, and the precision was well within criteria. Positive results were reported for benzene (140 μg/L and 160 μg/L), toluene (6 μg/L and 6 μg/L), ethylbenzene (400 μg/L and 420 μg/L), and total xylenes (300 μg/L and 320 μg/L) were reported for volatile organics. 2-Butanone was detected at the quantitation limit at 10 μg/L in one sample, and was undetected in the other. Jet propellant

was detected at similar concentrations (2890 μg/L and 3150 μg/L) in both samples. PID readings were obtained from the well headspace at 2 ppm. No PCBs were detected.

MEMW-08. No positive results were detected for any of the three analyses performed.

MEMW-09. No positive results were detected for any of the three analyses performed.

MEMW-10. No positive results were detected for any of the three analyses performed.

3.4.2 Comparison of POL Area Field and Laboratory Data

PID readings indicted the presence of volatile organic gases in the headspace of two monitoring wells, MW-01 (390 ppm) and MEMW-07 (2 ppm). While contamination was reported by the laboratory for the sample from MEMW-07, none was reported for the sample from MW-01. It is possible that the most recent spill of JP-8, which flowed out of tanks under the northeast side of the pump house, has saturated the soil in the vicinity the monitoring well, but has not yet reached the groundwater. This would likely result in elevated PID readings in the vadose zone with no detection in the groundwater.

3.5 PESTICIDE STORAGE AREA - BACKGROUND LEVELS

In an effort to measure background contaminant levels at the Pesticide Storage Area, a monitoring well (PEST-4) was installed in an area believed to be upgradient of the former location of the underground rinsate tank. A groundwater contour map is presented in Figure 3-3. Groundwater samples were collected from this monitoring well. Soil samples were collected from a boring (SB-04) placed approximately three feet from the monitoring well.

Soil samples from SB-04 indicated that contamination is present in the soil from 0'-2' below the ground surface. Contaminants included 4,4'-DDT and its metabolites, 4,4'-DDD and 4,4'-DDE, at concentrations of 160 μg/Kg, 32 μg/Kg (estimated, J), and 74 μg/Kg,

respectively. Groundwater samples collected from this monitoring well did not indicate pesticide contamination, nor did any of the other groundwater samples collected from the site during the confirmatory study.

The background monitoring well was sited so as to be hydrogeologically upgradient of the former location of the underground pesticide rinsate storage tank. Placement was based on the assumption that the source of the site contamination was the former underground pesticide rinsate tank. However, the contamination detected in the soil samples taken from the vicinity of the monitoring well indicate a level of contamination comparable to that detected in soil samples from the downgradient area (Refer to Table 3-2).

The presence of higher contaminant levels in the soil samples collected from 0'-2' than in the samples collected from 2'-4' suggests that the source of contamination detected in the soil samples is may not be the underground storage tank. Rather, the contamination is more likely the result of other activities conducted in the vicinity of the former entomology shop.

The presence of pesticide contamination in all of the soil samples collected from 0'-2' may indicate that these chemicals were applied, perhaps sprayed, to the ground and surface vegetation in order to control insects.

As the location chosen for the upgradient soil sample is not significantly farther from the former location of the shop than the other sampling locations, it does not provide background information for the contamination detected. It is, however, a useful site sample. If pesticides were spread over the area, a background sample would be more difficult to obtain, and would have to be collected farther from the site.

3.6 POL AREA - BACKGROUND LEVELS

No current information with respect to background levels of contamination could be obtained as the integrity of the background monitoring well, MEMW-05, was severely compromised

and could not be sampled. Background samples from MEMW-05 taken in 1990 did not indicate any jet propellant detections. As noted above, SI groundwater samples were not analyzed for PCBs.

3.7 PESTICIDE STORAGE AREA - IDENTIFICATION OF SITE CONTAMINANTS

This section discusses the pesticide contaminants detected at the Pesticide Storage Area. A comparison of the results to the NYSDEC 1994 recommended soil cleanup objectives is also presented.

3.7.1 Site Contaminants

Samples of surface soil (0'-4' below the surface) and groundwater were collected from the Pesticide Storage Area during this confirmatory study and analyzed for pesticides according to CLP methods. Pesticide contaminants were detected only in the soil samples, no contamination was detected in either filtered or unfiltered groundwater samples. Site contaminants consisted mainly of 4,4'-DDT and its metabolites, 4,4'-DDD, and 4,4'-DDE. Other compounds detected include dieldrin, endosulfan sulfate, methoxychlor, alpha-chlordane, and gamma-chlordane.

3.7.2 Comparison to NYSDEC Soil Cleanup Objectives

NYSDEC recommended soil cleanup objectives (NYSDEC, 1994) for 4,4'-DDT and dieldrin were exceeded in soil samples collected during this confirmatory study. Specifically, the NYSDEC cleanup objective of 2,100 μg/Kg for 4,4'-DDT was exceeded in the sample collected from SB-01 at 0'-2'. The result for this compound, when the results of the sample and its duplicate were averaged, was 4,000 μg/Kg for 4,4'-DDT. The NYSDEC cleanup objective of 44 μg/Kg for dieldrin was exceeded in the sample collected from SB-07 at 0'-2'. The result reported was 140 μg/Kg.

3.8 POL AREA - IDENTIFICATION OF SITE CONTAMINANTS

Groundwater contaminants identified during the confirmatory study include BTEX, PCBs, and hydrocarbons indicative of jet propellant. Fuel oil #6 was also tentatively identified as a contaminant. The spatial distribution of the contaminant concentrations detected in each of the monitoring wells sampled is presented in Figure 3-2.

3.8.1 POL Area: Petroleum Contamination

Contamination related to petroleum was detected in the monitoring wells immediately to the southeast of the pump house (MEMW-06 and MEMW-07), and extends in that direction as far as the POL Area fence (MW-02 and MW-03), but not as far southeast as the monitoring wells beyond the POL area (MEMW-08, MEMW-09, and MEMW-10). With the possible exception of MW-04, the petroleum related contamination was not indicated beyond the four central monitoring wells (MEMW-06, MEMW-07, MW-02, and MW-03).

Petroleum-related contamination was detected as far south as MW-03. To the southwest, the extent of the contamination associated with jet propellant has not extended as far MW-04; however, fuel oil #6 was tentatively identified in samples from this monitoring well. Upgradient (north) of the pump house, groundwater contamination was not indicated in MW-01; however, PID readings taken at the well headspace suggest that petroleum-related contaminants may be present in the soil in the vicinity of the monitoring well. Contamination was detected in MEMW-07, but the limit of migration to the east was not defined past this well.

The greatest concentrations of contaminants associated with the petroleum contamination were reported for the monitoring wells directly to the southeast and downgradient of the pump house, MEMW-06, MEMW-07, and farther southeast at MW-02.

As noted above, fuel oil #6 was tentatively identified at MW-04 at an estimated concentration of 100 μg/L. It was also tentatively identified at MW-03 at a lower estimated concentration (70 μg/L), and at MEMW-06 at a higher estimated concentration (200 μg/L).

BTEX. BTEX was detected in the monitoring wells immediately southeast of the pump house in MEMW-06 and MEMW-07. Concentrations for BTEX were 1000 μg/L for MEMW-06 and 880 μg/L for MEMW-07. In addition, approximately 300 μg/L of tentatively identified volatile aromatics, also indicative of petroleum contamination, were detected in MEMW-06.

Farther to the south, BTEX was detected in MW-02 and MW-03 at 1700 μg/L and 260 μg/L, respectively. In addition, a concentration of approximately 2000 μg/L was reported for tentatively identified volatile aromatics in the sample from MW-02. The BTEX concentration detected in the sample from MW-02 was the highest concentration reported for the site.

BTEX was not detected in the monitoring wells south of the southern fence of the POL area, (MEMW-08, MEMW-09, and MEMW-10), nor was it detected in MW-04 to the southwest, nor MW-01 to the north.

Jet Propellant. Jet propellant was detected in the same monitoring wells as BTEX with the exception of MW-03, which had an elevated detection limit. Jet propellant was not detected in any monitoring well which did not have BTEX contamination. Jet propellant concentrations were highest in MEMW-07 and MW-02 at 3020 μg/L and 3130 μg/L, respectively. Jet propellant concentrations at MEMW-06 were approximately half that amount (1550 μg/L).

Fuel Oil #6. It should be noted that fuel oil #6 was only tentatively identified and the concentrations are estimated. Fuel oil #6 was tentatively identified at MW-03, MW-04, and MEMW-06. At MW-04, where no BTEX or jet propellant was reported, the concentration

was estimated at 100 μg/L. The estimated concentration was lower at MW-03 (30 μg/L), and higher at MEMW-06 (200 μg/L).

3.8.2 POL Area: PCB Contamination

PCB contamination was only detected in MEMW-06. The PCB mixture Aroclor-1260 was detected in the groundwater from this monitoring well, which is the closest monitoring well to the southeast side of the pump house. PCBs were not detected in any other monitoring well.

3.9 PESTICIDE STORAGE AREA - IDENTIFICATION OF TRENDS

This section compares the analytical results of this confirmatory study investigation of the Pesticide Storage Area with past findings, specifically the analytical results from the 1990 SI and the 1986 sampling event. In both the SI and this study, the pesticides detected most frequently and with the highest concentrations were DDT and its metabolites.

3.9.1 Groundwater

Sampling for the 1990 SI consisted of the collection of composite soil samples from each of three soil borings, and the collection of groundwater from the three monitoring wells which were installed in those soil borings. The comparison of groundwater data involves samples collected from six different wells. One well, PEST-2, was sampled during both the SI and this study. Two other wells, PEST-1 and PEST-3, were sampled during the SI but were replaced by PEST-1R and PEST-3R for this sampling event. While the replacement well for PEST-3 was placed fairly close to the original (less than ten feet), the replacement for PEST-1 was located farther to the southeast of the original. The last well, PEST-4, is the newly installed upgradient well. None of the wells sampled during the SI were in this vicinity.

The only groundwater monitoring well to show pesticide contamination in the SI was PEST-3. Concentrations of 4,4'-DDT, 4,4'-DDD, and 4,4-DDE were detected at concentrations of 6.2 μg/L (estimated), 4.9 μg/L (estimated), and 0.35 μg/L (estimated), respectively. The presence of contamination on this 1990 sample, but not in the other two, was not explained. In comparison, none of the groundwater samples collected during the confirmatory study, including those collected from the PEST-3 replacement well, indicated pesticide contamination. The detection limits for these compounds in the confirmatory study analyses were well below the concentrations detected in the SI (approximately 0.10 μg/L).

Pesticides in general, and DDT and its degradation products in particular, tend to adsorb to particulates in groundwater. As the groundwater samples collected during the SI were unfiltered, and the groundwater collected from the Pesticide Storage Area is silty, it is possible that the contaminant concentrations detected in the groundwater from the SI area attributable to pesticides adsorbing to suspended solids in the groundwater sample. However, unfiltered groundwater samples collected during the confirmatory study did not indicate any contamination.

3.9.2 Soil

The samples collected for the SI were composites of soil taken from the surface to depths of approximately 16 feet below the surface. However, the soil samples collected during the confirmatory study were taken from two foot intervals, and did not exceed a depth of four feet below the surface. Furthermore, the shallow soil samples collected in the confirmatory study indicate that the contaminant concentrations depend on depth. The soil data collected during the SI and that collected during the confirmatory study are, therefore, not comparable.

Positive results detected in the SI samples included 4,4'-DDT, 4,4'-DDD, 4,4'-DDE, and dieldrin. DDT and DDE were detected in all three samples at concentrations up to 27 μg/Kg and 17 μg/Kg, respectively. DDD was detected in two samples at a maximum concentration of 17 μg/Kg. Dieldrin was detected in one sample at 13 μg/Kg. All of the results were

estimated. In comparison, the maximum results from the confirmatory study for these compounds were higher, reaching concentrations of 4,000 μg/Kg for DDT (SB-01), 830 μg/Kg for DDD (SB-07), 445 μg/Kg for DDE (SB-01), and 140 μg/Kg for dieldrin (SB-05).

Contaminants reported for the 1986 soil samples were similar to those detected in the SI and confirmatory study. Shallow soil samples were collected at three depths from a soil boring located 20 feet downslope of the tank in the 1986 sampling event. DDT, DDE, and dieldrin were detected in samples collected at a depth of 0.66 feet below the surface. Concentrations of 170 μg/Kg (DDE), 220 μg/Kg (DDT), and 10 μg/Kg (dieldrin) were reported. Samples collected from a depth of 1.5 feet below the surface contained DDE (42 μg/Kg) and DDT (100 μg/Kg). Samples collected at a depth of 3 feet below the surface also contained DDE and DDT, but at lesser concentrations (5 μg/Kg and 6.6 μg/Kg).

The distribution of contamination found in the soil samples suggests that it is likely that there is another source or sources of pesticide contamination, at or above the surface, which is responsible for the contamination detected in the soil samples collected for the confirmatory study. As M&E has been unable to find reference to the historical depth of the underground storage tank, hypotheses concerning the source of the contamination are presented for both a shallow and deep tank location.

The contamination was detected predominantly in the samples taken in the top two feet of soil. Concentrations detected in samples taken from the lower sampling depth had much lower concentrations. Were the tank buried deeper (10-15 feet below the surface), it is not likely that the contamination indicated is the result of the leaking UST. Were the tank located very close to the surface (within a foot) with a leak at or near the top of the tank, there is a possibility that pesticide contaminated rinsewater could flow out in periods when the water table was elevated into the surrounding soil and adsorb to the soil at the shallow depths sampled.

However, the DDT concentration detected in the 0-2' soil sample located on the other side of the entomology building from the UST (SB-04) was greater than those reported for some of the samples closer to the former location of the tank (SB-06, SB-05). Were tank contents welling to the surface, lower concentrations would be anticipated at increasing distances from the tank. Surface elevations have changed since 1990; pavement in the area was torn up, the entomology shop was removed, the casing was sheared from one pre-existing well, and a second well was buried under soil and debris. Consequently, information as to the historical elevations of each of the soil borings in relation to the tank are not available.

Given the widespread use of DDT and dieldrin as pesticides, and the nature of the activities conducted at the entomology shop, it is likely that routine historical pesticides application to the surface and groundcover is the source of contamination. It is also possible that activities conducted at the former entomology shop contributed to contamination at the surface level. Although the UST can not be ruled out as a source of contamination, it is not the most likely source for the soil contamination reported in this confirmatory study.

3.10 POL AREA - IDENTIFICATION OF TRENDS/COMPARISON TO SI RESULTS

This section compares both jet propellant and PCB contamination found during the confirmatory study with those results reported for samples collected during the 1990 site investigation.

3.10.1 POL Area: Jet Propellant Contamination

A comparison of the contaminant concentrations detected in groundwater samples collected in December 1990 (M&E, 1992) and those reported for the confirmatory study indicate that contaminant concentrations have changed somewhat over time. Figure 3-3 provides a visual comparison of the BTEX and jet propellant concentrations from the two sampling events. Each monitoring well in Figure 3-3 is labelled with the concentrations detected in the 1994 confirmatory study followed by the concentrations from the 1990 SI. Note that the number

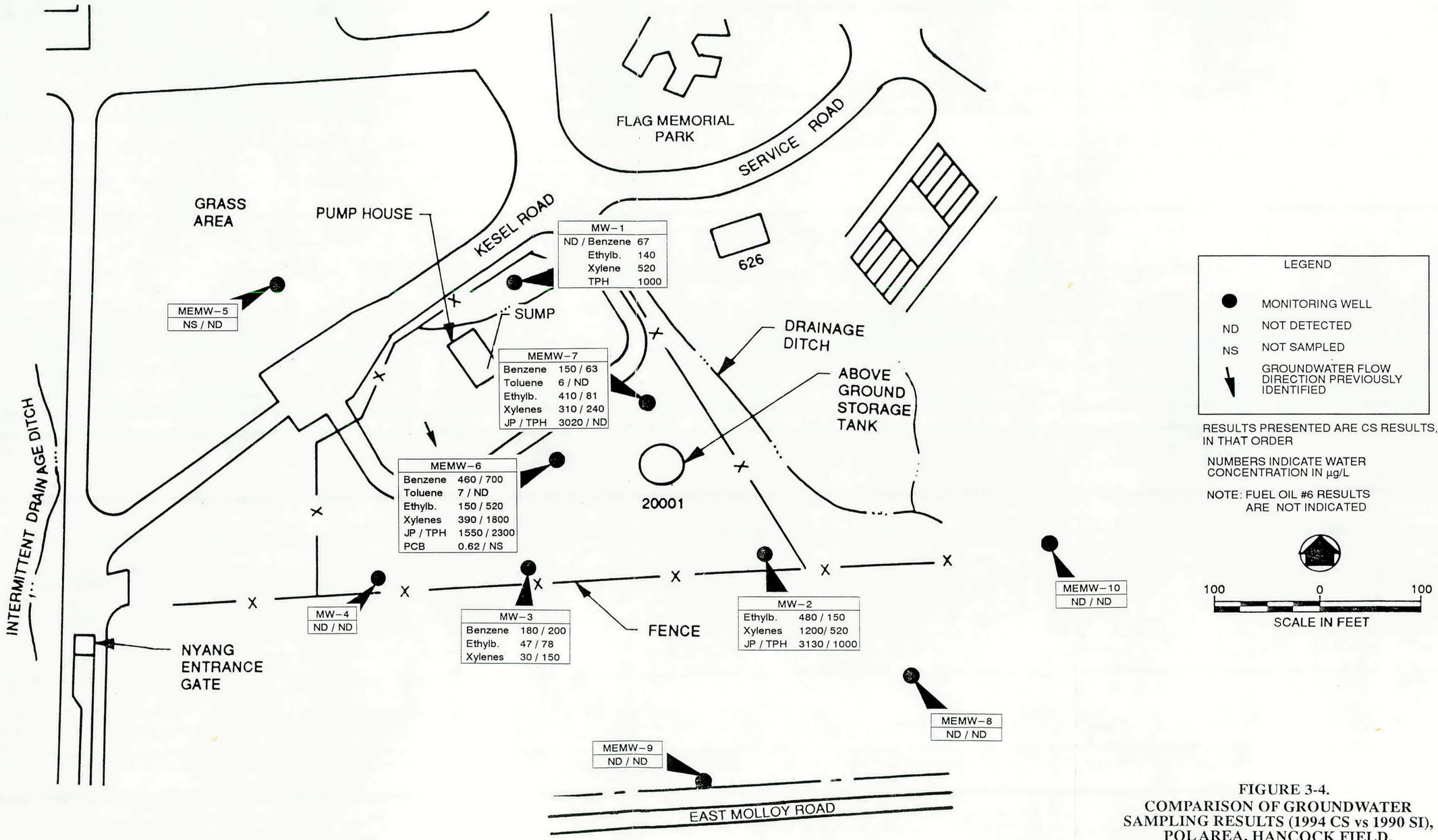


FIGURE 3-4.
COMPARISON OF GROUNDWATER SAMPLING RESULTS (1994 CS vs 1990 SI), POL AREA, HANCOCK FIELD, NEW YORK AIR NATIONAL GUARD, SYRACUSE, NEW YORK

to the left of the backslash is from the confirmatory study, the number to the right is from the SI (CS/SI). Figure 1-5, which displays the site groundwater contour map, for additional information useful to this discussion.

As discussed in the data evaluation section, results from the analytical method performed for the confirmatory study to analyze for jet propellant contamination is a more specific method than the TPH method which was performed for the SI. In addition, the detection limit for the SI TPH method was higher (1000 μg/L), than the detection limit for the DRO method (100 μg/L). Consequently, the results are not directly comparable.

Contamination was detected in the same monitoring wells as in the SI (MEMW-06, MEMW-07, MW-03, and MW-02) with the exception of MW-01. Contamination was still not detected as far downgradient as monitoring wells MEMW-08, MEMW-09, MEMW-10. Contamination related to jet propellant was still not identified in MW-04, however Fuel Oil #6 was tentatively identified in the most recent sampling event.

As noted above, no contamination was reported for MW-01, however the BTEX result for monitoring well MW-01 was 700 μg/L in 1990, and the TPH concentration was 1,000 μg/L.

Contaminant concentrations increased in MEMW-07 and MW-02. BTEX contamination increased by more than a factor of two at both wells (MEMW-07: 384 μg/L to 840 μg/L, MW-02: 670 μg/L to 1680 μg/L). The concentration of jet propellant reported was three times higher than the TPH results of 1990 for both monitoring wells. TPH was not detected at MEMW-07 in 1990, however the detection limit was 1000 μg/L. In comparison, the jet propellant concentration was 3020 μg/L. For MW-02, results went from 1000 μg/l to 3130 μg/L.

Contaminant concentrations decreased in MEMW-06 and MW-03. BTEX concentrations decreased in MEMW-06 by a factor of three. Jet propellant concentration was less than the

TPH concentration reported in the SI (2300 μg/L vs 1550 μg/L). For MW-03, BTEX concentrations decreased by less than a factor of two from 428 μg/L to 257 μg/L.

3.10.2 POL Area: PCB Contamination

One positive detection was reported for PCBs: Aroclor-1260 was reported as estimated for MEMW-06 at 0.62 μg/L. MEMW-06 is the monitoring well closest to and directly downgradient from the front of pump house, where the PCB spill occurred, and is therefore the well most likely to indicate PCB contamination. Groundwater monitoring samples collected during the SI were not analyzed for PCBs. However, purge water from the development of MEMW-06 was analyzed for PCBs, and 1.6 μg/L of Aroclor-1260 was reported from this analysis (M&E, 1992).

4.0 CONCLUSIONS AND RECOMMENDATIONS

The data presented in the previous sections is presented below, along with an identification of future work recommended for the site.

4.1 PESTICIDE STORAGE AREA - CONCLUSIONS

Pesticide contamination of the groundwater was not indicated by the sampling and analyses performed during this confirmatory study. Neither filtered or unfiltered groundwater samples, analyzed for the full list of EPA CLP pesticides, indicated contamination.

Pesticide contamination is present in the shallow soil at the Pesticide Storage Area. Concentrations of 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE were detected in several of the shallow (0-2' below the surface) soil samples collected at the site. Other pesticides detected include heptachlor epoxide, dieldrin, endosulfan sulfate, methoxychlor, alpha-chlordane, and gamma-chlordane. Concentrations exceeded NYSDEC soil cleanup targets for 4,4'-DDT in one sample (SB-01), and dieldrin in another (SB-07).

As in the 1986 sampling of Site 6, concentrations were greater in samples collected from 0-2 feet below the surface than in the samples collected from 2-4 feet below the surface, suggesting that the contamination reported for the surface soil may be the result of activities conducted at the entomology shop or the result of pesticides application to the ground surface and not necessarily from the UST formerly located at the site.

The objectives of the confirmatory study were to establish the current nature and extent of contamination in the Pesticide Storage Area in support of either a Decision Document or future activities. Although groundwater contamination was not detected, surface soil contamination was identified. Further investigation, focusing on delineating the horizontal and vertical extent of this soil contamination, is recommended in Section 4.3.

4.2 POL AREA - CONCLUSIONS

It is evident from the data summary and the associated figures that the extent of jet propellant contamination has changed somewhat since the SI samples were collected in late 1990. With the exception of MW-01, the concentrations from samples collected from each monitoring well did not change by more than a factor of 2 or 3. As MW-01 is slightly upgradient of the front half of the pump house and the pump house door, it is possible that the contaminant plume has moved downgradient of this monitoring well.

Monitoring wells directly south of the pump house, MEMW-06 and MW-03, showed slightly less contamination than in 1990. Consistent with the 1990 data, samples from MW-04, farther to the west, had no jet petroleum contamination detected. Given the east-southeast direction of groundwater flow and low flow velocities, it is likely that contamination has diminished over time as less contaminated groundwater flows in from areas west of the pump house.

Monitoring wells farther to the east and closer to Ley Creek, MEMW-07 and MW-02, showed increased contaminant levels. This would suggest that the plume has migrated toward the wells immediately downgradient of the front of the pump house (MEMW-07), and in the area further downgradient (MW-02).

The fact that the outermost monitoring wells, MEMW-08, MEMW-09, and MEMW-10, still showed no contamination indicates that the jet propellant plume has most likely not migrated to this extent, beyond the boundaries of the Base property.

With respect to PCB contamination, the detection of Aroclor-1260 in MEMW-06 is consistent with PCB contamination reported in soil samples collected from shallow soil borings in the vicinity of the front of the pump house during the SI. In addition, analyses of sampling and drilling wastes from the installation of MEMW-06 indicated high concentrations (2,700 μg/Kg) of Aroclor-1260 in the drummed soil cuttings, and 1.6 μg/L

PCB in the purge and development water from the well (M&E, 1992). It should be noted, however, that the integrity of this well is in question due to damage to the well casing and well cap.

4.3 PESTICIDE STORAGE AREA - RECOMMENDATIONS

NYSDEC cleanup levels were exceeded in the results detected in soil samples collected from surface soil during this confirmatory study. As there is insufficient information to determine the areal extent of the surface soil pesticide contamination which exceeds these and other applicable pesticide target levels, it is recommended that further investigation be conducted to meet fill this data gap.

The use of a screening analysis with a rapid turn-around time coupled with laboratory confirmation is recommended as a cost-effective approach to define the areal extent of contamination and direct further action, possibly remediation or risk assessment, at Site 6. A grid of sampling locations could be established to cover an area of approximately 100 ft. by 100 ft. to include the area of surface soil contamination shown by soil borings SB-01, 02, 05, 06 and 07. Using a hand auger, approximately 16 soil samples would be collected from a depth of 0-2 feet at sampling locations placed 25 ft. apart. Samples would also be collected from 2 background locations outside of the grid in order to clearly establish background pesticide concentrations. Samples would be screened for pesticides in the grid, and from multiple background locations outside of the grid either by a laboratory using a screening method, with a 24-hr. turnaround time, or with Immunoassay test kits in the field. A percentage of the samples would then be submitted for confirmatory analysis by a qualified laboratory.

It is also recommended that monitoring well PEST-1, which was found destroyed, be abandoned according to NYSDEC well-abandonment procedures.

4.4 POL AREA - RECOMMENDATIONS

This section consists of recommendations, to facilitate further investigation of the POL area, specifically the Remedial Investigation (RI) currently scheduled to be conducted at the POL Area in the Spring of 1995. Specific activities proposed for the RI are included. The recommendations and proposed field activities are based upon several discussions with representatives of HAZWRAP, NYSDEC, and NYANG; as well as the information provided by the CS and previous investigations. Further detail is provided in the RI Sampling and Analysis Plan (M&E, 1995).

4.4.1 Soil Contamination

4.4.1.1 PCB Contamination. As soil sampling was not conducted as part of this confirmatory study, the information provided by this study with respect to PCB contamination at the POL area is limited. It is possible that the contamination is still present to as great an extent as it was in 1990. Delineating the vertical and horizontal limits of the PCB contamination to the south and east of the pump house, in order to develop appropriate remedial actions, should be one of the goals of the RI.

In order to meet this goal, during the RI the following activities are proposed:

- Installation and sampling of eight soil borings in the area of suspected PCB contamination
- Collection and analysis of four sediment samples for PCB contamination

4.4.1.2 Petroleum Contamination. The nature and extent of jet petroleum contamination in soil must be assessed in order to direct remediation. To accomplish this, the following activities are proposed:

- a soil gas sampling of forty points to direct the placement of soil borings and monitoring wells
- installation and sampling of ten soil borings to characterize jet propellant contamination
- installation and sampling of two background soil borings

4.4.2 Ground Water Contamination

Likewise, the nature and extent of petroleum contamination in the groundwater must be determined. In order to accomplish this, the following field activities are recommended:

- Geoprobe® groundwater survey of 20 to 25 locations
- installation and development of three shallow and one deep monitoring well
- collection of two rounds of groundwater samples from new and existing wells
- collection of two surface water and four sediment samples for analysis for petroleum contamination

4.4.2.1 Replacement/Repair of Monitoring Wells. The background monitoring well, MEMW-5, should be abandoned and replaced by another background monitoring well during the remedial investigation. In addition, an attempt should be made to replace the steel casing on MEMW-6. Alternatively, an extension should be added to MEMW-6 to convert it to an aboveground well, and an appropriate casing should be installed. Any wells abandoned will be handled in full compliance with NYSDEC well abandonment procedures.

4.4.2.2 Placement of Additional Monitoring Wells. As the monitoring wells farthest downgradient are not showing contamination at this time, the installation of additional monitoring wells during the RI need not extend the area of study any farther in that direction. Effort should be made to more clearly define the extent of the contamination to the east, to the southeast, and to the south of the site. At least three shallow monitoring

wells should be installed to this end. Monitoring wells should be placed to the south, midway between the line of contaminated monitoring wells (MW-3 and MW-2) and those not yet showing contamination (MEMW-8 and MEMW-9). At least one monitoring well should be placed east of the POL area midway between MEMW-7 and MEMW-10.

4.4.2.3 Flush-Mounted Wells. Locating flush-mounted monitoring wells that are installed in woods and other heavily vegetated areas is time-consuming, and there is no apparent need to be able to drive over them. Flush-mounted monitoring wells that are located in the lawn areas are frequently damaged by lawnmowers and, if close enough to the pavement, by trucks or snow plows. As it is necessary to maintain the integrity of these wells to obtain reliable data, and because replacement of monitoring wells is expensive, time consuming, and inefficient, every effort must be made to protect these investments. Whenever possible, monitoring wells installed in or around the POL area in the future should not be flush-mounted. In addition, those monitoring wells already installed should either be marked and protected by a concrete post, or finished with aboveground completions.

5.0 REFERENCES

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APPENDICES

APPENDIX A. POL AREA - FIELD CHANGE ORDERS/VARIANCES

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 1
Page 1 of 8

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Table 4-3 identifies "Sampling Parameters, Containers, Preservation, and Holding Times".

Reason for Change:

The cell associated with the row "Total Petroleum Hydrocarbons" and column "Container" states "two 40-mL glass vial with Teflon-lined lid" when in fact it should state "two 1-liter amber glass bottle with Teflon-lined lid". The laboratory changed their request subsequent to the printing of the work plan.

Recommended Disposition:

Collect TPH samples in the 1-liter amber glass containers.

Impact on Present and Completed Work:

None.

Final Disposition:

TPH samples were collected in the 1-liter amber glass containers.

Request by:
Field/Project Manager: Sandra J. McCarron

Approvals:
HAZWRAP Project Manager:

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 2
Page 2 of 8

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Table 4-3 identifies "Sampling Parameters, Containers, Preservation, and Holding Times".

Reason for Change:

The cell associated with the row "Volatile Organic Compounds" and column "Preservative" states "Ice to 4°". It should also state "4 drops HCl (pH<2)". The table had been incorrectly printed.

Recommended Disposition:

Preserve VOC samples with 4 drops HCl.

Impact on Present and Completed Work:

None.

Final Disposition:

Samples to be analyzed for VOCs were preserved with 4 drops HCl.

Request by:
Field/Project Manager: Sandra J McCarron

Approvals:
HAZWRAP Project Manager: _____

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 3
Page 3 of 8

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Table 4-3 identifies "Sampling Parameters, Containers, Preservation, and Holding Times".

Reason for Change:

The cell associated with the row "Total Petroleum Hydrocarbons" and column "Holding Time" states "28 days" when in fact it should state "7 days". The table had been incorrectly printed.

Recommended Disposition:

Call the lab and verify with them that the correct holding time is 7 days.

Impact on Present and Completed Work:

None.

Final Disposition:

TPH holding times to be no more than 7 days. This has been verified with the laboratory.

Request by:
Field/Project Manager: Sandra J. McCarron

Approvals:
HAZWRAP Project Manager:

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 4
Page 4 of 8

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Table 4-3 identifies "Sampling Parameters, Containers, Preservation, and Holding Times".

Reason for Change:

The table specified that there be three 1-liter containers each for PCBs and Aqueous Organochlorine Pesticides. Some of the wells recharged very slowly and the volume requested by the laboratory was taking a long time to collect.

Recommended Disposition:

Call the laboratory and ascertain whether two 1-liter containers each for PCBs and Aqueous Organochlorine Pesticides would be sufficient.

Impact on Present and Completed Work:

This change reduced delays caused by the slow-recharge wells. No other impacts are foreseen.

Final Disposition:

Two 1-liter containers each for PCBs and Aqueous Organochlorine Pesticides were collected and, according to the laboratory, would be sufficient to conduct the analyses.

Request by:
Field/Project Manager: Sandra J. McCarron

Approvals:
HAZWRAP Project Manager:

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 5
Page 5 of 8

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Field activities at the Pesticide Storage Area (Site 1) included drilling and sampling seven shallow boreholes, sampling three existing groundwater monitoring wells, and installing and sampling one background monitoring well. (Section 2.5.3.2)

Reason for Change:

Soil sampling and installation of the monitoring well was eliminated from the scope of the present field effort prior to mobilization for this field effort. Logistical problems, severe weather, and difficulties in locating the three groundwater monitoring wells in the pesticide storage area as well as two monitoring wells in the POL area caused significant delays in the field schedule. Several concerns were raised: 1) it was unlikely that all wells at both the pesticide and POL areas could be sampled before the holiday (4th of July); 2) it was questionable whether the laboratory would be able to analyze samples for TPH within the 7-day holding time given the extended holiday weekend; 3) one of the three wells could not be located even with a magnetometer; and 4) one of the two wells located is of questionable integrity.

Recommended Disposition:

Postpone sampling the two pesticide storage area wells until installation and sampling of the background monitoring well, to ensure that all sampling at the POL area can be completed. Conduct field reconnaisance to better map the site.

Impact on Present and Completed Work:

A second trip, and mobilization, had already been planned for this site, including installation and sampling of a background monitoring well. There should be no significant impacts on the goals of the field effort for this site. Cost and schedule impacts were already forecasted when soil sampling and the background well was separated from other groundwater sampling.

Final Disposition:

No sampling was performed at the Pesticide Storage Area. A field reconnaisance was conducted and the site was more completely mapped.

Request by:
Field/Project Manager: Sandra G. McCarron

Approvals:
HAZWRAP Project Manager: _____

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 6
Page 6 of 8

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Field activities at the POL Area (Site 2) included sampling ten existing groundwater monitoring wells. (Section 2.5.3.3)

Reason for Change:

The integrity of background monitoring well (No. MEMW-5) was compromised: Upon removal of the metal cover, it was discovered that the metal casing and cover were not attached to the PVC well, but were resting alone on the soil. The actual well was located two feet away, under animal excrement. (It is presumed that, because this well was flush-mounted in a lawn, the casing was knocked off by a lawnmower.) The plastic cover to the PVC well was cracked with a piece missing. Bentonite from around the well had oozed up and filled approximately 4" to 6" of the upper portion of the well.

Recommended Disposition:

Do not sample background well MEMW-5. Install a new background well for the POL area and sample the new well during the next sampling event at the POL area.

Impact on Present and Completed Work:

Accurate background data is critical to the development of preliminary remediation goals and detailed evaluation of remedial alternatives. It is important to obtain reliable results. Since the POL area is slated for additional field studies, installation of another background well can be accomplished without a major impact to the overall budget.

Final Disposition:

The background monitoring well for POL area, well number MEMW-5, was not sampled.

Request by:
Field/Project Manager: Sandra J. McCarron

Approvals:
HAZWRAP Project Manager:

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 7
Page 7 of 8

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Temperature, pH, and conductivity should be measured and recorded at predetermined intervals while purging the monitoring well.

Reason for Change:

Both the pH/temperature/conductivity meter and backup meter were malfunctioning due to exposure to heavy rain and humidity, impacting these measurements at MEMW-8 and MEMW-9.

Recommended Disposition:

Purge a minimum of the recommended three well volumes and measure as possible.

Impact on Present and Completed Work:

No significant impact.

Final Disposition:

Measurements taken at MEMW-8: initial conductivity and pH was obtained with the meter; both readings were comparable to results for past field effort. Measurements taken at MEMW-9: Due to its slow recharge, the well had to be left overnight. The meter was operating at that time and was used. Final readings were also obtained and were comparable.

Request by:
Field/Project Manager: Sandra P. McCarron

Approvals:
HAZWRAP Project Manager: _____

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 8
Page 8 of 8

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Field activities at the Pesticide Storage Area (Site 1) included drilling and sampling seven shallow boreholes, sampling three existing groundwater monitoring wells, and installing and sampling one background monitoring well. (Section 2.5.3.2)

Reason for Change:

Soil sampling and installation of the monitoring well was eliminated from the scope of the present field effort prior to mobilization for this field effort. Logistical problems, severe weather, and difficulties in locating the three groundwater monitoring wells in the pesticide storage area caused significant delays in the field schedule. Part of the logistical/well location problems were due to the fact that the physical layout of the site had changed since the last field effort, including removal of a building and pavement. One groundwater monitoring well was could not be located, despite numerous, extensive searches with both tape measures and a magnetometer. The area where the well had been was previously paved and, in the past few years, the pavement had been torn up. It is highly unlikely that an intact well will be located.

Recommended Disposition:

Discontinue searching for the well. Recommend that another well be installed in place of the one that has apparently been destroyed.

Impact on Present and Completed Work:

A second trip, and mobilization, had already been planned for this site, including installation and sampling of a background monitoring well. Cost and schedule impacts will occur if the third well is to be replaced. This well had been installed in approximately the same location as the previously removed pesticide storage tank.

Final Disposition:

No sampling was performed at the Pesticide Storage Area. A field reconnaisance was conducted and the site was more completely mapped. The search for the third well was discontinued.

Request by:
Field/Project Manager: Sandra J. McCarron

Approvals:
HAZWRAP Project Manager: _____

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

APPENDIX B. POL AREA - MONITORING WELL WORKSHEETS

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MW-1 Date Sampled 06/30/94 Time: Start 0745 End 0955

Well Diameter 2 inches + 12 = --- (d) ft. Well secured upon arrival? Y/(N*)

Depth of well from T.O.C. 16.56 ft. Depth of well from T.O. PVC 16.44 ft.

Depth of water from T.O.C. 7.84 ft. Depth of water from T.O. PVC 7.72 ft.

Feet of standing water 8.72 (h) ft. Standing water (ft.) = 8.72

Standing Water Volume = $\pi[(d)^2+4](h)$ taken from well volume table
= 3.14[(____ft)^2+4](____ft) x 7.48 gal/ft^3 = 1.5 gals

PID Readings (ppm)
Breathing 0
Well 386

Purging Method Teflon Bailer Purge: Time: Start 0900 End 0928

		pH	Conductivity	Temp. (F)	Time
1 well volume =	1.5 gal.	6.77	541	63.5	0905
2 well volume =	3.0 gal.	6.93	519	59.6	0915
3 well volume =	4.5 gal.	6.99	521	61.7	0928**
	Final =	6.98	525 (11.50 to T.O.C.)	61	0948

Final Water Level = 11.42 (from T.O. PVC)

Sample Collection: Time Start 0936 End 0948

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	none	sulfide	fishy	musty	petroleum	
Describe color:	colorless	black	brown	orange	red	
Describe appearance:	turbid	silty	sand	clay	floaters	
	(clear) sheen	multiphased	foaming	slimy	algae	small amounts of black flock

Organic Layer? no Length? ____ Samples preserved Yes

Comments * no bolts in cover; no locks on well cap

** recharge slowed

good recharge – best for large volume samples

Refer to the corresponding field log book – page(s) 42-43.

revised 1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MW-2 Date Sampled 06/30/94 Time: Start 1022 End 1120

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? (Y)N

Depth of well from T.O.C. 13.52 ft. Depth of well from T.O. PVC 13.44 ft.

Depth of water from T.O.C. 10.96 ft. Depth of water from T.O. PVC 10.88 ft.

Feet of standing water 2.56 (h) ft. Standing water (ft.) = 2.56

Standing Water Volume	taken from well volume table $= \pi[(d)^2+4](h)$ $= 3.14[(\_\_\_\_ft)^2+4](\_\_\_\_ft) \times 7.48\ gal/ft^3 = 0.5$ gals

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Teflon Bailer Purge: Time: Start 1044 End 1105

		pH	Conductivity	Temp. (F)	Time
1 well volume =	0.5 gal.	7.13	351	58.4	1052
2 well volume =	1 gal.	7.04	350	57.8	1054
3 well volume =	1.5 gal.	7.02	349	57.3	1057
	Final =	7.01	349	57.2	1110

Final Water Level = 10.88 ft. (from T.O. PVC) (10.96 ft TOC)

Sample Collection: Time Start 1105 End 1110

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum	
Describe color:	(colorless)	black	brown	orange	red	
Describe appearance:	turbid	silty	sand	clay	floaters	
	(clear)	multiphased	foaming	slimy	algae	larvae*
	sheen					

Organic Layer? no Length? -- Samples preserved Yes

Comments * first bailer had hundreds of white 1/8" larvae

PVC loose and rotates freely, but is still attached

Refer to the corresponding field log book – page(s) 38, 45.

revised 1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MW-3 Date Sampled 06/29/94 Time: Start 1208 End 1935

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? (Y) N

Depth of well from T.O.C. 13.56 ft. Depth of well from T.O. PVC 13.44 ft.

Depth of water from T.O.C. 11.06 ft. Depth of water from T.O. PVC 10.94 ft.

Feet of standing water 2.5 (h) ft. Standing water (ft.) = 2.5

Standing Water Volume = taken from well volume table
$= \pi[(d)^2+4](h)$
$= 3.14[(\_\_\_\_ ft)^2+4](\_\_\_\_ ft) \times 7.48 \text{ gal/ft}^3 = 0.5$ gals

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Teflon Bailer Purge: Time: Start 1720 End 1805

		pH	Conductivity	Temp. (F)	Time
1 well volume =	0.5 gal.	6.60	597	61.0	1725
2 well volume =	1.0 gal.	8.32	631	60.0	1744
3 well volume =	1.5 gal.	8.62	647	59.4	1805
	Final =	Not ms'd	Meter went down		

Final Water Level = 12.14 ft. (from T.O. PVC) (12.51 ft.TOC)

Sample Collection: Time Start 1818 End 1930

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	none	sulfide	fishy	musty	(petroleum)
Describe color:	colorless	(black) (ppt formed after 30. S. in first bailer)	brown	orange	red
Describe appearance:	turbid	silty	sand	clay	floaters
	clear	multiphased	foaming	slimy	algae
	sheen				

Organic Layer? sheen Length? sheen Samples preserved Yes

Comments

Refer to the corresponding field log book – page(s) 34, 36 – 37.

revised
1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MW-4 Date Sampled 06/29/94 Time: Start 830 End 1400

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? (Y)/N

Depth of well from T.O.C. 18.46 ft. Depth of well from T.O. PVC 18.34 ft.

Depth of water from T.O.C. 11.20 ft. Depth of water from T.O. PVC 11.08 ft.

Feet of standing water 7.26 (h) ft. Standing water (ft.) = 7.26

Standing Water Volume	taken from well volume table $= \pi[(d)^2+4](h)$ $= 3.14[(\_\_\_\_ ft)^2+4](\_\_\_\_ ft) \times 7.48 \text{ gal/ft}^3 = 1.3$ gals

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Teflon Bailer Purge: Time: Start 1000 End 1220

		pH	Conductivity	Temp. (F)	Time
1 well volume =	1.3 gal.	7.38	460	69.7	1032
2 well volume =	2.6 gal.	7.91	458	65.4	1106
3 well volume =	3.9 gal.	7.96	459	64.8	1157
	Final =	8.03	471	62.1	1330

Final Water Level = -- (from T.O. PVC) (13.45 ft. TOC)

Sample Collection: Time Start 1225 End 1325

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum	
Describe color:	colorless	black	brown	(orange)	red	
Describe appearance:	turbid	silty	sand	clay	floaters	
	(clear)	multiphased	foaming	slimy	algae	clear w/orange silt
	sheen	possible slight sheen in bucket? (water is dark)				

Organic Layer? No Length? -- Samples preserved Yes

Comments

Refer to the corresponding field log book – page(s) 29, 32.

revised 1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MEMW-5 Date Sampled 06/30/94 Time: Start 1318 End _____

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? Y (N)*

Depth of well from T.O.C. _____ ft. Depth of well from T.O. PVC _____

Depth of water from T.O.C. _____ ft. Depth of water from T.O. PVC _____

Feet of standing water _____ (h) ft. Standing water (ft.) = _____

Standing Water Volume	taken from well volume table $= \pi[(d)^2+4](h)$ $= 3.14[(\_\_\_\_ ft)^2+4](\_\_\_\_ ft) \times 7.48 \text{ gal/ft}^3 =$ gals

PID Readings (ppm)

Breathing _____

Well _____

Purging Method _____ Purge: Time: Start _____ End _____

		pH	Conductivity	Temp. (F)	Time
1 well volume =	_____ gal.				
2 well volume =	_____ gal.				
3 well volume =	_____ gal.				
	Final =				

Final Water Level = _____ (from T.O. PVC)

Sample Collection: Time Start _____ End _____

Sampling Method _____ Bailer Type _____

Sample Characteristics (Circle all applicable)

Describe odor:	none	sulfide	fishy	musty	petroleum _____
Describe color:	colorless	black	brown	orange	red _____
Describe appearance:	turbid	silty	sand	clay	floaters
	clear	multiphased	foaming	slimy	algae _____
	sheen				

Organic Layer? _____ Length? _____ Samples preserved? _____

Comments *cover displaced approximately 2 ft. away from well; well covered with excrement – see notes in field book

WELL NOT SAMPLED

Refer to the corresponding field log book – page(s) 48 – 49.

revised 1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MEMW-6 Date Sampled 06/29/94 Time: Start 725 End 1800

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? Y (N)*

Depth of well from T.O.C. ---* ft. Depth of well from T.O. PVC 14.62 ft.

Depth of water from T.O.C. ---* ft. Depth of water from T.O. PVC 12.52 ft.

Feet of standing water ---* (h) ft. Standing water (ft.) = 2.10

Standing Water Volume	taken from well volume table $= \pi[(d)^2+4](h)$ $= 3.14[(\_\_\_\_ft)^2+4](\_\_\_\_ft) \times 7.48\ gal/ft^3 = 0.4$ gals

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Teflon Bailer Purge: Time: Start 800 End 1750

		pH	Conductivity	Temp. (F)	Time
1 well volume =	0.4 gal.	7.27	1030	63.4	820
2 well volume =	0.8 gal.	7.70	774	63.8	1120
3 well volume =	--- gal.	---	---	---	---**
	Final =	7.80	846	64.0	1748

Final Water Level = Not ms'd** (from T.O. PVC)

Sample Collection: Time Start 1115 End 1800

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	none	(sulfide[1])	fishy	musty	(petroleum[1])	[1] started on 2nd purge volume
Describe color:	colorless	(black[1])	brown	orange	red	
Describe appearance:	turbid	silty	sand	clay	floaters	
	clear	multiphased	foaming	slimy	algae	
	sheen					

Organic Layer? *** Length? -- Samples preserved Yes

Comments * casing gone, well cap disturbed

** very slow recharge, insufficient volume

B. Hedberg recommends continuously sampling well over the day.

***possible slight sheen in bucket? (water is dark)

Refer to the corresponding field log book – page(s) 27 – 28, 30 –31.

revised 1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MEMW-7 Date Sampled 06/28/94 Time: Start 1600 End 1820

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? (Y)N*

Depth of well from T.O.C. --- ft. Depth of well from T.O. PVC 14.52 ft.

Depth of water from T.O.C. --- ft. Depth of water from T.O. PVC 11.82 ft.

Feet of standing water --- (h) ft. Standing water (ft.) = 2.70

Standing Water Volume = $\pi[(d)^2+4](h)$ taken from well volume table
= 3.14[(____ft)^2+4](____ft) x 7.48 gal/ft^3 = 0.5 gals

PID Readings (ppm)
Breathing 0
Well 1.7

Purging Method Teflon Bailer Purge: Time: Start 1630 End 1654

		pH	Conductivity	Temp. (F)	Time
1 well volume =	0.5 gal.	6.97	510	62	
2 well volume =	1.0 gal.	6.79	521	62	
3 well volume =	1.5 gal.	6.79	524	62	
	Final =	6.96	572	61.5	

Final Water Level = 11.86 ft. (from T.O. PVC) (12.08 ft. TOC)

Sample Collection: Time Start 1654 End 1740

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum	
Describe color:	colorless	black	brown	(orange)	red	flock precipitate in purge water
Describe appearance:	turbid	silty	sand	clay	floaters	clear – sometimes silting because of shallowness
	(clear)	multiphased	foaming	slimy	algae	
	sheen					

Organic Layer? No Length? -- Samples preserved Yes

Comments * lock snipped
– due to low quantity of standing water, bailer occasionally hit bottom
recharge okay for continuous sampling

Refer to the corresponding field log book – page(s) 23 – 24.

revised
1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MEMW-8 Date Sampled 06/30/94 Time: Start 1350 End 1530

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? (Y)N

Depth of well from T.O.C. --- ft. Depth of well from T.O. PVC 14.82 ft.

Depth of water from T.O.C. --- ft. Depth of water from T.O. PVC 10.08 ft.

Feet of standing water --- (h) ft. Standing water (ft.) = 4.74

Standing Water Volume	taken from well volume table
	$= \pi[(d)^2+4](h)$
	$= 3.14[(\_\_\_\_ ft)^2+4](\_\_\_\_ ft) \times 7.48 \text{ gal/ft}^3 = 0.8$ gals

PID Readings (ppm)

Breathing 0

Well --

Purging Method Teflon Bailer Purge: Time: Start ____ End ____

		pH	Conductivity	Temp. (F)	Time
1 well volume =	0.8 gal.	5--	579	--	1456
3 well volume =	2.4 gal.	--	--	--	meters
5 well volume =	4.1 gal.	--	--	--	went
	Final =	--	--	--	down

Final Water Level = 10.10 ft. (from T.O. PVC)

Sample Collection: Time Start 1507 End 1514

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum	
Describe color:	(colorless)	black	brown	orange	red	orange silt
Describe appearance:	turbid	silty	sand	clay	floaters	
	(clear)	multiphased	foaming	slimy	algae	
	sheen					

Organic Layer? No Length? -- Samples preserved Yes

Comments PVC rotates freely

Refer to the corresponding field log book – page(s) 50-51.

revised
1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MEMW-9 Date Sampled 06/30/94 Time: Start 1612 End 820 (07/01/94)

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? (Y)N

Depth of well from T.O.C. --- ft. Depth of well from T.O. PVC 13.32 ft.

Depth of water from T.O.C. --- ft. Depth of water from T.O. PVC 8.76 ft.

Feet of standing water --- (h) ft. Standing water (ft.) = 4.56

Standing Water Volume	taken from well volume table $= \pi[(d)^2+4](h)$ $= 3.14[(\_\_\_\_ft)^2+4](\_\_\_\_ft) \times 7.48\ gal/ft^3 = 0.8$ gals

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Teflon Bailer Purge: Time: Start 16.33 End 1855

		pH	Conductivity	Temp. (F)	Time
1 well volume =	0.75 gal.	*6.5	--	--	
2 well volume =	1.5 gal.	--	--	--	meters
3 well volume =	2.2 gal.	--	--	--	went
	Final =	6.92	1230	62.2	down

Final Water Level = Not ms'd/none (from T.O. PVC)

Sample Collection: Time Start 800 (07/01/94) End 820 (07/01/94)

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum	
Describe color:	(colorless)	black	brown	orange	red	
Describe appearance:	(turbid)	(silty)	sand	clay	floaters	brown/black silt fairly loaded
	clear	multiphased	foaming	slimy	algae	
	sheen					

Organic Layer? No Length? -- Samples preserved Yes

Comments *pH w/paper; extremely slow purging

low recovery; returned on 07/01/94 to fill sample bottles

06/30/94 – pH, temp. cond. meter(s) not working; 07/21/94 meter back up

Refer to the corresponding field log book – page(s) 53-54.

revised 1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock SI/CS Job No. 014541-1-2 Samplers C. Lapite/B. Wyskowski

Well ID MEMW-10 Date Sampled 06/30/94 Time: Start 1138 End 1250

Well Diameter 2 inches + 12 = -- (d) ft. Well secured upon arrival? (Y)N*

Depth of well from T.O.C. 16.58 ft. Depth of well from T.O. PVC 16.42 ft.

Depth of water from T.O.C. 8.86 ft. Depth of water from T.O. PVC 8.74 ft.

Feet of standing water 7.72 (h) ft. Standing water (ft.) = 7.72

Standing Water Volume	taken from well volume table $= \pi[(d)^2+4](h)$ $= 3.14[(\_\_\_\_ft)^2+4](\_\_\_\_ft) \times 7.48\ gal/ft^3 = 1.3$ gals

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Teflon Bailer Purge: Time: Start 1210 End 1230

		pH	Conductivity	Temp. (F)	Time
1 well volume =	1.3 gal.	7.79	588	64.5	1217
2 well volume =	2.6 gal.	7.66	558	64.1	1223
3 well volume =	3.9 gal.	7.28	519	58.3	1228
	Final =	7.27	535	60.9	1234

Final Water Level = 8.74 ft. (from T.O. PVC) (8.82 ft TOC)

Sample Collection: Time Start 1230 End 1241

Sampling Method Bailer Bailer Type Teflon – disposable

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum	
Describe color:	colorless	black	brown	(orange)	red	heavy orange silt
Describe appearance:	turbid	(silty)	sand	clay	floaters	
	(clear)	multiphased	foaming	slimy	algae	
	sheen					

Organic Layer? No Length? -- Samples preserved Yes

Comments *protective cover intact; well cover w/lock could be easily lifted out

Refer to the corresponding field log book – page(s) 47.

revised
1/95

APPENDIX C. POL AREA - DATA VALIDATION

VOLATILE ORGANIC ANALYSES

Volatile Organic Analysis (VOA)

A Level C data validation was performed on the volatile organic analytical data obtained from National Environmental Testing, Inc. for nineteen aqueous samples collected from the Hancock Field Site, New York Air National Guard Base, Syracuse, New York. M&E evaluated the data according to DOE/HWP-65/RI, "HAZWRAP Requirements for Quality Control of Analytical Data" (July, 1990), which was written for the 2/88 Organic Statement of Work (SOW) and incorporated validation actions consistent with the 3/90 Organic SOW.

The data were evaluated based on the examination of the following:

- Holding Times
- * GC/MS Tuning
- Calibrations
- Blanks
- * LCSs
- Surrogates
- * Matrix Spike/Matrix Spike Duplicate
- * Internal Standard Area Performance
- * Field Duplicate Recoveries

* All criteria were met for this parameter.

Table I summarizes the validation recommendations that are based on the following information:

Holding Times

Trip blank FLDQC-TB3-06-30-QC-113 was analyzed approximately 3 hours outside of holding time. All non-detected results are qualified as estimated (UJ). The only positive result, methylene chloride, was already qualified as estimated (J) as it was below the CRQL.

Calibrations

The average relative response factor ($\overline{RRF}$) for 1,1,2,2-Tetrachloroethane (0.485) was below criteria (0.500) in the initial calibration performed on instrument "HP5970E" on 06/30/94. The following is a list of samples associated with this initial calibration:

MW-003-06-29-NX-103	MW-004-06-29-NX-104
MW-004-06-29-NX-104MS	MW-004-06-29-NX-104MSD
MEMW-006-06-29-NX-106	MEMW-007-06-28-NX-107
MEMW-007-06-28-FD-125	MEMW-007-06-28-FD-125DL
FLDQC-06-28-TB-111	FLDQC-TB2-06-29-QC-112
FLDQC-FB1-06-29-QC-115	FLDQC-EB1-06-29-QC-114

TABLE 1
Traffic Report Numbers

MW-001-06-30-NX-101

MW-002-06-30-NX-102

MW-003-06-29-NX-103

MW-004-06-29-NX-104

MW-004-06-29-NX-104MS

MW-004-06-29-NX-104MSD

MEMW-006-06-29-NX-105

MEMW-007-06-28-NX-107

MEMW-007-06-28-FD-125

MEMW-008-06-30-NX-108

MEMW-009-07-01-NX-109

MEMW-010-06-30-NX-110

FLDQC-06-28-TB-111

FLDQC-TB2-06-29-QC-112

FLDQC-TB3-06-30-QC-113

FLDQC-TB4-07-01-QC-126

FLDQC-FB1-06-29-QC-115

FLDQC-FB2-06-30-QC-116

FLDQC-EB1-06-29-QC-114

As all of the results for 1,1,2,2-Tetrachloroethane in the associated samples are non-detected, the results for this compound in the associated samples are qualified as rejected (R).

The relative response factor (RRF) for 1,1,2,2-Tetrachloroethane was also below criteria (0.500) in the continuing calibrations performed on instrument "HP5970E" on 07/02/94 (RRF=0.499), 07/05/94 (RRF=0.458), 07/06/94 (RRF=0.466), and 07/07/94 (RRF=0.441). Below are listed the samples associated with these continuing calibrations:

CC 07/02/94
MEMW-007-06-28-FD-125

CC 07/05/94
MW-003-06-29-NX-103
MW-004-06-29-NX-104
MW-004-06-29-NX-104MS
MW-004-06-29-NX-104MSD
FLDQC-EB1-06-29-QC-114

CC 07/06/94
MEMW-006-06-29-NX-106
MEMW-007-06-28-FD-125DL
FLDQC-TB2-06-29-QC-112

CC 07/07/94
FLDQC-FB1-06-29-QC-115

As all of the samples associated with these continuing calibrations are also associated with the initial calibration listed above, the results for 1,1,2,2-Tetrachloroethane are already qualified as rejected (R).

Blanks

The following is a summary of the blank action levels derived from the method, equipment, field, and trip blanks:

Compound	Max. Conc.	Action Level	CRQL
4-Methyl-2-Pentanone	1 µg/L	5 µg/L	10 µg/L
1,1,2,2-Tetrachloroethane	1 µg/L	5 µg/L	10 µg/L
Methylene Chloride	2 µg/L	20 µg/L	10 µg/L
Chloroform*	32 µg/L	160 µg/L	10 µg/L
Bromodichloromethane*	16 µg/L	80 µg/L	10 µg/L
Dibromochloromethane*	8 µg/L	40 µg/L	10 µg/L

It should be noted that the last three blank contaminants were reported in the tap water field blank, and the contamination is attributable to the fact that the tap water is chlorinated. No positive results were reported in any field samples for any of the compounds listed above as blank contaminants. Consequently, no qualifications based upon blank contamination are necessary.

Surrogates

Although none of the field samples or field QC samples had surrogates outside of criteria, it should be noted that the method blank, "VBLK0702994E", analyzed on 07/02/94 on instrument "HP5970E" had a 87% recovery for Toluene-d8, which is just outside of QC limits (88%-110%). As the recovery was not grossly outside of criteria, no action is necessary.

Additional Comments

Sample MEMW-007-06-28-FD-125 was initially analyzed undiluted. As the results for ethylbenzene and total xylenes exceeded the calibration range, the sample was reanalyzed at a 5-times dilution. Results for ethylbenzene and total xylenes are reported from the diluted analysis. Results for the remaining compounds are reported from the undiluted analysis.

Table I: Recommendation Summary
for Volatile Organic Analyses Performed on Groundwater Samples
Hancock Field, NYANG, Syracuse, NY

Sample No.	Action
MW-001-06-30-NX-101	A
MW-002-06-30-NX-102	A
MW-003-06-29-NX-103	R^1,R^2
MW-004-06-29-NX-104	R^1,R^2
MEMW-006-06-29-NX-106	R^1,R^2
MEMW-007-06-28-NX-107	A
MEMW-007-06-28-FD-125	R^1,R^2
MEMW-007-06-28-FD-125DL	R^1,R^2
MEMW-008-06-30-NX-108	A
MEMW-009-07-01-NX-109	A
MEMW-010-06-30-NX-110	A
FLDQC-06-28-TB-111	R^1
FLDQC-TB2-06-29-QC-112	R^1,R^2
FLDQC-TB3-06-30-QC-113	J^1
FLDQC-TB4-07-01-QC-126	A
FLDQC-FB1-06-29-QC-115	R^1,R^2
FLDQC-FB2-06-30-QC-116	A
FLDQC-EB1-06-29-QC-114	R^1,R^2

A - Accept all data.

J^1 - Qualify as estimated (UJ) all non-detected results due to analysis outside of holding time.

R^1 - Reject (R) the non-detected results for 1,1,2,2-Tetrachloroethane due to low average RRF in the initial calibration.

R^2 - Reject (R) the non-detected results for 1,1,2,2-Tetrachloroethane due to low RRFs in the continuing calibration.

Volatile Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		106026	106027	105996	105992	105994
M&E SAMPLE ID:		MW-001-06-30-NX-101	MW-002-06-30-NX-102	MW-003-06-29-NX-103	MW-004-06-29-NX-104	MEMW-006-06-29-NX-106
COMPOUND	CRQL					
Chloromethane	10	10 U	100 U	100 U	10 U	50 U
Bromomethane	10	10 U	100 U	100 U	10 U	50 U
Vinyl Chloride	10	10 U	100 U	100 U	10 U	50 U
Chloroethane	10	10 U	100 U	100 U	10 U	50 U
Methylene Chloride	10	10 U	100 U	100 U	10 U	50 U
Acetone	10	10 U	100 U	100 U	10 U	50 U
Carbon Disulfide	10	10 U	100 U	100 U	10 U	50 U
1,1-Dichloroethene	10	10 U	100 U	100 U	10 U	50 U
1,1-Dichloroethane	10	10 U	100 U	100 U	10 U	50 U
1,2-Dichloroethene(total)	10	10 U	100 U	19 J	10 U	50 U
Chloroform	10	10 U	100 U	100 U	10 U	50 U
1,2-Dichloroethane	10	10 U	100 U	100 U	10 U	50 U
2-Butanone	10	10 U	100 U	100 U	10 U	50 U
1,1,1-Trichloroethane	10	10 U	100 U	100 U	10 U	50 U
Carbon Tetrachloride	10	10 U	100 U	100 U	10 U	50 U
Bromodichloromethane	10	10 U	100 U	100 U	10 U	50 U
1,2-Dichloropropane	10	10 U	100 U	100 U	10 U	50 U
cis-1,3-Dichloropropene	10	10 U	100 U	100 U	10 U	50 U
Trichloroethene	10	10 U	100 U	100 U	10 U	50 U
Dibromochloromethane	10	10 U	100 U	100 U	10 U	50 U
1,1,2-Trichloroethane	10	10 U	100 U	100 U	10 U	50 U
Benzene	10	10 U	100 U	180	10 U	460
trans-1,3-Dichloropropene	10	10 U	100 U	100 U	10 U	50 U
Bromoform	10	10 U	100 U	100 U	10 U	50 U
4-Methyl-2-pentanone	10	10 U	100 U	100 U	10 U	50 U
2-Hexanone	10	10 U	100 U	100 U	10 U	50 U
Tetrachloroethene	10	10 U	100 U	100 U	10 U	50 U
Toluene	10	10 U	100 U	100 U	10 U	7 J
1,1,2,2-Tetrachloroethane	10	10 U	100 U	R	R	R
Chlorobenzene	10	10 U	100 U	100 U	10 U	50 U
Ethylbenzene	10	10 U	480	47 J	10 U	150
Styrene	10	10 U	100 U	100 U	10 U	50 U
Total Xylenes	10	10 U	1200	30 J	10 U	390
DILUTION FACTOR:		1	10	10	1	5
DATE SAMPLED:		06/30/94	06/30/94	06/29/94	06/29/94	06/29/94
DATE ANALYZED:		07/09/94	07/09/94	07/05/94	07/05/94	07/06/94
REMARKS:						

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.
* – Value is reported from the [redacted]d anal[redacted]

Volatile Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		105915	105916	106029	106087	106028
M&E SAMPLE ID:		MEMW-007-06-28-NX-107	MEMW-007-06-28-FD-125	MEMW-008-06-30-NX-108	MEMW-009-07-01-NX-109	MEMW-010-06-30-NX-110
COMPOUND	CRQL					
Chloromethane	10	50 U	10 U	10 U	10 U	10 U
Bromomethane	10	50 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10	50 U	10 U	10 U	10 U	10 U
Chloroethane	10	50 U	10 U	10 U	10 U	10 U
Methylene Chloride	10	50 U	10 U	10 U	10 U	10 U
Acetone	10	50 U	10 U	10 U	10 U	10 U
Carbon Disulfide	10	50 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10	50 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	10	50 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene(total)	10	50 U	10 U	10 U	10 U	10 U
Chloroform	10	50 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10	50 U	10 U	10 U	10 U	10 U
2-Butanone	10	50 U	10	10 U	10 U	10 U
1,1,1-Trichloroethane	10	50 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10	50 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10	50 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10	50 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10	50 U	10 U	10 U	10 U	10 U
Trichloroethene	10	50 U	10 U	10 U	10 U	10 U
Dibromochloromethane	10	50 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10	50 U	10 U	10 U	10 U	10 U
Benzene	10	140	160	10 U	10 U	10 U
trans-1,3-Dichloropropene	10	50 U	10 U	10 U	10 U	10 U
Bromoform	10	50 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10	50 U	10 U	10 U	10 U	10 U
2-Hexanone	10	50 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10	50 U	10 U	10 U	10 U	10 U
Toluene	10	6 J	6 J	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10	R	R	10 U	10 U	10 U
Chlorobenzene	10	50 U	10 U	10 U	10 U	10 U
Ethylbenzene	10	400	420 *	10 U	10 U	10 U
Styrene	10	50 U	10 U	10 U	10 U	10 U
Total Xylenes	10	300	320 *	10 U	10 U	10 U
DILUTION FACTOR:		5	5	1	1	1
DATE SAMPLED:		06/28/94	06/28/94	06/30/94	07/01/94	06/30/94
DATE ANALYZED:		07/01/94	07/06/94	07/09/94	07/07/94	07/09/94
REMARKS:		Field Duplicate of 105916	Field Duplicate of 105915			

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.
* – Value is reported from the diluted analysis.

Volatile Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		105917	105997	106031	106088	105993
M&E SAMPLE ID:		FLDQC-06-28-TB-111	FLDQC-TB2-06-29-QC-112	FLDQC-TB3-06-30-QC-113	FLDQC-TB4-07-01-QC-126	FLDQC-FB1-06-29-QC-115
COMPOUND	CRQL					
Chloromethane	10	10 U	10 U	10 UJ	10 U	10 U
Bromomethane	10	10 U	10 U	10 UJ	10 U	10 U
Vinyl Chloride	10	10 U	10 U	10 UJ	10 U	10 U
Chloroethane	10	10 U	10 U	10 UJ	10 U	10 U
Methylene Chloride	10	1 J	1 J	2 J	10 U	2 J
Acetone	10	10 U	10 U	10 UJ	10 U	10 U
Carbon Disulfide	10	10 U	10 U	10 UJ	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U	10 UJ	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloroethene(total)	10	10 U	10 U	10 UJ	10 U	10 U
Chloroform	10	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloroethane	10	10 U	10 U	10 UJ	10 U	10 U
2-Butanone	10	10 U	10 U	10 UJ	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U	10 UJ	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U	10 UJ	10 U	10 U
Bromodichloromethane	10	10 U	10 U	10 UJ	10 U	10 U
1,2-Dichloropropane	10	10 U	10 U	10 UJ	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U	10 UJ	10 U	10 U
Trichloroethene	10	10 U	10 U	10 UJ	10 U	10 U
Dibromochloromethane	10	10 U	10 U	10 UJ	10 U	10 U
1,1,2-Trichloroethane	10	10 U	10 U	10 UJ	10 U	10 U
Benzene	10	10 U	10 U	10 UJ	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U	10 UJ	10 U	10 U
Bromoform	10	10 U	10 U	10 UJ	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U	10 UJ	10 U	10 U
2-Hexanone	10	10 U	10 U	10 UJ	10 U	10 U
Tetrachloroethene	10	10 U	10 U	10 UJ	10 U	10 U
Toluene	10	10 U	10 U	10 UJ	10 U	10 U
1,1,2,2-Tetrachloroethane	10	R	R	10 UJ	10 U	R
Chlorobenzene	10	10 U	10 U	10 UJ	10 U	10 U
Ethylbenzene	10	10 U	10 U	10 UJ	10 U	10 U
Styrene	10	10 U	10 U	10 UJ	10 U	10 U
Total Xylenes	10	10 U	10 U	10 UJ	10 U	10 U
DILUTION FACTOR:		1	1	1	1	1
DATE SAMPLED:		06/28/94	06/29/94	06/30/94	07/01/94	06/29/94
DATE ANALYZED:		07/01/94	07/06/94	07/14/94	07/07/94	07/07/94
REMARKS:		Trip Blank	Trip Blank	Trip Blank	Trip Blank	Field Blank

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.
* – Value is reported from the [redacted]d ana[redacted]

Volatile Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		106030	105995
M&E SAMPLE ID:		FLDQC-FB2-06-30-QC-116	FLDQC-EB1-06-29-QC-114
COMPOUND	CRQL		
Chloromethane	10	10 U	10 U
Bromomethane	10	10 U	10 U
Vinyl Chloride	10	10 U	10 U
Chloroethane	10	10 U	10 U
Methylene Chloride	10	10 U	10 U
Acetone	10	10 U	10 U
Carbon Disulfide	10	10 U	10 U
1,1-Dichloroethene	10	10 U	10 U
1,1-Dichloroethane	10	10 U	10 U
1,2-Dichloroethene(total)	10	10 U	10 U
Chloroform	10	32	10 U
1,2-Dichloroethane	10	10 U	10 U
2-Butanone	10	10 U	10 U
1,1,1-Trichloroethane	10	10 U	10 U
Carbon Tetrachloride	10	10 U	10 U
Bromodichloromethane	10	16	10 U
1,2-Dichloropropane	10	10 U	10 U
cis-1,3-Dichloropropene	10	10 U	10 U
Trichloroethene	10	10 U	10 U
Dibromochloromethane	10	8 J	10 U
1,1,2-Trichloroethane	10	10 U	10 U
Benzene	10	10 U	10 U
trans-1,3-Dichloropropene	10	10 U	10 U
Bromoform	10	10 U	10 U
4-Methyl-2-pentanone	10	10 U	10 U
2-Hexanone	10	10 U	10 U
Tetrachloroethene	10	10 U	10 U
Toluene	10	10 U	10 U
1,1,2,2-Tetrachloroethane	10	10 U	R
Chlorobenzene	10	10 U	10 U
Ethylbenzene	10	10 U	10 U
Styrene	10	10 U	10 U
Total Xylenes	10	10 U	10 U
DILUTION FACTOR:		1	1
DATE SAMPLED:		06/30/94	06/29/94
DATE ANALYZED:		07/08/94	07/05/94
REMARKS:		Field Blank	Equipment Blank

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.
* – Value is reported from the diluted analysis.

Metcalf & Eddy
Data Review Worksheet

Site Name: Hancock NYANG
Project Number: 014541-0001-003
Project Description: SI Confirmatory Study
Comments:

LEVEL C EVALUATION OF VOLATILE ORGANIC CONTRACT LABORATORY DATA PACKAGE

The hard-copied (laboratory name) NET data package received at Metcalf & Eddy has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No. 1174 SAS No. NA
Job ~~SDG~~ No. 2053, 2072, 2085, 2095 Matrix Aq
No. of Samples 19 (including MS/MSD)

Sampling Date(s) 6/28, 29, 30, + 7/1 (1
Shipping Date(s) 6/28, 29, 30 + 7/1 (1994)
Date Rec'd by Lab 6/29, 6/30, 7/1, 7/2 (199

Traffic Report Nos.: See attached sheet (Table 1)
Field Blank Nos: FLDQC-FB1-06-29-QC-115, FLDQC-FB2-06-30-QC-1160
Trip Blank No.: FLDQC-06-28-TB-111, FLDQC-TB2-06-29-QC-112, FLDQC-TB3-06-30-QC-
Equipment Blank No.: FLDQC-EB1-06-29-QC-114
Field Dup Nos.: MEMW-007-06-28-FD-125, MEMW-007-06-28-MX-107
*Trip Blank No. (cont'd): FLDQC-TB4-07-01-QC-126

The general criteria used to determine the performance were based on an examination of:

- Holding Times
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Duplicates
- Field Duplicates
- GC/MS Tuning
- Calibrations
- Internal Standards

Overall comments: The trip blank slightly outside holding time. 1,1,2,2-Tetrachloroethe RRF and RRFs were low on the instrument, but the compound is not of concern w/ respect to the site and it was not detected. Blank actions were low w/ the exception of halogenated compounds found in tap water field blank => chlorinated water source - No actions necessa
Definitions and Qualifiers: 93 compounds were not detected. Data quality go
Over.

A - Acceptable data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Compound not detected

Reviewer: Constance Kapke Date: 7/28/94

Metcalf & Eddy
Data Review Worksheet

~~1 of 2~~ COL 7/27/94

A. SAMPLE HOLDING TIMES

Sample ID	Date Sample Collected	Date Sample Analyzed	Comments
MEMW-007-06-28-NX-107DL	06/28/94	07/01/94	criteria met
MEMW-007-06-28-~~NX~~-FD-125DL	06/28/94	07/06/94	
MEMW-007-06-28-FD-125	06/28/94	07/02/94	
FLDQC-06-28-TB-111	06/28/94	07/01/94	
MW-004-06-29-NX-104	06/29/94	07/05/94	
MW-004-06-29-NX-104MS	06/29/94	07/05/94	
MW-004-06-29-NX-104MSD	06/29/94	07/05/94	
FLDQC-FB1-06-29-QC-115	06/29/94	07/07/94	
MEMW-006-06-29-NX-106DL	06/29/94	07/06/94	
FLDQC-EB1-06-29-QC-114	06/29/94	07/05/94	
MW-003-06-29-NX-103DL	06/29/94	07/05/94	
FLDQC-TB2-06-29-QC-112	06/29/94	07/06/94	
MW-001-06-30-NX-101	06/30/94	07/09/94	
MW-002-06-30-NX-102DL	06/30/94	07/09/94	
MEMW-010-06-30-NX-110	06/30/94	07/09/94	
MEMW-008-06-30-NX-108	06/30/94	07/09/94	
FLDQC-FB2-06-30-QC-116	06/30/94	07/08/94	
FLDQC-TB3-06-30-QC-113	06/30/94	07/14/94	~3hr outside HT
MEMW-009-07-01-NX-109	07/01/94	07/07/94	criteria met
FLDQC-TB4-07-01-QC-126	07/01/94	07/07/94	

QC Criteria: All samples should be analyzed within 14 days of sample collection.

Action: If holding times are exceeded, all positive results are estimated (J) and non-detects are estimated (UJ). If holding times are grossly exceeded, the reviewer may reject non-detects as unusable(R).

DL => DL following the sample ID indicates the sample was diluted for the analysis indicated.

All samples analyzed w/in H.T. except FLDQC-TB3-06-30-QC-113
COL

Metcalf & Eddy
Data Review Worksheet

B-1. BLANK ANALYSIS RESULTS (Sections 1 & 2)

List the contamination in the blanks below.

1. Laboratory Blanks

Level: Low

Analysis Date	Sample ID	Matrix	Compound	Concentration/ Units
07/01/94	VBLK 070194E	Aq	4-Methyl-2-Pentanone	1 µg/L
↓	↓	↓	1,1,2,2-Tetrachloroethane	1 µg/L
07/06/94	VBLK 070694E	Aq	1,1,2,2-Tetrachloroethane	1 µg/L
07/07/94	VBLK 070794E	Aq	1,1,2,2-Tetrachloroethane	1 µg/L

2. Equipment, ~~Method~~ Field and Trip Blanks

Collected Date	Sample ID	Matrix	Compound	Concentration/ Units
06/28/94	FLDQC 06-28-TB-111	Aq	Methylene Chloride	1 µg/L
06/29/94	FLDQC-TB2 06-29-QC-112	Aq	Methylene Chloride	1 µg/L
06/30/94	FLDQC-TB3 06-29-QC-113	Aq	Methylene Chloride	2 µg/L
06/29/94	FLDQC-FB1 06-29-QC-115	Aq	Methylene Chloride	2 µg/L
06/30/94	FLDQC-FB2 06-30-QC-116	Aq	Chloroform	32 µg/L
↓	↓	↓	Bromodichloromethane	16 µg/L
			Dibromochloromethane	8 µg/L

A separate worksheet would be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheets

B-2. BLANK ANALYSIS RESULTS (Section 3)

3. Blank Actions

Action levels should be based upon the highest concentration of contaminant determined in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the compound in the sample exceeds the action level of 10 times the amount in the blank for common contaminants or 5 times the amount for any other compound. Specific actions are as follows:

1. If the concentration is less than or equal to the quantitation limit, report the CRQL and flag as non-detected (U).

2. If the concentration is greater than the CRQL, but less than the action level, report the concentration found and flag as non-detected (U).

3. If the concentration is greater than the action level, report the concentration unqualified.

Common contaminants: methylene chloride, acetone, 2-butanone, and toluene

LEVEL: Low

Compound	Max. Conc./Units	Action Level/Units	CRQL
4-Methyl-2-Pentanone	1 µg/L	5 µg/L	10 CDL 5 µg/L
1,1,2,2-Tetrachloroethane	1 µg/L	5 µg/L	10 µg/L
Methylene Chloride	2 µg/L	20 µg/L	10 µg/L
Chloroform	32 µg/L	160 µg/L	10 µg/L
Bromodichloromethane	16 µg/L	80 µg/L	10 µg/L
Dibromochloromethane	8 µg/L	40 µg/L	10 µg/L

A separate worksheet should be used for low and medium level blanks.

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Data Review Worksheet

C. Surrogate Spike Recoveries

List the surrogate recoveries which do not meet the criteria for surrogate recovery.

CLV 7/27

Matrix: Aq

Sample ID	Toluene-d8	~~4~~-Bromo-fluorobenzene	1,2-dichloro-ethane-d4	Comments
				All samples met criteria

QC Limits:	Toluene-d8	~~4~~-Bromo-fluorobenzene	1,2-dichloro-ethane-d4
	88	86	76
	to	to	to
	110	115	114

	% Recovery		
	<10%	10% to lower CRR	>higher CRR
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

CRR = Contract required recovery range as stated in the Validation Guidelines.

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Data Review Worksheets

D. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND PRECISION

Sample Nos. MW-004 06-29-NX-104MS and MSD Matrix: Aq

List the percent recoveries and RPDs of compounds which do not meet the QC criteria.

MS or MSD	Compound	%REC/ RPD	QC Limits
All criteria met.			

QUALIFICATION IS LIMITED TO THE UNSPIKED SAMPLE ONLY.

1. If any compound does not meet the Contract Required Recovery range (CRR) as stated in the Validation Guidelines, follow the actions stated below:

	% Recovery		
	<10%	10% to lower CRR	>higher CRR
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

2. If any compound does not meet the RPD criteria as stated in the Validation Guidelines, flag positive results for that compound in the associated unspiked sample as estimated (J).

A separate worksheet should be used for each MS/MSD pair.

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Data Review Worksheets

E. FIELD DUPLICATES

Sample Nos. MEMW-007-06 28-NX-107, MEMW-007-06-28-FD-.25DL Matrix: Ag

List the concentrations of the compounds which do not meet the following RPD criteria:

1. An RPD of <30% for water duplicates.
2. An RPD of <50% for soil duplicates.

COMPOUND	SAMPLE CONC	DUP SAMPLE CONC	RPD
All criteria met			

ACTIONS:

1. If the results for any compounds do not meet the RPD criteria, flag the positive results for that compound as estimated (J).

2. If one value is non-detected, and one is above the CRQL:

   a. Flag the positive result as estimated (J).
   b. Flag the non-detected result as estimated (UJ).

NOTE: Professional judgement may be utilized to apply duplicate actions to all samples of a similar matrix.

A separate worksheet should be filled out for each field duplicate pair.

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Data Review Worksheets

F. GC/MS TUNING

Yes The BFB performance results were reviewed and found to be within the specified criteria.

If no,
Samples affected: _____

If the ion abundance criteria is not met refer to the validation guidelines for expanded criteria. If necessary, all associated data should be qualified as rejected as unusable (R).

all criteria were met.

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Data Review Worksheets

G. CALIBRATION VERIFICATION

Date of Initial Calibration: 06/30/94
Dates of Continuing Calibrations: 7/1, 7/2, 7/5, 7/6, 7/7
Instrument ID: HP5970 E
Matrix/Level: Ag / Low

CRITERIA OUT

DATE	$\overline{RRF}$, %RSD, RRF, %D	COMPOUND (VALUE)
06/30/94	$\overline{RRF}$ in IC Samples Affected:	1,1,2,2-Tetrachloroethane (0.485) see attached Table 2
07/02/94	RRF in CC Samples Affected:	1,1,2,2-Tetrachloroethane (0.499) MEMW-CC7-06-28-FD-125
07/05/94	RRF in CC Samples Affected:	1,1,2,2-Tetrachloroethane (0.458) see attached Table 3
07/06/94	RRF in CC Samples Affected:	1,1,2,2-Tetrachloroethane (0.466) see attached Table 4
07/07/94	RRF in CC Samples Affected:	1,1,2,2-Tetrachloroethane (0.441) FLDQC-FB1-06-29-QC-115
	Samples Affected:	

QC CRITERIA:

1. All $\overline{RRF}$s and RRFs must meet minimum RRF criteria.
2. %RSDs must be <20.5% for all compounds except those listed in Exhibit D, Section 7.4.6 of the USEPA CLP SOW for Organic Analysis (OLM01.9).
3. %Ds must be ≤25% for all compounds except those listed in Exhibit D, Section 7.4.6 of the USEPA CLP SOW for Organic Analysis (OLM01.9).
4. All volatile organic compounds must meet the above criteria with allowance made for up to two compounds. However, the RRF must be ≥0.010 and the %RSD must be ≤40.0% for those two compounds.

ACTION:

1. If any compound has an initial $\overline{RRF}$ or a continuing RRF below criteria:
   a. Flag positive results for that compound as estimated (J).
   b. Flag non-detects for that compound as unusable (R).

2. If any compound has a %RSD or a %D outside of criteria:
   a. Flag positive results for that compound as estimated (J).
   b. Flag non-detects for that compound as estimated (UJ) if the %RSD or %D is >50%.

A separate worksheet should be filled out for each initial curve.

TABLE 2

MW-003-06-29-NX-103

MW-004-06-29-NX-104

MW-004-06-29-NX-104MS

MW-004-06-29-NX-104MSD

MEMW-006-06-29-NX-106

MEMW-007-06-28-NX-107

MEMW-007-06-28-FD-125

MEMW-007-06-28-FD-125DL

FLDQC-06-28-TB-111

FLDQC-TB2-06-29-QC-112

FLDQC-FB1-06-29-QC-115

FLDQC-EB1-06-29-QC-114

TABLE 3

MW-003-06-29-NX-103

MW-004-06-29-NX-104

MW-004-06-29-NX-104MS

MW-004-06-29-NX-104MSD

FLDQC-EB1-06-29-QC-114

TABLE 4

MEMW-006-06-29-NX-106

MEMW-007-06-28-FD-125DL

FLDQC-TB2-06-29-QC-112

Metcalf & Eddy
Data Review Worksheets

G. CALIBRATION VERIFICATION

Date of Initial Calibration: 07/06/94
Dates of Continuing Calibrations: 7/7, 7/8, 7/9
Instrument ID: HP5970 H
Matrix/Level: Ag / Low

CRITERIA OUT

DATE	$\overline{RRF}$, %RSD, RRF, %D	COMPOUND (VALUE)
—	All criteria met Samples Affected:	
—	Samples Affected:	
—	Samples Affected:	
—	Samples Affected:	
—	Samples Affected:	
—	Samples Affected:	

QC CRITERIA:

1. All $\overline{RRF}$s and RRFs must meet minimum RRF criteria.
2. %RSDs must be $<20.5\%$ for all compounds except those listed in Exhibit D, Section 7.4.6 of the USEPA CLP SOW for Organic Analysis (OLM01.9).
3. %Ds must be $\leq 25\%$ for all compounds except those listed in Exhibit D, Section 7.4.6 of the USEPA CLP SOW for Organic Analysis (OLM01.9).
4. All volatile organic compounds must meet the above criteria with allowance made for up to two compounds. However, the RRF must be ≥ 0.010 and the %RSD must be $\leq 40.0\%$ for those two compounds.

ACTION:

1. If any compound has an initial $\overline{RRF}$ or a continuing RRF below criteria:
   a. Flag positive results for that compound as estimated (J).
   b. Flag non-detects for that compound as unusable (R).

2. If any compound has a %RSD or a %D outside of criteria:
   a. Flag positive results for that compound as estimated (J).
   b. Flag non-detects for that compound as estimated (UJ) if the %RSD or %D is $>50\%$.

A separate worksheet should be filled out for each initial curve.

Metcalf & Eddy
Data Review Worksheets

G. CALIBRATION VERIFICATION

Date of Initial Calibration: 07/06/94
Dates of Continuing Calibrations: 07/14
Instrument ID: HP5970 K
Matrix/Level: Aq / Low

CRITERIA OUT

DATE	RRF, %RSD, RRF, %D	COMPOUND (VALUE)
	All criteria met.	
	Samples Affected:	
	Samples Affected:	
	Samples Affected:	
	Samples Affected:	
	Samples Affected:	
	Samples Affected:	

QC CRITERIA:

1. All $\overline{RRF}$s and RRFs must meet minimum RRF criteria.
2. %RSDs must be <20.5% for all compounds except those listed in Exhibit D, Section 7.4.6 of the USEPA CLP SOW for Organic Analysis (OLM01.9).
3. %Ds must be ≤25% for all compounds except those listed in Exhibit D, Section 7.4.6 of the USEPA CLP SOW for Organic Analysis (OLM01.9).
4. All volatile organic compounds must meet the above criteria with allowance made for up to two compounds. However, the RRF must be ≥0.010 and the %RSD must be ≤40.0% for those two compounds.

ACTION:

1. If any compound has an initial $\overline{RRF}$ or a continuing RRF below criteria:
   a. Flag positive results for that compound as estimated (J).
   b. Flag non-detects for that compound as unusable (R).

2. If any compound has a %RSD or a %D outside of criteria:
   a. Flag positive results for that compound as estimated (J).
   b. Flag non-detects for that compound as estimated (UJ) if the %RSD or %D is >50%.

A separate worksheet should be filled out for each initial curve.

H. INTERNAL STANDARD PERFORMANCE

List the internal standard area counts of samples which do not meet the criteria of +100% or -50% of the internal standard area in the associated continuing calibration standard.

SAMPLE ID	DATE	IS OUT	IS AREA/RT	ACCEPTABLE RANGE	ACTION
All criteria met					

ACTION:

1. If an IS area count is outside the criteria -50% or +100% of the associated standard:
   a. Qualify positive results for compounds quantitated using that IS quality as estimated (J).
   b. Qualify non-detected results for compounds quantitated using that IS as estimated (UJ).
   c. If extremely low area counts are reported, or if performance exhibits a major drop-off, then a severe loss of sensitivity is indicated. Non-detected results should then be qualified as unusable (R).

2. If an IS retention time varies more than 30 seconds, the chromatograms for that sample must be examined to determine if any false positive or negative results are reported. For shifts of a large magnitude, professional judgement may be used in considering partial or total rejection of the data for each associated sample.

PESTICIDE/PCB ANALYSES

Pesticides/PCBs

A Level C data validation was performed on the pesticide/PCB organic analytical data obtained from National Environmental Testing, Inc. for thirteen aqueous samples (and a MS/MSD pair) collected from the Hancock Field Site, New York Air National Guard Base, Syracuse, New York. M&E evaluated the data according to DOE/HWP-65/RI, "HAZWRAP Requirements for Quality Control of Analytical Data" (July, 1990), which was written for the 2/88 Organic Statement of Work (SOW) and incorporated validation actions consistent with the 3/90 Organic SOW.

The data were evaluated based on the examination of the following:

* Holding Times
* Calibrations
* Blanks
  Surrogate Recoveries
* Matrix Spike/Matrix Spike Duplicate Recoveries
* Field Duplicate Precision
* Florisil Cartridge Spike Recoveries
* Laboratory Control Sample Recoveries
* Peak Resolution

* All criteria were met for this parameter.

Table I summarizes the validation recommendations that are based on the following information:

Surrogates

All samples (with the exception of MEMW-008-06-30-NX-110, MW-004-06-29-NX-104MS, and MW-004-06-29-NX-104MSD) had surrogate recoveries outside the advisory limits of 60-150%. Per the analytical protocols, the laboratory was not required to reanalyze these samples. And, since the recovery limits are advisory only, qualification is left to professional judgement.

The data was qualified based on the following professional judgements:

Sample Identification	Data Qualification
MW-001-06-30-NX-101	Estimate (UJ) all non-detected values since the recoveries of both surrogate compounds on both quantitation and confirmation columns were below the advisory limits. (Note: No compounds were detected in this sample.)
MW-006-06-29-NX-106	Estimate (J) the detected value for Aroclor-1260 since the recovery of tetrachloro-m-xylene on both quantitation and confirmation columns were below the advisory limits, and the recovery of decachlorobiphenyl on the confirmation column was below the advisory limits. (Note: All other compounds were quantified as non-detected. No actions were applied to these compounds, since the recovery of decachlorobiphenyl on the quantitation column was within the advisory limits.)
All other samples (except as listed above on table and in text)	No qualifications were applied to the data since only the recoveries of one of the surrogate compounds (i.e., tetrachloro-m-xylene) were below the advisory limits, the recoveries of this surrogate were greater than 20%, and all compounds were quantified as non-detected.

Additional Comments

The quantitation of Aroclor-1260 in sample MW-006-06-29-NX-106 was calculated as 62 ug/l from instrument GC15F and as 90 ug/l from instrument GC15R. (Note: Both values were less than the contract required quantitation range (CRQL).) The relative percent difference (RPD) calculated from these values was 45.2%, which exceeded the 25% criteria. Therefore, the laboratory was required to report the lower value qualified as estimated (J). The data was deemed acceptable as qualified.

Table I: Recommendation Summary
for Pesticide/PCB Analyses Performed on Groundwater Samples
Hancock Field, NYANG, Syracuse, NY

Sample No.	Action
MW-001-06-30-NX-101	J[1]
MW-002-06-30-NX-102	A
MW-003-06-29-NX-103	A
MW-004-06-29-NX-104	A
MEMW-006-06-29-NX-106	J[2]
MEMW-007-06-28-NX-107	A
MEMW-007-06-28-FD-125	A
MEMW-008-06-30-NX-108	A
MEMW-009-07-01-NX-109	A
MEMW-010-06-30-NX-110	A
FLDQC-FB1-06-29-QC-115	A
FLDQC-FB2-06-30-QC-116	A
FLDQC-EB1-06-29-QC-114	A

A - Accept all data.

J[1] - Qualify as estimated (UJ) all non-detected results due to poor surrogate recovery (below advisory limits).

J[2] - Qualify as estimated (J) the results for Aroclor-1260 due to poor surrogate recovery (below advisory limits). The data was also qualified as estimated (J) by the laboratory since the RPD calculated between the values quantified from the two analytical columns exceeded the acceptable criteria.

Pesticide/PCB Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

	LABORATORY SAMPLE ID:	106026	106027	105996	105992	105994
	M&E SAMPLE ID:	MW-001-06-30-NX-101	MW-002-06-30-NX-102	MW-003-06-29-NX-103	MW-004-06-29-NX-104	MEMW-006-06-29-NX-106
COMPOUND	CRQL					
alpha-BHC	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
beta-BHC	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
delta-BHC	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
gamma-BHC	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
Heptachlor	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
Aldrin	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
Heptachlor epoxide	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
Endosulfan I	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
Dieldrin	0.10	0.01 UJ	0.13 U	0.11 U	0.11 U	0.10 U
4,4'-DDE	0.10	0.01 UJ	0.13 U	0.11 U	0.11 U	0.10 U
Endrin	0.10	0.01 UJ	0.13 U	0.11 U	0.11 U	0.10 U
Endosulfan II	0.10	0.01 UJ	0.13 U	0.11 U	0.11 U	0.10 U
4,4'-DDD	0.10	0.01 UJ	0.13 U	0.11 U	0.11 U	0.10 U
Endosulfan sulfate	0.10	0.01 UJ	0.13 U	0.11 U	0.11 U	0.10 U
4,4'-DDT	0.10	0.01 UJ	0.13 U	0.11 U	0.11 U	0.10 U
Methoxychlor	0.50	0.50 UJ	0.66 U	0.57 U	0.54 U	0.50 U
Endrin ketone	0.10	0.10 UJ	0.13 U	0.11 U	0.11 U	0.10 U
Endrin aldehyde	0.10	0.10 UJ	0.13 U	0.11 U	0.11 U	0.10 U
alpha-Chlordane	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
gamma-Chlordane	0.050	0.050 UJ	0.066 U	0.057 U	0.054 U	0.050 U
Toxaphene	5.0	5.0 UJ	6.6 U	5.7 U	5.4 U	5.0 U
Aroclor-1016	1.0	1.0 UJ	1.3 U	1.1 U	1.1 U	1.0 U
Aroclor-1221	2.0	2.0 UJ	2.6 U	2.3 U	2.2 U	2.0 U
Aroclor-1232	1.0	1.0 UJ	1.3 U	1.1 U	1.1 U	1.0 U
Aroclor-1242	1.0	1.0 UJ	1.3 U	1.1 U	1.1 U	1.0 U
Aroclor-1248	1.0	1.0 UJ	1.3 U	1.1 U	1.1 U	1.0 U
Aroclor-1254	1.0	1.0 UJ	1.3 U	1.1 U	1.1 U	1.0 U
Aroclor-1260	1.0	1.0 UJ	1.3 U	1.1 U	1.1 U	0.62 J
DILUTION FACTOR:		1	1.32	1.14	1.08	1
DATE SAMPLED:		06/30/94	06/30/94	06/29/94	06/29/94	06/29/94
DATE EXTRACTED:		07/05/94	07/05/94	06/30/94	06/30/94	06/30/94
DATE ANALYZED:		07/07/94	07/07/94	07/02/94	07/02/94	07/05/94
REMARKS:						

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Pesticide/PCB Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

	LABORATORY SAMPLE ID:	105915	105916	106029	106087	106028
	M&E SAMPLE ID:	MEMW-007-06-28-NX-107	MEMW-007-06-28-FD-125	MEMW-008-06-30-NX-108	MEMW-009-07-01-NX-109	MEMW-010-06-30-NX-110
COMPOUND	CRQL					
alpha-BHC	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
beta-BHC	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
delta-BHC	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
gamma-BHC	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
Heptachlor	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
Aldrin	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
Heptachlor epoxide	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
Endosulfan I	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
Dieldrin	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
4,4'-DDE	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
Endrin	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
Endosulfan II	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
4,4'-DDD	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
Endosulfan sulfate	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
4,4'-DDT	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
Methoxychlor	0.50	0.49 U	0.49 U	0.48 U	0.60 U	0.50 U
Endrin ketone	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
Endrin aldehyde	0.10	0.098 U	0.098 U	0.095 U	0.12 U	0.10 U
alpha-Chlordane	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
gamma-Chlordane	0.050	0.049 U	0.049 U	0.048 U	0.060 U	0.050 U
Toxaphene	5.0	4.9 U	4.9 U	4.8 U	6.0 U	5.0 U
Aroclor-1016	1.0	0.98 U	0.98 U	0.95 U	1.2 U	1.0 U
Aroclor-1221	2.0	2.0 U	2.0 U	1.9 U	2.4 U	2.0 U
Aroclor-1232	1.0	0.98 U	0.98 U	0.95 U	1.2 U	1.0 U
Aroclor-1242	1.0	0.98 U	0.98 U	0.95 U	1.2 U	1.0 U
Aroclor-1248	1.0	0.98 U	0.98 U	0.95 U	1.2 U	1.0 U
Aroclor-1254	1.0	0.98 U	0.98 U	0.95 U	1.2 U	1.0 U
Aroclor-1260	1.0	0.98 U	0.98 U	0.95 U	1.2 U	1.0 U
DILUTION FACTOR:		0.98	0.98	0.95	1.2	1
DATE SAMPLED:		06/28/94	06/28/94	06/30/94	07/01/94	06/30/94
DATE EXTRACTED:		06/30/94	06/30/94	07/05/94	07/05/94	07/06/94
DATE ANALYZED:		07/02/94	07/02/94	07/07/94	07/07/94	07/08/94
REMARKS:		Field Duplicate of 105916	Field Duplicate of 105915			

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Pesticide/PCB Water Analysis
µg/L
(SOW: 3/90)

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		105993	106030	105995
M&E SAMPLE ID:		FLDQC-FB1-06-29-QC-115	FLDQC-FB2-06-30-QC-116	FLDQC-EB1-06-29-QC-114
COMPOUND	CRQL			
alpha-BHC	0.050	0.051 U	0.052 U	0.055 U
beta-BHC	0.050	0.051 U	0.052 U	0.055 U
delta-BHC	0.050	0.051 U	0.052 U	0.055 U
gamma-BHC	0.050	0.051 U	0.052 U	0.055 U
Heptachlor	0.050	0.051 U	0.052 U	0.055 U
Aldrin	0.050	0.051 U	0.052 U	0.055 U
Heptachlor epoxide	0.050	0.051 U	0.052 U	0.055 U
Endosulfan I	0.050	0.051 U	0.052 U	0.055 U
Dieldrin	0.10	0.10 U	0.10 U	0.11 U
4,4'-DDE	0.10	0.10 U	0.10 U	0.11 U
Endrin	0.10	0.10 U	0.10 U	0.11 U
Endosulfan II	0.10	0.10 U	0.10 U	0.11 U
4,4'-DDD	0.10	0.10 U	0.10 U	0.11 U
Endosulfan sulfate	0.10	0.10 U	0.10 U	0.11 U
4,4'-DDT	0.10	0.10 U	0.10 U	0.11 U
Methoxychlor	0.50	0.51 U	0.52 U	0.55 U
Endrin ketone	0.10	0.10 U	0.10 U	0.11 U
Endrin aldehyde	0.10	0.10 U	0.10 U	0.11 U
alpha-Chlordane	0.050	0.051 U	0.052 U	0.055 U
gamma-Chlordane	0.050	0.051 U	0.052 U	0.055 U
Toxaphene	5.0	5.1 U	5.2 U	5.5 U
Aroclor-1016	1.0	1.0 U	1.0 U	1.1 U
Aroclor-1221	2.0	2.0 U	2.1 U	2.2 U
Aroclor-1232	1.0	1.0 U	1.0 U	1.1 U
Aroclor-1242	1.0	1.0 U	1.0 U	1.1 U
Aroclor-1248	1.0	1.0 U	1.0 U	1.1 U
Aroclor-1254	1.0	1.0 U	1.0 U	1.1 U
Aroclor-1260	1.0	1.0 U	1.0 U	1.1 U
DILUTION FACTOR:		1.02	1.03	1.1
DATE SAMPLED:		06/29/94	06/30/94	06/29/94
DATE EXTRACTED:		06/30/94	07/05/94	06/30/94
DATE ANALYZED:		07/02/94	07/07/94	07/02/94
REMARKS:		Field Blank	Field Blank	Equipment Blank

Footnotes:

CRQL – Contract Required Quantitation Limit.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Metcalf & Eddy
Data Review Worksheet

Site Name: Hancock NYANG
Project Number: 014541-0001-003
Project Description: SI Confirmatory Study
Comments: _____

LEVEL C EVALUATION OF PESTICIDE/PCB CONTRACT LABORATORY DATA PACKAGE

The hard-copied (laboratory name) NET data package received at Metcalf & Eddy has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No. 1174 SAS No. NA
Job ~~SDG~~ No. 2053, 2075, 2085, 2095 Matrix Aq
No. of Samples 19 (including MS/MSD)

Sampling Date(s) 6/28, 6/29, 6/30, & 7/1
Shipping Date(s) 6/28, 6/29, 6/30, & 7/1
Date Rec'd by Lab 6/29, 6/30, 7/1, & 7/2

Traffic Report Nos.: See attached sheet (Table 1)
Field Blank Nos: FLDQC-EB1-06-29-QC-115, FLDQC-EB2-06-30-QC-116
Trip Blank No.: NA
Equipment Blank No.: FLDQC-EB1-06-29-QC-114
Field Dup Nos.: MEMW-007-06-28-FD-125, MEMW-007-06-28-NX-107

The general criteria used to determine the performance were based on an examination of:

- Holding Times
- Blanks
- Surrogate Recoveries and Retention Times
- Matrix Spike/Matrix Spike Duplicates
- Field Duplicates
- Florisil Cartridge Spike Recoveries
- Calibrations
- Resolution
- LCS recoveries

Overall comments
Surrogate recoveries low - affected data minimally
No other problems

Definitions and Qualifiers:

A - Acceptable data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Compound not detected

Reviewer: PA Svetaka Date: 8-9-94

TABLE 1
Traffic Report Numbers

MW-001-06-30-NX-101

MW-002-06-30-NX-102

MW-003-06-29-NX-103

MW-004-06-29-NX-104

MW-004-06-29-NX-104MS

MW-004-06-29-NX-104MSD

MEMW-006-06-29-NX-105

MEMW-007-06-28-NX-107

MEMW-007-06-28-FD-125

MEMW-008-06-30-NX-108

MEMW-009-07-01-NX-109

MEMW-010-06-30-NX-110

~~FLDQC-06-28-TB-111~~ PAS 8-8-94

~~FLDQC-TB2-06-29-QC-112~~ PAS 8-8-94

~~FLDQC-TB3-06-30-QC-113~~ PAS 8-8-94

~~FLDQC-TB4-07-01-QC-126~~ PAS 8-8-94

FLDQC-FB1-06-29-QC-115

FLDQC-FB2-06-30-QC-116

FLDQC-EB1-06-29-QC-114

Metcalf & Eddy
Data Review Worksheet

A. SAMPLE HOLDING TIMES

Sample ID	Date Sample Collected	Date Sample Extracted	Date Sample Analyzed	Comments
MEMW-007-06-28-NX-107	06/28	06/30	07/02	all criteria met
MEMW-007-06-28-FD-125	06/28	06/30	07/02	
MW-004-06-29-NX-104	06/29	06/30	07/02	
FLDQC-FB1-06-29-QC-115	06/29	06/30	07/02	
MEMW-006-06-29-NX-106	06/29	06/30	07/05	
FLDQC-EB1-06-29-QC-114	06/29	06/30	07/02	
MW-003-06-29-NX-103	06/29	06/30	07/02	
MW-001-06-30-NX-101	06/30	07/05	07/07	
MW-002-06-30-NX-102	06/30	07/05	07/07	
MEMW-010-06-30-NX-110	06/30	07/06	07/08	
MEMW-008-06-30-NX-108	06/30	07/05	07/07	
FLDQC-FB2-06-30-QC-116	06/30	07/05	07/07	
MEMW-009-07-01-NX-109	07/01	07/05	07/07	
MW-004-06-29-NX-104MS	06/29	06/30	07/05	all criteria met
MW-004-06-29-NX-104MSD	06/29	06/30	07/05	

QC Criteria: All samples should be extracted within 7 days of sample collection, and analyzed within 40 days of extraction.

Action: If holding times are exceeded, all positive results are estimated (J) and non-detects are estimated (UJ). If holding times are grossly exceeded, the reviewer may reject non-detects as unusable(R).

Metcalf & Eddy
Data Review Worksheet

B-1. BLANK ANALYSIS RESULTS (Sections 1 & 2)

List the contamination in the blanks below.

1. Laboratory Blanks

Level: —

Date	Sample ID	Matrix	Compound	Concentration/ Units
No	contamination		reported	

2. Equipment, Method, and Field Blanks

Date	Sample ID	Matrix	Compound	Concentration/ Units
no	Contamination		reported.	

A separate worksheet would be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheets

B-2. BLANK ANALYSIS RESULTS (Section 3)

3. Blank Actions

Action levels should be based upon the highest concentration of contaminant determined in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the compound in the sample exceeds the action level of 5 times the amount in the blank for any compound. Specific actions are as follows:

1. If the concentration is less than or equal to the quantitation limit, report the CRQL and flag as non-detected (U).

2. If the concentration is greater than the CRQL, but less than the action level, report the concentration found and flag as non-detected (U).

3. If the concentration is greater than the action level, report the concentration unqualified.

LEVEL: _____

Compound	Max. Conc./Units	Action Level/Units	CRQL
	no contamination reported		

A separate worksheet should be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheet

C. Surrogate Spike Recoveries

List the surrogate recoveries which do not meet the criteria for surrogate recovery.

Matrix: Water

Sample ID	XTI5 #1 DCB Recovery	RTX35 #2 DCB	Comments	XTI5 #1 TCX	RTX35 #2 TCX
PBLK10630AC				44.0	49.1
PBLK10630AJ				46.0	47.2
PBLK10705AJ				39.9	42.4
PBLK10706AJ				46.4	47.0
PBLK20630AJ				48.7	53.4
PBLK20705AJ				44.6	48.9
FLDQC-EB1-06-29-QC-114				59.8	
FLDQC-FB1-06-29-QC-115				45.9	48.2
FLDQC-FB2-06-30-QC-116				26.9	29.8
MEMW-007-06-28-FD-125				23.8	34.6
MEMW-007-06-28-NX-107				27.1	30.6
MEMW-009-07-01-NX-109				40.2	43.9
MEMW-010-06-30-NX-110				21.8	21.6
6-8-94 PAS MEMW-001-06-30-NX-101	52.8	43.5		29.1	34.9
MW-002-06-30-NX-102				45.7	48.4
QC Limits:	60 to 150			60 to 150	

Note: Lab not required to reanalyze if QC limits are exceeded

Action - J hit < CRQL in MW-006-06-29-NX-106 since TCX recovery low on both columns & DCB recovery low on 2nd column. Hit below CRQL anyway.

QC Limits are advisory only and qualification of data is left to professional judgement.

MW-003-06-29-NX-103			44.5	46.1
MW-004-06-29-NX-104			44.2	47.2
MW-006-06-29-NX-106		5 58.6	35.1	37.4
PCB0630AJ			48.8	54.1
PCB0705AJ			45.9	50.4
PCB0706AJ	52.7	50.6	32.5	32.1

UJ NDs in MW-001-06-30-NX-101 since recoveries of all surrogates were low

No action for rest since DCB recoveries OK and TCX recoveries > 20%. Associated cmpds would probably have been detected if present

Only hit found was PCB-1260 in MW-006-05-29-NX-106.

Metcalf & Eddy
Data Review Worksheets

D. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND PRECISION

Sample Nos. MW-004-06 ; 29-NX-104 MS/MSD Matrix: water

List the percent recoveries and RPDs of compounds which do not meet the QC criteria.

MS or MSD	Compound	%REC/ RPD	QC Limits
	all within criteria		

QUALIFICATION IS LIMITED TO THE UNSPIKED SAMPLE ONLY.

1. If any compound does not meet the Contract Required Recovery range (CRR) as stated in the Validation Guidelines, follow the actions stated below:

	% Recovery		
	<10%	10% to lower CRR	>higher CRR
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

2. If any compound does not meet the RPD criteria as stated in the Validation Guidelines, flag positive results for that compound in the associated unspiked sample as estimated (J).

A separate worksheet should be used for each MS/MSD pair.

Metcalf & Eddy
Data Review Worksheets

E. FIELD DUPLICATES

Sample Nos. MEMW-007-06-28-NX-107, MEMW-007-06-28-FD-125 Matrix: water

List the concentrations of the compounds which do not meet the following RPD criteria:

1. An RPD of <30% for water duplicates.
2. An RPD of <50% for soil duplicates.

COMPOUND	SAMPLE CONC	DUP SAMPLE CONC	RPD
all within criteria — no hits			

ACTIONS:

1. If the results for any compounds do not meet the RPD criteria, flag the positive results for that compound as estimated (J).

2. If one value is non-detected, and one is above the CRQL:

   a. Flag the positive result as estimated (J).
   b. Flag the non-detected result as estimated (UJ).

NOTE: Professional judgement may be utilized to apply duplicate actions to all samples of a similar matrix.

A separate worksheet should be filled out for each field duplicate pair.

PESTICIDE INITIAL CALIBRATION FOR SINGLE COMPONENT ANALYTES (CLP FORM 6E)

List the single peak pesticide compounds that exceed 20% RSD or the surrogate compounds that exceed 30% RSD for the three point initial calibration.

Initial Calibration Date	Instrument ID	Compound	%RSD
	all within criteria		

1). Did more than two target pesticides have RSDs greater than 20%? Yes or (No)

2). Did any target pesticide or surrogate have an RSD greater than 30%? Yes or (No)

If yes to 1 or 2, state the validation actions taken below:

Retention times of all standards w/in RT windows - for pesticides & PCBs

PCBs - locked at minimum of 3 separate peaks for each compound for calibration.
All retention times w/in RT windows

PESTICIDE RESOLUTION CHECK
(CLP FORM 6G)

List the resolution between adjacent single peak pesticides in the resolution check mix that are less than 60.0% on either chromatographic column.

Analysis Date	Column	Compound	%Resolution
	all within criteria		

PESTICIDE CALIBRATION VERIFICATION
(CONTINUING CALIBRATION CLP FORMS 7D,7E)

List the percent difference for the pesticide compounds that exceed 25%. List the percent breakdown for 4,4'-DDT or Endrin that exceed 20.0% or the combined breakdown of these two compounds that exceed 30.0%.

Analysis Date	Compound	Column	%D/Breakdown	
	all within criteria except			
RPD for continuing calibration				
7-6-94	4,4'-DDT	XTI5	27	!
7-6-94	4,4'-DDT	RTX35	27	!

! - acceptable since only PCBs were being analyzed in this run

PESTICIDE SURROGATE RETENTION TIME CHECK
(CLP FORM 8D)

List the sample or standard in which one or both surrogates eluted outside their retention time window(s).

Analysis Date	Column	Sample or Standard	Surrogate Compound	RT Window	Surrogate RT
		all within criteria			

For affected samples, professional judgement should be used to determine if retention times are shifted early or late causing target pesticides to elute outside their established retention time windows.

PESTICIDE/PCB INITIAL CALIBRATION SEQUENCE

Was the initial calibration sequence followed as outlined in Part 6 Section III of the SOW? (Yes) or No

PESTICIDE FLORISIL CARTRIDGE SPIKE RECOVERIES
(CLP FORM 9A)

List the florisil cartridge spike pesticides that were recovered outside the QC limits of 80-120 percent recovery.

Date	Pesticide	% Recovery
all within criteria		

List the actions taken as a result of poor florisil cartridge spike recovery:

PCB ID for multicomponent analytes

7-5-94

MW-006-06-29-NX-106

Aroclor-1260 — 0.62 ~~ug/l~~ mg/l from Instrument GC15F } %d
0.90 ~~ug/l~~ mg/l " " GC15R } 4

PCB0630AJ

Aroclor-1016 — 3.8 ug/l from Instrument GC15F } %d
4.0 ug/l " " GC15R } 5

Aroclor-1260 — 3.8 ug/l " " GC15F } %
4.1 ug/l " " GC15R } = 7.

Note: Both values were < CRQL. Lower value was reported & flagged as estimated. (Exceeded 25% criteria - reported lower value)

Laboratory Control Sample Recoveries — aqueous

PCB-1016

7/5/94	70.0%	
7/6/94	58.0%	
7/7/94	121.0%	
QC limits from	37%	acceptable
to	132%	

PCB-1260

7/5/94	72.0%	
7/6/94	68.0%	
7/7/94	116%	
QC limits from	32%	
to	129%	acceptable

ortho-terphenyl

7/1/94	88.%	
7/5/94	84%	
QC limits from	50%	
to	150%	acceptable

DIESEL RANGE ORGANIC ANALYSES

Diesel Range Organic (DRO) Analysis

A Level C data validation was performed on the diesel range organic analytical data obtained from National Environmental Testing, Inc. for fifteen aqueous samples collected from the Hancock Field Site, New York Air National Guard Base, Syracuse, New York. M&E evaluated the data using validation actions derived from the EPA/API Method for Determination of Diesel Range Organics, and incorporated guidance from DOE/HWP-65/RI, "HAZWRAP Requirements for Quality Control of Analytical Data" (July, 1990).

The data were evaluated based on the examination of the following:

*	Holding Times	*	Field Duplicate Recoveries
	Blanks	*	LCS Recoveries
*	Surrogate Recoveries	*	Calibrations
	and Retention Times	*	Matrix Spike/Matrix Spike Duplicate

* All criteria were met for this parameter.

Table I summarizes the validation recommendations that are based on the following information:

Blanks

Contamination was reported in the equipment blank, sample FLDQC-EB1-06-29-QC-114, at a concentration of 113 μg/L. The action level was therefore 565 μg/L. It should be noted that the pattern of chromatographic peaks in the equipment blank differed from that in the JP-4 standards, and the contamination is therefore most likely not JP-4. However, results which are less than the action level have been qualified undetected (U). The only sample result which required qualification as a result of this action was MW-003-06-29-NX-103.

Additional Comments

Dilutions. It should be noted that two samples required dilution: Samples MEMW-007-06-28-NX-107 and sample MW-002-06-30-NX-102 were both reported at a 1:2 dilution.

Sample Results. The laboratory recalculated the sample concentrations after having printed the Form I's. The correct concentrations were located on the quantitation sheets with accompanied the sample chromatogram. The results reported on the Lotus table attached is taken from the quantitation sheets, and not from the Form I's.

Integration Range. It should be noted that the EPA/API Diesel Range Organics (DRO) method was modified in that JP-4 was used as a calibration standard. A range of integration

from C8-C15 was chosen to more closely reflect the range of the JP-4 standards used. This range was used instead of the C10-C28 range specified in the method. Results reported reflect a quantitation of jet propellant and fuels of a similar nature, and do not include quantitation of the heavier oils and lubricants. Criteria windows were adapted for use with the modified method.

Fuel Oil #6. In the chromatographs of several of the samples analyzed, a pattern of late-eluting peaks (LEPs) is visible after the OTP-surrogate peak. The pattern, which is regular, is indicative of oils and/or lubricants that are heavier than jet propellant, consists of semivolatile components, and ranges roughly from C20 - C32.

With the exception of the following samples, the same pattern of LEPs is apparent in all field samples to some degree: FLDQC-FB1-06-29-QC-106, FLDQC-FB2-06-30-QC-116, MEMW-008-06-30-NX-108, and MEMW-010-06-30-NX-110. Three samples in which the peak areas are significant in area when compared to the jet propellant concentration, MW-003-06-29-NX-103, MW-004-06-29-NX-104, and MW-006-06-29-NX-106, were reanalyzed by the laboratory for semivolatile compounds using GC/MS. Most of the peaks in question are not target analytes, but are reported in the library search (tentatively identified compounds or TIC) which accompanied the analysis. By adding the concentrations of each peak in the pattern (starting at a retention time of approximately 20 minutes), estimates of the concentrations are calculated assuming an RF=1, and are as follows:

MW-003-06-29-NX-103	30 μg/L
MW-004-06-29-NX-104	100 μg/L
MW-006-06-29-NX-106	200 μg/L

As these peaks are semivolatile compounds, it is recommended that further studies of contamination in this area include analysis for semivolatile compounds.

Table I: Recommendation Summary
for Diesel Range Organic Analyses Performed on Groundwater Samples
Hancock Field, NYANG, Syracuse, NY

Sample No.	Action
MW-001-06-30-NX-101	A
MW-002-06-30-NX-102DL	A
MW-003-06-29-NX-103	A[1]
MW-004-06-29-NX-104	A
MEMW-006-06-29-NX-106	A
MEMW-007-06-28-NX-107DL	A
MEMW-007-06-28-FD-125	A
MEMW-008-06-30-NX-108	A
MEMW-009-07-01-NX-109	A
MEMW-010-06-30-NX-110	A
FLDQC-FB1-06-29-QC-115	A
FLDQC-FB2-06-30-QC-116	A
FLDQC-EB1-06-29-QC-114	A

A - Accept all data.

A[1] - Qualify as undetected (U) due to contamination in the equipment blank.

Diesel Range Organics – Aqueous Analysis
µg/L

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		106026	106027	105996	105992
M&E SAMPLE ID:		MW-001-06-30-NX-101	MW-002-06-30-NX-102	MW-003-06-29-NX-103	MW-004-06-29-NX-104
COMPOUND	QL (µg/L)				
Jet Propellant	100	97 U	3130	376 U	118 U
DILUTION FACTOR:		1	2	1	1
DATE SAMPLED:		06/30/94	06/30/94	06/29/94	06/29/94
DATE EXTRACTED:		07/05/94	07/05/94	07/01/94	07/01/94
DATE ANALYZED:		07/09/94	07/13/94	07/11/94	07/09/94
REMARKS:		-----	-----	-----	-----

Footnotes:

QL – Quantitation Limit obtainable by the laboratory.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Diesel Range Organics – Aqueous Analysis
µg/L

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		105994	105915	105916	106029
M&E SAMPLE ID:		MEMW-006-06-29-NX-106	MEMW-007-06-28-NX-107	MEMW-007-06-28-FD-125	MEMW-008-06-30-NX-108
COMPOUND	QL (µg/L)				
Jet Propellant	100	1550	2890	3150	97 U
DILUTION FACTOR:		1	1	2	1
DATE SAMPLED:		06/29/94	06/28/94	06/28/94	06/30/94
DATE EXTRACTED:		07/01/94	07/01/94	07/01/94	07/05/94
DATE ANALYZED:		07/11/94	07/09/94	07/13/94	07/09/94
REMARKS:		-----	Field Duplicate of 105916	Field Duplicate of 105915	-----

Footnotes:

QL – Quantitation Limit obtainable by the laboratory.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Diesel Range Organics – Aqueous Analysis
µg/L

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		106087	106028	105993	106030
M&E SAMPLE ID:		MEMW-009-07-01-NX-109	MEMW-010-06-30-NX-110	FLDQC-FB1-06-29-QC-115	FLDQC-FB2-06-30-QC-116
COMPOUND	QL (µg/L)				
Jet Propellant	100	112 U	101 U	114 U	108 U
DILUTION FACTOR:		1	1	1	1
DATE SAMPLED:		07/01/94	06/30/94	06/29/94	06/30/94
DATE EXTRACTED:		07/05/94	07/05/94	07/01/94	07/05/94
DATE ANALYZED:		07/09/94	07/09/94	07/11/94	07/09/94
REMARKS:		-----	-----	Field Blank	Field Blank

Footnotes:

QL – Quantitation Limit obtainable by the laboratory.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Diesel Range Organics – Aqueous Analysis
µg/L

SITE: Hancock Field, NYANG

LABORATORY SAMPLE ID:		105995
M&E SAMPLE ID:		FLDQC-EB1-06-29-QC-114
COMPOUND	QL (µg/L)	
Jet Propellant	100	113
DILUTION FACTOR:		1
DATE SAMPLED:		06/29/94
DATE EXTRACTED:		07/01/94
DATE ANALYZED:		07/11/94
REMARKS:		-----

Footnotes:

QL – Quantitation Limit obtainable by the laboratory.
J – Quantitation is approximate due to limitations identified in the quality control review.
U – Value reported is the sample detection limit.
R – Value is rejected.
UJ – Sample detection limit is approximate due to limitations identified in the quality control review.

Table I: Recommendation Summary
for Diesel Range Organic Analyses Performed on Groundwater Samples
Hancock Field, NYANG, Syracuse, NY

Sample No.	Action
MW-001-06-30-NX-101	A
MW-002-06-30-NX-102DL	A
MW-003-06-29-NX-103	A[1]
MW-004-06-29-NX-104	A
MEMW-006-06-29-NX-106	A
MEMW-007-06-28-NX-107DL	A
MEMW-007-06-28-FD-125	A
MEMW-008-06-30-NX-108	A
MEMW-009-07-01-NX-109	A
MEMW-010-06-30-NX-110	A
FLDQC-FB1-06-29-QC-115	A
FLDQC-FB2-06-30-QC-116	A
FLDQC-EB1-06-29-QC-114	A

A - Accept all data.

A[1] - Qualify as undetected (U) due to contamination in the equipment blank.

Metcalf & Eddy
Data Review Worksheet

Site Name: Hancock NYANG
Project Number: 014541-0001-003
Project Description: SI Confirmatory Study
Comments:

LEVEL C EVALUATION OF TOTAL PETROLEUM HYDROCARBON (LUFT METHOD) DATA PACKAGE

The hard-copied (laboratory name) NET data package received at Metcalf & Eddy has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No. 1174 SAS No. NA
Job ~~SDG~~ No. 2053, 2075, 2085, 2095 Matrix Aq
No. of Samples 12 (including MS/MSD)

Sampling Date(s) 6/28, 6/29, 6/30, & 7/1
Shipping Date(s) 6/28, 6/29, 6/30, & 7/1
Date Rec'd by Lab 6/29, 6/30, 7/1, & 7/2

Traffic Report Nos.: See attached sheet (Table 1)
Field Blank Nos: FLDQC-FB1-06-29-QC-115, FLDQC-FB2-06-30-QC-116
Trip Blank No.: FLDQC-06-28-TB-111, FLDQC-TB2-06-29-QC-112; FLDQC-TB3-06-30-QC-1
Equipment Blank No.: FLDQC-EB1-06-29-QC-114
Field Dup Nos.: MEMW-007-06-28-FD-125; MEMW-007-06-28-NX-107

* TRIP BLK No. (cont'd): FLDQC-TB4-07-01-QC-126

The general criteria used to determine the performance were based on an examination of:

- Holding Times
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Duplicates
- Field Duplicates
- LCS Recoveries
- Calibrations

Overall comments Data was of reasonable quality. QC criteria were met as defined by lab & verified by M+E.

Definitions and Qualifiers:

A - Acceptable data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Compound not detected

Reviewer Constance Kepke Date: 07/09/94

Metcalf & Eddy
Data Review Worksheet

A. SAMPLE HOLDING TIMES

Sample ID	Date Sample Collected	Date Sample Extracted	Date Sample Analyzed	Comments
MEMW-007-06-28-NX-107	06/28	07/01	07/09	criteria met
MEMW-007-06-28-FD-125	06/28	07/01	07/09	
MEMW-007-06-28-FD-125DL	06/28	07/01	07/13	
MW-004-06-29-NX-104	06/29	07/01	07/09	
MW-004-06-29-NX-104MS	06/29	07/01	07/11	
MW-004-06-29-NX-104MSD	06/29	07/01	07/11	
FLDQL-FB1-06-29-NX-106	06/29	07/01	07/11	
MEMW-006-06-29-NX-106	06/29	07/01	07/11	
FLDQC-EB1-06-29-QC-114	06/29	07/01	07/11	
MW-003-06-29-NX-103	06/29	07/01	07/11	
MW-001-06-30-NX-101	06/30	07/05	07/09	
MW-002-06-30-NX-102	06/30	07/05	07/13	
MEMW-010-06-30-NX-110	06/30	07/05	07/09	
MEMW-008-06-30-NX-108	06/30	07/05	07/09	
FLDQC-FB2-06-30-QC-116	06/30	07/05	07/09	
MEMW-009-07-01-NX-109	07/01	07/05	07/09	
~~MEMW-007-06-28-FD-CK~~				

QC Criteria: All samples should be extracted within 7 days of sample collection, and analyzed within 40 days of extraction.

Action: If holding times are exceeded, all positive results are estimated (J) and non-detects are estimated (UJ). If holding times are grossly exceeded, the reviewer may reject non-detects as unusable(R).

Metcalf & Eddy
Data Review Worksheet

B-1. BLANK ANALYSIS RESULTS (Sections 1 & 2)

List the contamination in the blanks below.

1. Laboratory Blanks

Level: Low

Date	Sample ID	Matrix	Compound	Concentration/ Units
no	contamination reported			

2. Equipment and Field Blanks

Date	Sample ID	Matrix	Compound	Concentration/ Units
06/29	FLDQC-EB1 06-29-QC-114	Aq	~~TPH~~ JP	113 ug/L

A separate worksheet would be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheets

B-2. BLANK ANALYSIS RESULTS (Section 3)

3. Blank Actions

Action levels should be based upon the highest concentration of contaminant determined in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the compound in the sample exceeds the action level of 5 times the amount in the blank. Specific actions are as follows:

1. If the concentration is less than or equal to the quantitation limit, report the CRQL and flag as non-detected (U).

2. If the concentration is greater than the CRQL, but less than the action level, report the concentration found and flag as non-detected (U).

3. If the concentration is greater than the action level, report the concentration unqualified.

LEVEL: Low

Compound	Max. Conc./Units	Action Level/Units	CRQL
JP4 CAS JP	113 µg/L	565 µg/L	100 µg/L
		see validation memo for further discussion CAS	

A separate worksheet should be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheet

C. Surrogate Spike Recoveries

List the surrogate recoveries which do not meet the criteria for surrogate recovery.

Matrix: Ag

Sample ID	OTP Recovery	Comments
all criteria met for %recovery + retention time		

QC Limits: Recovery 50% to 150%

Retention Time : Initial Calibration ± 0.05 min

	% Recovery		
	<10%	10% to lower RR	>higher RR
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

RR = Recovery range.

Metcalf & Eddy
Data Review Worksheets

D. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND PRECISION

Sample Nos. MW-004-06 - MW-604-06 29-NX-104MS, 29-NX-104MSD Matrix: Aq

List the percent recoveries and RPDs of compounds which do not meet the QC criteria.

QC criteria => RPD ≤ 20%; %Rec 50-138%

MS or MSD	Compound	%REC/ RPD	QC Limits
all	criteria met		

QUALIFICATION IS LIMITED TO THE UNSPIKED SAMPLE ONLY.

1. If the results do not meet %Recovery criteria, follow the actions stated below:

	% Recovery		
	<10%	10% to lower CRR	>higher CRR
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

2. If any compound does not meet the RPD criteria, flag positive results for that compound in the associated unspiked sample as estimated (J).

A separate worksheet should be used for each MS/MSD pair.

Metcalf & Eddy
Data Review Worksheets

E. FIELD DUPLICATES

Sample Nos. MEMW-007- 06-28-NX-107 MEMW-007- 06-28-NX-FD-125 Matrix: Aq

List the concentrations of the compounds which do not meet the following RPD criteria:

1. An RPD of <30% for water duplicates.
2. An RPD of <50% for soil duplicates.

COMPOUND	SAMPLE CONC	DUP SAMPLE CONC	RPD
RPD < 30% => all criteria met			

ACTIONS:

1. If the results do not meet the RPD criteria, flag the positive results as estimated (J).

2. If one value is non-detected, and one is above the CRQL:

   a. Flag the positive result as estimated (J).
   b. Flag the non-detected result as estimated (UJ).

NOTE: Professional judgement may be utilized to apply duplicate actions to all samples of a similar matrix.

A separate worksheet should be filled out for each field duplicate pair.

Metcalf & Eddy
Data Review Worksheets

F. CALIBRATION VERIFICATION Date of Initial Calibration: 07/08/94
JP4 Calibration Dates of Continuing Calibrations: 07/09, 07/11 @ 12:19 *
Instrument ID: GC4
Matrix/Level: Low/A

CRITERIA OUT

DATE	RRF, %RSD, RRF, %D	COMPOUND (VALUE)
___	all criteria met	
___	Samples Affected:	
___	Samples Affected:	
___	Samples Affected:	
___	Samples Affected:	
___	Samples Affected:	
___	Samples Affected:	

QC CRITERIA:

1. %RSDs must be $\leq$20%.
2. %Ds must be $\leq$15%.

ACTION:

1. If %RSD or %D outside of criteria: Flag positive results as estimated (J).
2. If the %RSD or %D is >50%: Flag non-detects as estimated (UJ)

A separate worksheet should be filled out for each initial curve.

* Continuing Calibration Dates: 07/11 @ 17:34; 07/13 @ 12:48; 07/13 @ 17:15 (Cont'd)

Metcalf & Eddy
Data Review Worksheets

F. CALIBRATION VERIFICATION OTP Calibration

Date of Initial Calibration: 07/08/94
Dates of Continuing Calibrations: 07/09; 07/11 @ 11:13; *
Instrument ID: GC4
Matrix/Level: Hg Low

CRITERIA OUT

DATE	RRF, %RSD, RRF, %D	COMPOUND (VALUE)
—	all criteria met Samples Affected:	
—	Samples Affected:	
—	Samples Affected:	
—	Samples Affected:	
—	Samples Affected:	
—	Samples Affected:	

QC CRITERIA:

1. %RSDs must be $\leq$20%.
2. %Ds must be $\leq$15%.

ACTION:

1. If %RSD or %D outside of criteria: Flag positive results as estimated (J).
2. If the %RSD or %D is >50%: Flag non-detects as estimated (UJ)

A separate worksheet should be filled out for each initial curve.

* Continuing Calibration Dates (cont'd) = 07/11 @ 16:27; 07/13 @ 11:42; 07/13 @ ~~12:48~~ 16:08 opm

Metcalf & Eddy
Data Review Worksheet

G. LABORATORY CONTROL SPIKE (LCS) RECOVERIES

List the LCS recoveries which do not meet criteria.

Matrix: Aq

Sample ID	LCS Recovery	Comments
Criteria for LCS recoveries for both LCSs		were met

QC Limits: 50 to 150

	% Recovery		
	<10%	10% to lower RR	>higher RR
Positive Sample Results	J	J	J
Non-detected Sample Results	R	UJ	A

RR = Recovery range.

APPENDIX D. PESTICIDE STORAGE AREA - FIELD CHANGE ORDERS/VARIANCES

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 9
Page 1 of 3

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Field activities at the Pesticide Storage Area (Site 1) included monitoring well development until a minimum of 3 - 5 borehole volumes were removed. (Section 3.1)

Reason for Change:

The soils in which the wells were installed are silts with clay, causing the recharge rates to be extremely slow. It was the professional opinion of the field team that continuing with well development to achieve 3 borehole volumes would cost another two days without any additional benefit. Well parameters had stabilized after one borehole volume was withdrawn. One borehole volume was equivalent to 16 or more well volumes. The SAP had been changed between the draft and final versions to change the withdrawal volume from 3-5 *well* volumes to 3-5 *borehole* volumes, at the request of the state NYSDEC. A call was placed to NYSDEC to inquire about the need for the large removal volume. NYSDEC specified that monitoring wells must be developed until a minimum of 3 borehole volumes have been removed OR until well parameters have stabilized. Mr. Chen also stated that, if the well is pumped dry during development, it may be sampled as soon as it has recovered.

Recommended Disposition:

Withdraw a minimum of 3 to 5 *well* volumes AND until well parameters have stabilized. Obtain concurrence with the NYSDEC.

Impact on Present and Completed Work:

None.

Final Disposition:

The following volumes of water were withdrawn from each well: PEST-1R: 24 gallons, equivalent to one borehole volume and 16 well volumes; PEST-3R - 21.5 gallons, equivalent to 1 borehole volume and 16 well volumes; PEST-4 - 31.5 gallons, equivalent to 1 borehole volume and 18 well volumes. All well parameters had stabilized prior to ceasing well development. Mr. Marsden Chen of NYSDEC was in agreement with the approach taken.

Request by:
Field/Project Manager: Sandra M'Carron

Approvals:
HAZWRAP Project Manager: _____

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

7. FIELD CHANGE REQUEST FORM

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Field activities at the Pesticide Storage Area (Site 1) included installation of flush-mounted groundwater monitoring wells. (Section 2.5.3.2 of CS SAP and 5.3 of SI FSP)

Reason for Change:

Previous site visits had disclosed difficulties in locating the three groundwater monitoring wells in the Pesticide Storage Area (see Field Change No. 5). Two of the wells previously installed had been damaged so as to be unusable and requiring replacement. To prevent future damage to the newly installed wells, a recommendation was made to change the finished well from a flush-mounted to a standup, with protective guard posts.

Recommended Disposition:

Finish the monitoring wells as standups with protective guard posts.

Impact on Present and Completed Work:

None.

Final Disposition:

After discussion with Mr. Sager of the NYANG, it was agreed to finish the monitoring wells as standups and surround them with protective guard posts.

Request by:
Field/Project Manager: Sandra McCarron

Approvals:
HAZWRAP Project Manager: _____

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

Revision Date: May 1990

7. FIELD CHANGE REQUEST FORM

Field Change No.: 11
Page 3 of 3

Project: 174th TFW / Hancock Field, NYANG

Project No.: 91B-99791C / K-06

Applicable Document: Final Site Investigation Confirmatory Study Sampling and Analysis Plan

Description:

Field activities at the Pesticide Storage Area (Site 1) did not include sampling the drummed soils from the groundwater monitoring well installations. (Section 2.5.3.2)

Reason for Change:

To ensure appropriate disposal of boring cuttings, and as requested by Mr. B. Hedberg, HAZWRAP, and Mr. J. Lister, NYSDEC.

Recommended Disposition:

Collect two soil samples from the drummed soil boring cuttings that represent soil from 4' below ground surface to the bottom of the well, one for each of the replacement wells.

Impact on Present and Completed Work:

There are no impacts to the technical work being conducted. The addition of two more soil samples represents a cost impact only. ($229.50/sample) (2 samples) = $459.00

Final Disposition:

Two additional soil samples were taken, as requested.

Request by:
Field/Project Manager: Sandra M Carron

Approvals:
HAZWRAP Project Manager:

Note: The HAZWRAP Project Manager is notified of the need for change in project cost, schedule direction, or scope. This form does not satisfy Sect. 3, "Changes," of contract Terms and Conditions.

METCALF & EDDY, INC.

TELECON MEMORANDUM

3:10 pm

JOB NO. 014541-0001-002

DATE: 9-8-94

SUBJECT: Hancock - Pest. Storage Area Confirmatory Study

M&E ENGINEER: S. McCarron

OUTSIDE PARTY: Marsden Chen
NYSDEC
518-457-3976

MADE CALL ( )

REC'D CALL (X)

COMMENTS

SUMMARY OF CONVERSATION:

Called for Jim Lister re. monitoring well development at Hancock Field AFB.

A minimum of 3 borehole volumes must be removed OR until temperature and conductivity have stabilized.

If the well is pumped dry, it may be sampled as soon as it recovers.

CC: R. Alexander
B. Hedberg

APPENDIX E. PESTICIDE STORAGE AREA - MONITORING WELL AND SOIL BORING LOGS

MONITORING WELL WORKSHEETS

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock Confirmatory Job No. 014541-1-2 Samplers S. Hatfield/P. Atherton

Well ID Pest-1R Date Sampled 09/12/94 Time: Start 700 End 1240

Well Diameter 2 inches + 12 = 0.167 (d) ft. Well secured upon arrival? (Y)N

Depth of well from T.O.C. -- ft. Depth of water from T.O. PVC 9.41 ft.

Depth of water from T.O.C. -- ft. Depth of well from T.O. PVC 18.42 ft.

Feet of standing water -- (h) ft. Standing water (ft.) = 9.01

Standing Water Volume	taken from well volume table
	$= \pi[(d)^2+4](h)$
	$= 3.14[(.167 \text{ ft})^2+4](9 \text{ ft}) \times 7.48 \text{ gal/ft}^3 = 1.47 \text{ gals}$

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Bailers Purge: Time: Start 1030 End 1100

		pH	Conductivity	Temp. (F)	Time
1 well volume =	~ 1 gal.	7.05	674	15.7	1030
2 well volume =	~ 2 gal.	7.28	684	15.1	1040
3 well volume =	~ 3.75 gal.	7.39	695	13.8	1050
	~ 5 gal. Final =	7.35	688	13.7	1100

Final Water Level = _____ (from T.O. PVC)

Sample Collection: Time Start 1110 End 1240

Sampling Method Bailing - filtered/unfiltered Bailer Type Dedicated teflon

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum
Describe color:	colorless	black	(brown)	orange	red
Describe appearance:	turbid	(silty)	sand	clay	floaters
	clear	multiphased	foaming	slimy	algae
	sheen				

Organic Layer? No Length? -- Samples preserved? None (ice)

Comments * used for MS/MSD

Refer to the corresponding field log book - page(s) 22. (site logbook)

revised
1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock Confirmatory Job No. 014541-1-2 Samplers S. Hatfield/P. Atherton

Well ID Pest-2 Date Sampled 09/13/94 Time: Start 900 End 1630

Well Diameter 2 inches + 12 = 0.167 (d) ft. Well secured upon arrival? (Y)N

Depth of well from T.O.C. -- ft. Depth of water from T.O. PVC 10.25 ft.

Depth of water from T.O.C. -- ft. Depth of well from T.O. PVC 14.85 ft.

Feet of standing water -- (h) ft. Standing water (ft.) = 4.60

Standing Water Volume	taken from well volume table $= \pi[(d)^2+4](h)$ $= 3.14[(.167 \text{ ft})^2+4](4.6 \text{ ft}) \times 7.48 \text{ gal/ft}^3 = 0.75$ gals

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Bailers Purge: Time: Start 1030 End 1130

		pH	Conductivity	Temp. (F)	Time
1 well volume =	~ 2/3 gal.	7.37	541	13.5	1030
2 well volume =	~ 1.5 gal.	7.50	556	12.7	1100
3 well volume =	~ 2.5 gal.	7.53	560	12.6	1130
	~ 5 gal. Final =	--	--	--	--

Final Water Level = _____ (from T.O. PVC)

Sample Collection: Time Start 1130 End 1545

Sampling Method Bailing - filtered/unfiltered Bailer Type Teflon

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum
Describe color:	colorless	black	(brown)	orange	(red)
Describe appearance:	turbid	(silty)	sand	clay	floaters
	clear	multiphased	foaming	slimy	algae
	sheen				

Organic Layer? No Length? -- Samples preserved? None (ice)

Comments *Also had duplicate on well

ID'd MW-5R

Equipment blanks taken for bailer used (EB)

Field blanks also collected ID'd (AP-1 & IU-1) for tap and DIU water

Refer to the corresponding field log book - page(s) 28. (site logbook)

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock Confirmatory Job No. 014541-1-2 Samplers S. Hatfield/P. Atherton

Well ID Pest-3R Date Sampled 09/12/94 Time: Start 1140 End 1440

Well Diameter 2 inches + 12 = 0.167 (d) ft. Well secured upon arrival? Y/N

Depth of well from T.O.C. -- ft. Depth of water from T.O. PVC 10.34ft.

Depth of water from T.O.C. -- ft. Depth of well from T.O. PVC 18.68 ft.

Feet of standing water -- (h) ft. Standing water (ft.) = 8.34

Standing Water Volume = $\pi[(d)^2+4](h)$ taken from well volume table
= 3.14[(.167 ft)^2+4](8.34 ft) x 7.48 gal/ft^3 = 1.36 gals

PID Readings (ppm)
Breathing 0
Well 0

Purging Method Bailers Purge: Time: Start 1150 End 1220

		pH	Conductivity	Temp. (F)	Time
1 well volume =	~ 1.25 gal.	6.72	1104	16.8	1150
2 well volume =	~ 2.50 gal.	6.98	1134	16.7	1200
3 well volume =	~ 4.25 gal.	7.05	1136	15.4	1210
	~ 5.00 gal. Final =	7.08	1140	16.0	1220

Final Water Level = _____ (from T.O. PVC)

Sample Collection: Time Start 1305 End 1345

Sampling Method Bailing - filtered/unfiltered Bailer Type Dedicated Teflon

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum
Describe color:	colorless	black	(brown)	orange	(red)
Describe appearance:	turbid	(silty)	sand	clay	floaters
	clear	multiphased	foaming	slimy	algae
	sheen				

Organic Layer? No Length? -- Samples preserved? None (ice)

Comments _____

Refer to the corresponding field log book - page(s) 24. (site logbook)

revised
1/95

MONITORING WELL SAMPLING WORKSHEET

Job Name Hancock Confirmatory Job No. 014541-1-2 Samplers S. Hatfield/P. Atherton

Well ID Pest-4 Date Sampled 09/12/94 Time: Start 1330 End 1700

Well Diameter 2 inches + 12 = 0.167 (d) ft. Well secured upon arrival? (Y)N

Depth of well from T.O.C. -- ft. Depth of water from T.O. PVC 8.01ft.

Depth of water from T.O.C. -- ft. Depth of well from T.O. PVC 18.52ft.

Feet of standing water -- (h) ft. Standing water (ft.) = 10.51

Standing Water Volume	taken from well volume table
	$= \pi[(d)^2+4](h)$
	$= 3.14[(.167 \text{ ft})^2+4](10.5 \text{ ft}) \times 7.48 \text{ gal/ft}^3 = 1.72$ gals

PID Readings (ppm)

Breathing 0

Well 0

Purging Method Bailers Purge: Time: Start 1330 End 1555

		pH	Conductivity	Temp. (F)	Time
1 well volume =	~ 1.25 gal.	6.47	760	17.5	1330
2 well volume =	~ 3.0 gal.	6.65	917	16.8	1340
3 well volume =	~ 4.5 gal.	6.84	1244	16.0	1540
	~ 6.5 gal. Final =	6 86	916	16.8	1550
	~ 7.5 gal.	6.90	1017	16.0	1555

Final Water Level = (from T.O. PVC)

Sample Collection: Time Start 1600 End 1700

Sampling Method Bailing - filtered/unfiltered Bailer Type Dedicated Teflon

Sample Characteristics (Circle all applicable)

Describe odor:	(none)	sulfide	fishy	musty	petroleum
Describe color:	colorless	black	(brown)	orange	red
Describe appearance:	turbid	(silty)	sand	clay	floaters
	clear	multiphased	foaming	slimy	algae
	sheen				

Organic Layer? No Length? -- Samples preserved? None (ice)

Comments

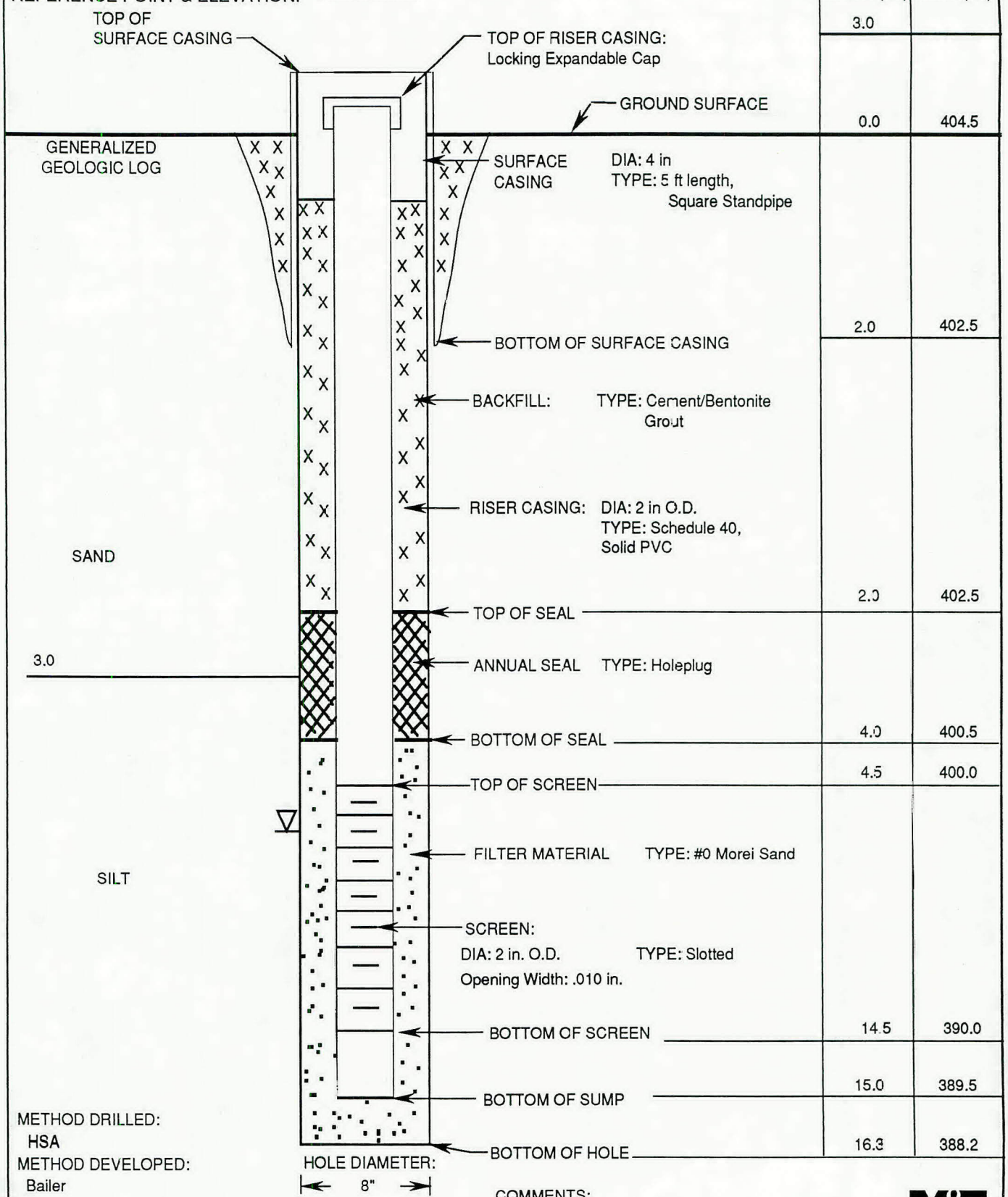
Refer to the corresponding field log book - page(s) 26. (site logbook)

revised
1/95

SOIL BORING LOGS

GROUND WATER INSTALLATION	PROJECT: Hancock ANG	JOB NO. 014541-0001-003	WELL NO. PEST -1R
DRILLING CONTRACTOR: American Auger	COORDINATES: N: 1,138,586.4 E: 631,196.5		
BEGUN: 9/7/94 FINISHED: 9/7/94	SUPERVISOR: R. Bursaw DRILLER: J. Pietruch	WELL SITE: Pesticide Storage Area	WATER LEVEL: (DEPTH)/ ELEV. 5.65 9/8/94

REFERENCE POINT & ELEVATION: Ground Surface



	DEPTH (FT)	ELEV.(FT)
	3.0	
	0.0	404.5
	2.0	402.5
	2.0	402.5
	4.0	400.5
	4.5	400.0
	14.5	390.0
	15.0	389.5
	16.3	388.2

METHOD DRILLED: HSA

METHOD DEVELOPED: Bailer

TIME DEVELOPED: 4.5 Hours

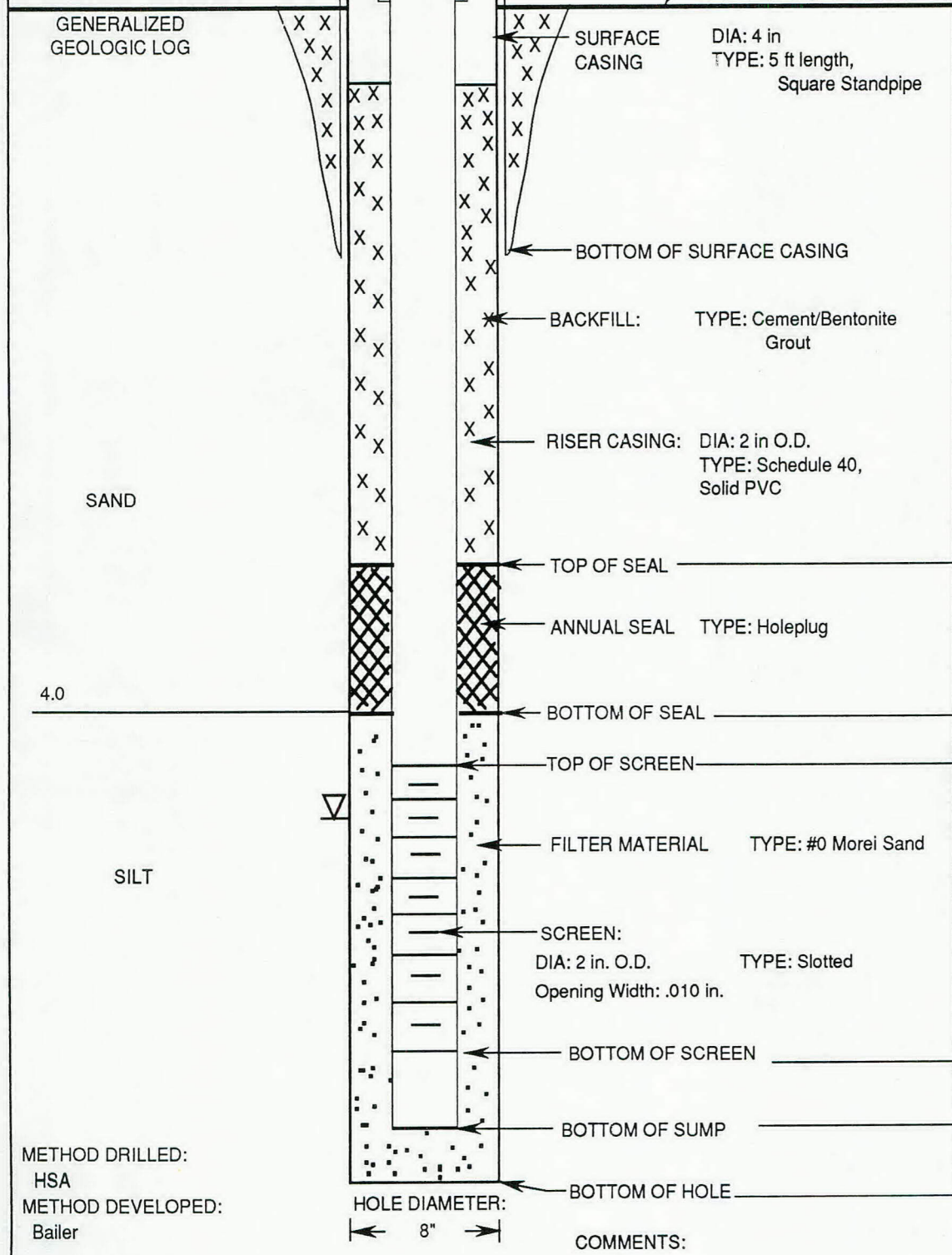
COMMENTS:

Metcalf & Eddy

4278jp

GROUND WATER INSTALLATION	PROJECT: Hancock ANG	JOB NO. 014541-0001-003	WELL NO. PEST -3R
DRILLING CONTRACTOR: American Auger	COORDINATES: N: 1,138,589.7 E: 631,264.9		
BEGUN: 9/6/94 FINISHED: 9/7/94	SUPERVISOR: R. Bursaw DRILLER: J. Pietruch	WELL SITE: Pesticide Storage Area	WATER LEVEL: (DEPTH) / ELEV. 6.98 9/8/94

REFERENCE POINT & ELEVATION: Ground Surface



	DEPTH (FT)	ELEV.(FT)
TOP OF SURFACE CASING	3.0	
GROUND SURFACE	0.0	403.0
BOTTOM OF SURFACE CASING	2.0	401.0
TOP OF SEAL	2.0	401.0
BOTTOM OF SEAL	4.0	399.0
TOP OF SCREEN	4.5	398.5
BOTTOM OF SCREEN	14.5	388.5
BOTTOM OF SUMP	15.0	388.0
BOTTOM OF HOLE	17.5	385.5

METHOD DRILLED: HSA

METHOD DEVELOPED: Bailer

TIME DEVELOPED: 7.5 Hours

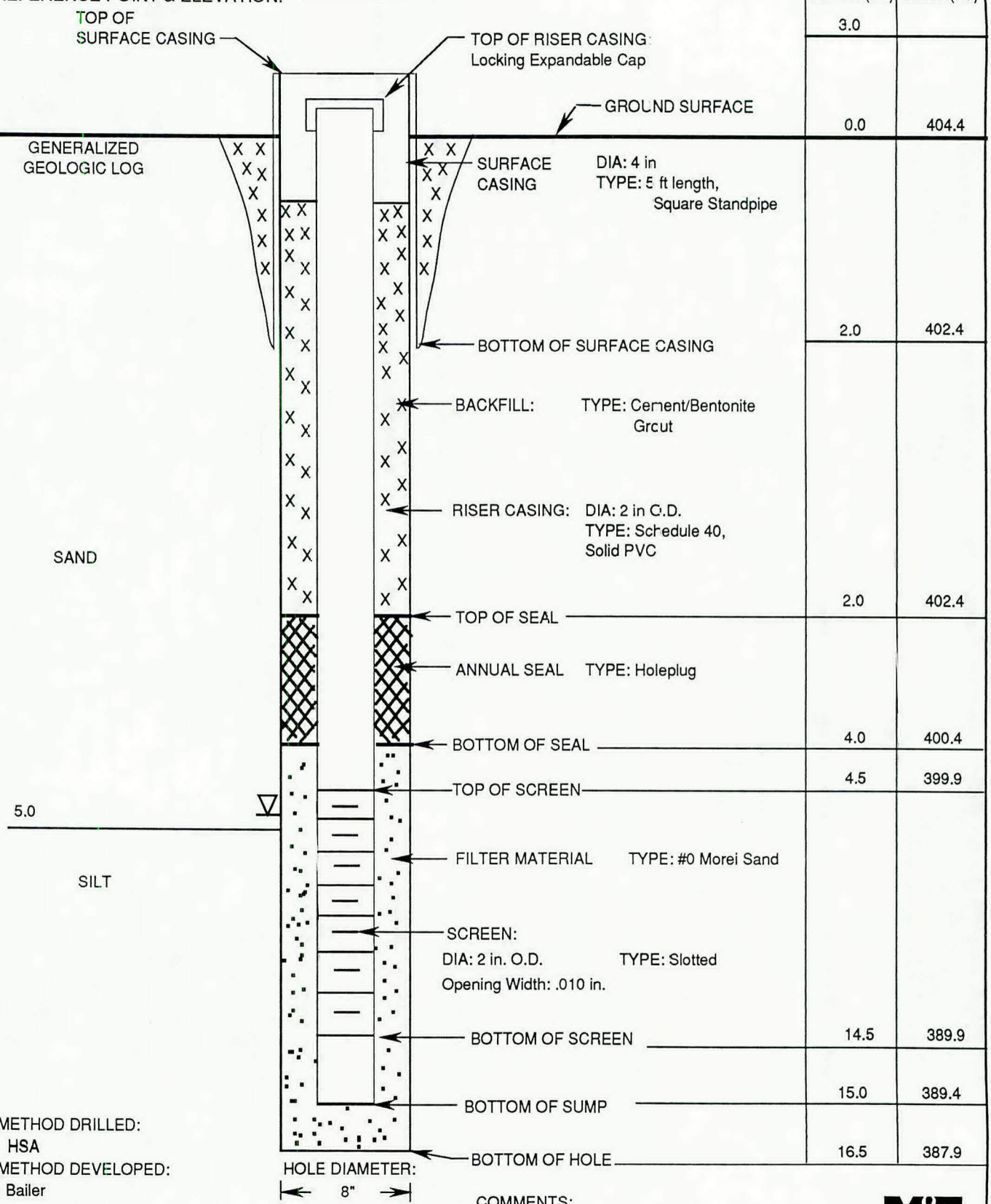
COMMENTS:

M&E Metcalf & Eddy

4278jp

GROUND WATER INSTALLATION	PROJECT: Hancock ANG	JOB NO. 014541-0001-003	WELL NO. PEST-4
DRILLING CONTRACTOR: American Auger	COORDINATES: N: 1,138,656.0 E: 631,128.8		
BEGUN: 9/6/94 FINISHED: 9/6/94	SUPERVISOR: R. Bursaw DRILLER: J. Pietruch	WELL SITE: Pesticide Storage Area	WATER LEVEL: (DEPTH)/ELEV. 4.71 9/8/94

REFERENCE POINT & ELEVATION: Ground Surface



DEPTH (FT)	ELEV.(FT)
3.0	
0.0	404.4
2.0	402.4
2.0	402.4
4.0	400.4
4.5	399.9
14.5	389.9
15.0	389.4
16.5	387.9

METHOD DRILLED: HSA

METHOD DEVELOPED: Bailer

TIME DEVELOPED: 6 Hours

HOLE DIAMETER: 8"

COMMENTS:

M&E Metcalf & Eddy

4278jp

Metcalf & Eddy, Inc.
ENGINEERS

GEOLOGIC LOG

PROJECT : **Hancock Air National Guard**		SHEET **1 OF 1**	BORING NO. **SB-01**
SITE LOCATION: **Syracuse, NY** **Hancock ANG**	JOB NO.: **014541**		
	LOCATION: **N: E:**	Ground Elevation: **404.6**	Total Depth (feet) **4.0**
DRILL CONTRACTOR: **American Auger**	ENG/GEO: **R. Bursaw**	BEGUN: **9/7/94**	
DRILL RIG: **Mobile B-57**	DRILLER: **J. Pietruch**	FINISHED: **9/7/94**	
Hole Size: **8"**	WEATHER: **Partial clouds, warm**	Ground Water (Depth/Elev.): **/**	
DRILLING METHOD: **HSA**	Drilling Fluid:	Top of Rock (Depth/Elev.):	

Depth	SAMPLE TYPE/NO.	PID Value (ppm)	Blow Counts (per 6 in.) or Drilling Rate (min./ft)	Sample Recovery or REC and RQD	SAMPLE DESCRIPTION	Elev. (USGS Datum) 404.6	STRATIGRAPHIC DESCRIPTION
	SS 1	0	3-10 8-8	17"	Silty SAND, fine with little med. to cse sand and fine subangular, gravel, brown, dry		Sand & Gravel Fill
	SS 2	0	7-8 12-11	18"	SAND, fine with trace inorg. silt, brown, dry		Outwash Sands
					Sandy SILT, little to trace clay, no dilatancy, low toughness and dry strength, brown, dry		Lacustrine Silt
							Bottom of Exploration @ 4.0 ft
5						400	
10						395	
15						390	
						385	

SAMPLE TYPES:
SS = Standard Split Spoon, S3 = 3" Split Spoon
NX = 2" Rock Core

NOTES: Pesticide Storage Area

Approved\Date

GHZ3 HANK 2/8/95

Metcalf & Eddy, Inc.
ENGINEERS

GEOLOGIC LOG

PROJECT : **Hancock Air National Guard**		SHEET **1 OF 1**	BORING NO. **SB-02**
SITE LOCATION: **Syracuse, NY** **Hancock ANG**	JOB NO.: **014541**		
	LOCATION: **N: E:**	Ground Elevation: **405.0**	Total Depth (feet) **4.0**
DRILL CONTRACTOR: **American Auger**	ENG/GEO: **R. Bursaw**	BEGUN: **9/7/94**	
DRILL RIG: **Mobile B-57**	DRILLER: **J. Pietruch**	FINISHED: **9/7/94**	
Hole Size: **8"**	WEATHER: **Partial clouds, warm**	Ground Water (Depth/Elev.): **/**	
DRILLING METHOD: **HSA**	Drilling Fluid:	Top of Rock (Depth/Elev.):	

Depth	SAMPLE TYPE/NO.	PID Value (ppm)	Blow Counts (per 6 in.) or Drilling Rate (min/ft)	Sample Recovery or REC and RQD	SAMPLE DESCRIPTION	Elev. (USGS Datum) 405.0	STRATIGRAPHIC DESCRIPTION
	SS 1	0	10-12 20-17	9"	SAND, fine with little med.-cse sand and fine angular gravel, trace inorg. silt, brown, dry		Sand & Gravel Fill
	SS 2	0	19-19 24-21	19"	SAND, fine with little inorg. silt, reddish-brown, dry		Outwash Sands
							Bottom of Exploration @ 4.0 ft
5						400	
10						395	
15						390	

SAMPLE TYPES:
SS = Standard Split Spoon, S3 = 3" Split Spoon
NX = 2" Rock Core

NOTES: Pesticide Storage Area

Approved\Date

GHZ3 HANK 2/6/95

Metcalf & Eddy, Inc.
ENGINEERS

GEOLOGIC LOG

PROJECT : **Hancock Air National Guard**		SHEET **1 OF 1**	BORING NO. **SB-03**
SITE LOCATION: **Syracuse, NY** **Hancock ANG**	JOB NO.: **014541**		
	LOCATION: **N: E:**	Ground Elevation: **403.0**	Total Depth (feet) **4.0**
DRILL CONTRACTOR: **American Auger**	ENG/GEO: **R. Bursaw**	BEGUN: **9/7/94**	
DRILL RIG: **Mobile B-57**	DRILLER: **J. Pietruch**	FINISHED: **9/7/94**	
Hole Size: **8"**	WEATHER: **Partial clouds, warm**	Ground Water (Depth/Elev.): **/**	
DRILLING METHOD: **HSA**	Drilling Fluid:	Top of Rock (Depth/Elev.):	

Depth	SAMPLE TYPE/NO.	PID Value (ppm)	Blow Counts (per 6 in.) or Drilling Rate (min/ft)	Sample Recovery or REC and RQD	SAMPLE DESCRIPTION	Elev. (USGS Datum) 403.0	STRATIGRAPHIC DESCRIPTION
	SS 1	0	9-11 9-11	21"	SAND, fine to cse with some fine subangular gravel, little to trace inorg. silt, gray, dry		Sand & Gravel Fill
	SS 2	0	12-8 7-8	16"	Silty fine SAND, some to little clay, trace med- cse sand and fine subangular gravel, brown, dry	400	
5						395	Bottom of Exploration @ 4.0 ft
10						390	
15						385	

SAMPLE TYPES:
SS = Standard Split Spoon, S3 = 3" Split Spoon
NX = 2" Rock Core

NOTES:

Approved\Date

GHZ3 HANK 2/8/95

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ENGINEERS

GEOLOGIC LOG

PROJECT: **Hancock Air National Guard**		SHEET **1 OF 1**	BORING NO. **SB-04**
SITE LOCATION: **Syracuse, NY** **Hancock ANG**	JOB NO.: **014541**		
	LOCATION: **N: E:**	Ground Elevation: **404.5**	Total Depth (feet) **4.0**
DRILL CONTRACTOR: **American Auger**	ENG/GEO: **R. Bursaw**	BEGUN: **9/7/94**	
DRILL RIG: **Mobile B-57**	DRILLER: **J. Pietruch**	FINISHED: **9/7/94**	
Hole Size: **8"**	WEATHER: **Partial clouds, warm**	Ground Water (Depth/Elev.): **/**	
DRILLING METHOD: **HSA**	Drilling Fluid:	Top of Rock (Depth/Elev.):	

Depth	SAMPLE TYPE/NO.	PID Value (ppm)	Blow Counts (per 6 in.) or Drilling Rate (min/ft)	Sample Recovery or REC and RQD	SAMPLE DESCRIPTION	Elev. (USGS Datum) 404.5	STRATIGRAPHIC DESCRIPTION
	SS 1	0	16-14 12-19	19"	Silty SAND, fine with little med-cse sand and fine angular gravel, brown, dry		Sand & Gravel Fill
	SS 2	0	10-14 17-12	20"	SAND, fine with little to trace inorg. silt, reddish-brown, dry		Outwash Sands
						400	Bottom of Exploration @ 4.0 ft
5							
						395	
10							
						390	
15							
						385	

SAMPLE TYPES:
SS = Standard Split Spoon, S3 = 3" Split Spoon
NX = 2" Rock Core

NOTES: Pesticide Storage Area

Approved\Date

GHZ3 HANK 2/6/95

Metcalf & Eddy, Inc.
ENGINEERS

GEOLOGIC LOG

PROJECT : **Hancock Air National Guard**		SHEET **1 OF 1**	BORING NO. **SB-05**
SITE LOCATION: **Syracuse, NY** **Hancock ANG**	JOB NO.: **014541**		
	LOCATION: **N: E:**	Ground Elevation: **404.4**	Total Depth (feet) **4.0**
DRILL CONTRACTOR: **American Auger**	ENG/GEO: **R. Bursaw**	BEGUN: **9/7/94**	
DRILL RIG: **Mobile B-57**	DRILLER: **J. Pietruch**	FINISHED: **9/7/94**	
Hole Size: **8"**	WEATHER: **Partial clouds, warm**	Ground Water (Depth/Elev.): **/**	
DRILLING METHOD: **HSA**	Drilling Fluid:	Top of Rock (Depth/Elev.):	

Depth	SAMPLE TYPE/NO.	PID Value (ppm)	Blow Counts (per 6 in.) or Drilling Rate (min/ft)	Sample Recovery or REC and RQD	SAMPLE DESCRIPTION	Elev. (USGS Datum) 404.4	STRATIGRAPHIC DESCRIPTION
	SS 1	0	7-14 22-18	20"	Silty SAND, fine with trace roots		Sand Fill
	SS 2	0	15-11 16-14	24"	Silty SAND, fine with trace roots SILT, some clay, trace fine sand, medium toughness and dry strength, no dilatancy, brown, dry		Lacustrine Silt
5						400	Bottom of Exploration @ 4.0 ft
10						395	
15						390	
						385	

SAMPLE TYPES:
SS = Standard Split Spoon, S3 = 3" Split Spoon
NX = 2" Rock Core

NOTES: Pesticide Storage Area

Approved\Date

GHZ3 HANK 2/6/95

Metcalf & Eddy, Inc.
ENGINEERS

GEOLOGIC LOG

PROJECT : **Hancock Air National Guard**		SHEET **1 OF 1**	BORING NO. **SB-06**
SITE LOCATION: **Syracuse, NY** **Hancock ANG**	JOB NO.: **014541**		
	LOCATION: **N: E:**	Ground Elevation: **405.3**	Total Depth (feet) **4.0**
DRILL CONTRACTOR: **American Auger**	ENG/GEO: **R. Bursaw**	BEGUN: **9/7/94**	
DRILL RIG: **Mobile B-57**	DRILLER: **J. Pietruch**	FINISHED: **9/7/94**	
Hole Size: **8"**	WEATHER: **Partial clouds, warm**	Ground Water (Depth/Elev.): **/**	
DRILLING METHOD: **HSA**	Drilling Fluid:	Top of Rock (Depth/Elev.):	

Depth	SAMPLE TYPE/NO.	PID Value (ppm)	Blow Counts (per 6 in.) or Drilling Rate (min/ft)	Sample Recovery or REC and RQD	SAMPLE DESCRIPTION	Elev. (USGS Datum) 405.3	STRATIGRAPHIC DESCRIPTION
	SS 1	0	6-7 13-19	12"	Silty SAND, fine with trace med. to cse sand, brown, dry	405	Sand Fill
	SS 2	0	11-15 14-10	24"	Silty SAND, fine trace med. to cse sand, brown, dry		Outwash Sands
5						400	Bottom of Exploration @ 4.0 ft
10						395	
15						390	

SAMPLE TYPES:
SS = Standard Split Spoon, S3 = 3" Split Spoon
NX = 2" Rock Core

NOTES:

Approved\Date

GHZ3 HANK 2/6/95

Metcalf & Eddy, Inc.
ENGINEERS

GEOLOGIC LOG

PROJECT : **Hancock Air National Guard**		SHEET **1 OF 1**	BORING NO. **SB-07**
SITE LOCATION: **Syracuse, NY** **Hancock ANG**	JOB NO.: **014541**		
	LOCATION: **N: E:**	Ground Elevation: **403.7**	Total Depth (feet) **4.0**
DRILL CONTRACTOR: **American Auger**	ENG/GEO: **R. Bursaw**	BEGUN: **9/7/94**	
DRILL RIG: **Mobile B-57**	DRILLER: **J. Pietruch**	FINISHED: **9/7/94**	
Hole Size: **8"**	WEATHER: **Partial clouds, warm**	Ground Water (Depth/Elev.): **/**	
DRILLING METHOD: **HSA**	Drilling Fluid:	Top of Rock (Depth/Elev.):	

Depth	SAMPLE TYPE/NO.	PID Value (ppm)	Blow Counts (per 6 in.) or Drilling Rate (min/ft)	Sample Recovery or REC and RQD	SAMPLE DESCRIPTION	Elev. (USGS Datum) 403.7	STRATIGRAPHIC DESCRIPTION
	SS 1	0	5-5 7-6	7"	SAND, fine to cse with little subangular gravel, trace inor. silt, brown, dry		Sand Fill
	SS 2	0	17-7 9-14	13"	SILT, little to trace fine sand and clay, no dilatancy, low dry strength and toughness, brown, dry	400	Lacustrine Silt
							Bottom of Exploration @ 4.0 ft
5						395	
10						390	
15						385	

SAMPLE TYPES:
SS = Standard Split Spoon, S3 = 3" Split Spoon
NX = 2" Rock Core

NOTES:

Approved\Date

GHZ3 HANK 2/6/95

APPENDIX F. PESTICIDE STORAGE AREA - DATA VALIDATION

SOIL ANALYSES RESULTS

Pesticide/PCB Soil Analysis
ug/Kg
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1175,1197

M&E SAMPLE ID:		SB1-0-2-NX-201	SB1-2-4-NX-202	SB2-0-2-NX-203	SB2-2-4-NX-204	SB3-0-2-NX-205	SB3-2-4-NX-206
Laboratory ID:		109563	109564	109565	109566	109567	109579
COMPOUND	CRQL						
alpha-BHC	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
beta-BHC	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
delta-BHC	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
gamma-BHC(Lindane)	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Heptachlor	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Aldrin	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Heptachlor Epoxide	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Endosulfan I	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Dieldrin	3.3	31	3.9 U	85	1.4 J	3.7 U	4.1 U
4,4'-DDE	3.3	390	12	72 J	4.0 U	11	4.1 U
Endrin	3.3	7.3 U	3.9 U	3.6 U	4.0 U	3.7 U	4.1 U
Endosulfan II	3.3	7.3 U	3.9 U	3.6 U	4.0 U	3.7 U	4.1 U
4,4'-DDD	3.3	96 J	3.9 U	78 J	3.7 J	3.0 J	4.1 U
Endosulfan Sulfate	3.3	12 J	3.9 U	23 J	8.0 J	3.7 U	4.1 U
4,4'-DDT	3.3	3400	110	500	18	3.7 U	4.1 U
Methoxychlor	17.0	38 U	20 U	5.5 J	20 U	19 U	21 U
Endrin Ketone	3.3	7.3 U	3.9 U	3.6 U	4.0 U	3.7 U	4.1 U
Endrin Aldehyde	3.3	7.3 U	3.9 U	3.6 U	4.0 U	3.7 U	4.1 U
alpha-Chlordane	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
gamma-Chlordane	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Toxaphene	170.0	380 U	200 U	180 U	200 U	190 U	210 U
Aroclor-1016	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1221	67.0	150 U	80 U	73 U	81 U	75 U	83 U
Aroclor-1232	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1242	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1248	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1254	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1260	33.0	73 U	39 U	36 U	40 U	37 U	41 U
DILUTION FACTOR:		2/50/200	1/5	1/10	1	1	1
SAMPLE WEIGHT (g):		30	30	30	30	30	30
PERCENT SOLIDS:		90	84	92	83	89	81
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/07/94	09/07/94	09/07/94	09/07/94	09/07/94	09/07/94
DATE EXTRACTED:		09/12/94	09/12/94	09/12/94	09/12/94	09/12/94	09/12/94
DATE ANALYZED:		09/20/94	09/16/94	09/16/94	09/16/94	09/16/94	09/17/94
REMARKS:		Duplicate of SB-1-0-2-FD1-215					

Footnotes:

- CRQL - Contract Required Quantitation Limit.
- J - Quantitation is approximate due to limitations identtified in the quality control review.
- U - Value is the sample detection limit.
- R - Value is rejected.
- UJ - Sample detection limit is approximate due to limitations identified in the quality control review.

Pesticide/PCB Soil Analysis
ug/Kg
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1175,1197

M&E SAMPLE ID:		SB4-0-2-NX-207	SB4-2-4-NX-208	SB5-0-2-NX-209	SB5-2-4-NX-210	SB6-0-2-NX-211	SB6-2-4-NX-212
Laboratory ID:		109568	109569	109570	109571	109572	109573
COMPOUND	CRQL						
alpha-BHC	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
beta-BHC	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
delta-BHC	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
gamma-BHC(Lindane)	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
Heptachlor	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
Aldrin	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
Heptachlor Epoxide	1.7	2.0 U	2.0 U	2.1 U	2.2 U	8.4 J	2.3 U
Endosulfan I	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
Dieldrin	3.3	3.8 U	3.9 U	3.1 J	4.2 U	13	4.5 U
4,4'-DDE	3.3	74	2.6 J	120	4.2 U	98	4.5 U
Endrin	3.3	3.8 U	3.9 U	4.1 U	4.2 U	3.9 U	4.5 U
Endosulfan II	3.3	3.8 U	3.9 U	4.1 U	4.2 U	3.9 U	4.5 U
4,4'-DDD	3.3	32 J	3.0 J	15 J	4.2 U	4.5 J	4.5 U
Endosulfan Sulfate	3.3	6.0 J	3.9 U	5.0 J	4.2 U	3.9 U	4.5 U
4,4'-DDT	3.3	160	8.9	52	4.2 U	77	4.5 U
Methoxychlor	17.0	20 U	20 U	21 U	22 U	20 U	23 U
Endrin Ketone	3.3	3.8 U	3.9 U	4.1 U	4.2 U	3.9 U	4.5 U
Endrin Aldehyde	3.3	3.8 U	3.9 U	4.1 U	4.2 U	3.9 U	4.5 U
alpha-Chlordane	1.7	2.0 U	2.0 U	6.5 J	2.2 U	5.6 J	2.3 U
gamma-Chlordane	1.7	2.0 U	2.0 U	3.1 J	2.2 U	1.5 J	2.3 U
Toxaphene	170.0	200 U	200 U	210 U	220 U	200 U	230 U
Aroclor-1016	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1221	67.0	77 U	80 U	83 U	85 U	79 U	91 U
Aroclor-1232	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1242	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1248	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1254	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1260	33.0	38 U	39 U	41 U	42 U	39 U	45 U
DILUTION FACTOR:		1/10	1	1/5	1	1/2	1
SAMPLE WEIGHT (g):		30	30	30	30	30	30
PERCENT SOLIDS:		87	84	81	79	85	74
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/07/94	09/07/94	09/07/94	09/07/94	09/07/94	09/07/94
DATE EXTRACTED:		09/12/94	09/12/94	09/12/94	09/12/94	09/12/94	09/12/94
DATE ANALYZED:		09/16/94	09/16/94	09/16/94	09/16/94	09/16/94	09/16/94
REMARKS:							Duplicate of SB-2-4-FD2-216

Footnotes:
- CRQL - Contract Required Quantitation Limit.
- J - Quantitation is approximate due to limitations identtified in the quality control review.
- U - Value is the sample detection limit.
- R - Value is rejected.
- UJ - Sample detection limit is approximate due to limitations identified in the quality control review.

Pesticide/PCB Soil Analysis
ug/Kg
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1175,1197

M&E SAMPLE ID:		SB7-0-2-NX-213	SB7-2-4-NX-214	SB-1-0-2-FD1-215	SB-2-4-FD2-216	WB-3R-09-08-NX-221	WB-1R-09-08-NX-222
Laboratory ID:		109574	109575	109576	109577	109580	109578
COMPOUND	CRQL						
alpha-BHC	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
beta-BHC	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
delta-BHC	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
gamma-BHC(Lindane)	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Heptachlor	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Aldrin	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Heptachlor Epoxide	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Endosulfan I	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Dieldrin	3.3	140	4.3 U	36 J	4.1 U	4.3 U	8.5 U
4,4'-DDE	3.3	350	4.3 U	500	4.1 U	150	17
Endrin	3.3	3.6 U	4.3 U	37 U	4.1 U	4.3 U	8.5 U
Endosulfan II	3.3	3.6 U	4.3 U	37 U	4.1 U	4.3 U	8.5 U
4,4'-DDD	3.3	830 J	5.2 J	110 J	4.1 U	160 J	3.1 J
Endosulfan Sulfate	3.3	130 J	4.3 U	37 U	4.1 U	4.3 U	8.5 U
4,4'-DDT	3.3	920	7.7	4600	4.1 U	2600	64
Methoxychlor	17.0	19 U	22 U	190 U	21 U	22 U	44 U
Endrin Ketone	3.3	3.6 U	4.3 U	37 U	4.1 U	4.3 U	8.5 U
Endrin Aldehyde	3.3	3.6 U	4.3 U	37 U	4.1 U	4.3 U	8.5 U
alpha-Chlordane	1.7	5.6 J	2.2 U	19 U	2.1 U	2.7 J	4.4 U
gamma-Chlordane	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Toxaphene	170.0	190 U	220 U	1900 U	210 U	220 U	440 U
Aroclor-1016	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1221	67.0	74 U	88 U	750 U	84 U	88 U	170 U
Aroclor-1232	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1242	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1248	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1254	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1260	33.0	36 U	43 U	370 U	41 U	43 U	84.6 U
DILUTION FACTOR:		1/25	1	10/100	1	1	2
SAMPLE WEIGHT (g):		30	30	30	30	30	30
PERCENT SOLIDS:		91	76	89	80	76	78
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/07/94	09/07/94	09/07/94	09/07/94	09/08/94	09/08/94
DATE EXTRACTED:		09/12/94	09/12/94	09/12/94	09/12/94	09/12/94	09/12/94
DATE ANALYZED:		09/16/94	09/21/94	09/21/94	09/17/94	09/17/94	09/21/94
REMARKS:				Duplicate of SB1-0-2-NX-201	Duplicate of SB6-2-4-NX-212		

Footnotes:

- CRQL - Contract Required Quantitation Limit.
- J - Quantitation is approximate due to limitations identtified in the quality control review.
- U - Value is the sample detection limit.
- R - Value is rejected.
- UJ - Sample detection limit is approximate due to limitations identified in the quality control review.

AQUEOUS ANALYSES RESULTS

Pesticide/PCB Aqueous Analysis
ug/L
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1197

M&E SAMPLE ID:		MW-1R	MW-1RF	MW-3R	MW-3RF	MW-4R	MW-4RF
Laboratory ID:		109629	109632	109630	109633	109631	109634
COMPOUND	CRQL						
alpha-BHC	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
beta-BHC	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
delta-BHC	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
gamma-BHC(Lindane)	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
Heptachlor	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
Aldrin	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
Heptachlor Epoxide	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
Endosulfan I	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
Dieldrin	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
4,4'-DDE	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
Endrin	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
Endosulfan II	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
4,4'-DDD	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
Endosulfan Sulfate	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
4,4'-DDT	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
Methoxychlor	0.50	0.56 U	0.50 U	0.48 U	0.49 U	0.49 U	0.48 U
Endrin Ketone	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
Endrin Aldehyde	0.10	0.11 U	0.10 U	0.096 U	0.098 U	0.098 U	0.096 U
alpha-Chlordane	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
gamma-Chlordane	0.05	0.056 U	0.050 U	0.048 U	0.049 U	0.049 U	0.048 U
Toxaphene	5.0	5.6 U	5.0 U	4.8 U	4.9 U	4.9 U	4.8 U
Aroclor-1016	1.0	1.1 U	1.0 U	0.96 U	0.98 U	0.98 U	0.96 U
Aroclor-1221	2.0	2.2 U	2.0 U	1.9 U	2.0 U	2.0 U	1.9 U
Aroclor-1232	1.0	1.1 U	1.0 U	0.96 U	0.98 U	0.98 U	0.96 U
Aroclor-1242	1.0	1.1 U	1.0 U	0.96 U	0.98 U	0.98 U	0.96 U
Aroclor-1248	1.0	1.1 U	1.0 U	0.96 U	0.98 U	0.98 U	0.96 U
Aroclor-1254	1.0	1.1 U	1.0 U	0.96 U	0.98 U	0.98 U	0.96 U
Aroclor-1260	1.0	1.1 U	1.0 U	0.96 U	0.98 U	0.98 U	0.96 U
DILUTION FACTOR:		1	1	1	1	1	1
SAMPLE VOLUME:		890	1000	1040	1020	1020	1040
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/12/94	09/12/94	09/12/94	09/12/94	09/12/94	09/12/94
DATE EXTRACTED:		09/15/94	09/13/94	09/13/94	09/13/94	09/13/94	09/13/94
DATE ANALYZED:		09/22/94	09/22/94	09/21/94	09/22/94	09/21/94	09/22/94
REMARKS:							

Footnotes:

CRQL - Contract Required Quantitation Limit.
J - Quantitation is approximate due to limitations identtified in the quality control review.
U - Value is the sample detection limit.
R - Value is rejected.
UJ - Sample detection limit is approximate due to limitations identified in the quality control review.

Pesticide/PCB Aqueous Analysis
ug/L
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1197

M&E SAMPLE ID:		MW-2R	MW-2RF	MW-5R	MW-5RF	AP-1	IU-1
Laboratory ID:		109689	109692	109693	109693	109687	109688
COMPOUND	CRQL						
alpha-BHC	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
beta-BHC	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
delta-BHC	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
gamma-BHC(Lindane)	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
Heptachlor	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
Aldrin	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
Heptachlor Epoxide	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
Endosulfan I	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
Dieldrin	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
4,4'-DDE	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
Endrin	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
Endosulfan II	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
4,4'-DDD	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
Endosulfan Sulfate	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
4,4'-DDT	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
Methoxychlor	0.50	0.52 U	0.50 U	0.50 U	0.50 U	0.50 U	0.56 U
Endrin Ketone	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
Endrin Aldehyde	0.10	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.11 U
alpha-Chlordane	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
gamma-Chlordane	0.05	0.052 U	0.050 U	0.050 U	0.050 U	0.050 U	0.056 U
Toxaphene	5.0	5.2 U	5.0 U	5.0 U	5.0 U	5.0 U	5.6 U
Aroclor-1016	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
Aroclor-1221	2.0	2.1 U	2.0 U	2.0 U	2.0 U	2.0 U	2.2 U
Aroclor-1232	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
Aroclor-1242	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
Aroclor-1248	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
Aroclor-1254	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
Aroclor-1260	1.0	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.1 U
DILUTION FACTOR:		1	1	1	1	1	1
SAMPLE VOLUME:		960	1000	1000	1000	1000	890
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/13/94	09/13/94	09/13/94	09/13/94	09/13/94	09/13/94
DATE EXTRACTED:		09/14/94	09/15/94	09/15/94	09/15/94	09/15/94	09/15/94
DATE ANALYZED:		09/15/94	09/22/94	09/22/94	09/22/94	09/22/94	09/22/94
REMARKS:		Duplicate of MW-5R	Duplicate of MW-5RF	Duplicate of MW-2R	Duplicate of MW-2RF		

Footnotes:

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U - Value is the sample detection limit.
R - Value is rejected.
UJ - Sample detection limit is approximate due to limitations identified in the quality control review.

Pesticide/PCB Aqueous Analysis
ug/L
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1197

M&E SAMPLE ID:		EB-1	EB-1F	EB-1(S)	EB-2(S)	FD-1	FB-2
Laboratory ID:		109686	109691	109561	109562	109580	109578
COMPOUND	CRQL						
alpha-BHC	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
beta-BHC	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
delta-BHC	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
gamma-BHC(Lindane)	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
Heptachlor	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
Aldrin	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
Heptachlor Epoxide	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
Endosulfan I	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
Dieldrin	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
4,4'-DDE	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Endrin	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Endosulfan II	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
4,4'-DDD	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Endosulfan Sulfate	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
4,4'-DDT	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Methoxychlor	0.50	0.50 U	0.56 U	0.57 U	0.53 U	0.54 U	0.57 U
Endrin Ketone	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Endrin Aldehyde	0.10	0.10 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
alpha-Chlordane	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
gamma-Chlordane	0.05	0.050 U	0.056 U	0.057 U	0.053 U	0.054 U	0.057 U
Toxaphene	5.0	5.0 U	5.6 U	5.7 U	5.3 U	5.4 U	5.7 U
Aroclor-1016	1.0	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Aroclor-1221	2.0	2.0 U	2.2 U	2.3 U	2.1 U	2.2 U	2.3 U
Aroclor-1232	1.0	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Aroclor-1242	1.0	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Aroclor-1248	1.0	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Aroclor-1254	1.0	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Aroclor-1260	1.0	1.0 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
DILUTION FACTOR:		1	1	1	1	1	1
SAMPLE VOLUME:		1000	890	880	950	920	880
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/13/94	09/07/94	09/07/94	09/07/94	09/07/94	09/07/94
DATE EXTRACTED:		09/15/94	09/12/94	09/13/94	09/13/94	09/13/94	09/13/94
DATE ANALYZED:		09/22/94	09/21/94	09/15/94	09/16/94	09/15/94	09/15/94
REMARKS:		Applies to unfiltered ground waters	Applies to filtered ground waters	Applies to soil samples	Applies to soil samples		

Footnotes:

CRQL - Contract Required Quantitation Limit.
J - Quantitation is approximate due to limitations identtified in the quality control review.
U - Value is the sample detection limit.
R - Value is rejected.
UJ - Sample detection limit is approximate due to limitations identified in the quality control review.

Pesticide/PCB Soil Analysis
ug/Kg
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1175,1197

M&E SAMPLE ID:		SB1-0-2-NX-201	SB1-2-4-NX-202	SB2-0-2-NX-203	SB2-2-4-NX-204	SB3-0-2-NX-205	SB3-2-4-NX-206
Laboratory ID:		109563	109564	109565	109566	109567	109579
COMPOUND	CRQL						
alpha-BHC	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
beta-BHC	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
delta-BHC	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
gamma-BHC(Lindane)	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Heptachlor	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Aldrin	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Heptachlor Epoxide	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Endosulfan I	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Dieldrin	3.3	31	3.9 U	85	1.4 J	3.7 U	4.1 U
4,4'-DDE	3.3	390	12	72 J	4.0 U	11	4.1 U
Endrin	3.3	7.3 U	3.9 U	3.6 U	4.0 U	3.7 U	4.1 U
Endosulfan II	3.3	7.3 U	3.9 U	3.6 U	4.0 U	3.7 U	4.1 U
4,4'-DDD	3.3	96 J	3.9 U	78 J	3.7 J	3.0 J	4.1 U
Endosulfan Sulfate	3.3	12 J	3.9 U	23 J	8.0 J	3.7 U	4.1 U
4,4'-DDT	3.3	3400	110	500	18	3.7 U	4.1 U
Methoxychlor	17.0	38 U	20 U	5.5 J	20 U	19 U	21 U
Endrin Ketone	3.3	7.3 U	3.9 U	3.6 U	4.0 U	3.7 U	4.1 U
Endrin Aldehyde	3.3	7.3 U	3.9 U	3.6 U	4.0 U	3.7 U	4.1 U
alpha-Chlordane	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
gamma-Chlordane	1.7	3.8 U	2.0 U	1.8 U	2.0 U	1.9 U	2.1 U
Toxaphene	170.0	380 U	200 U	180 U	200 U	190 U	210 U
Aroclor-1016	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1221	67.0	150 U	80 U	73 U	81 U	75 U	83 U
Aroclor-1232	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1242	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1248	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1254	33.0	73 U	39 U	36 U	40 U	37 U	41 U
Aroclor-1260	33.0	73 U	39 U	36 U	40 U	37 U	41 U
DILUTION FACTOR:		2/50/200	1/5	1/10	1	1	1
SAMPLE WEIGHT (g):		30	30	30	30	30	30
PERCENT SOLIDS:		90	84	92	83	89	81
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/07/94	09/07/94	09/07/94	09/07/94	09/07/94	09/07/94
DATE EXTRACTED:		09/12/94	09/12/94	09/12/94	09/12/94	09/12/94	09/12/94
DATE ANALYZED:		09/20/94	09/16/94	09/16/94	09/16/94	09/16/94	09/17/94
REMARKS:		Duplicate of SB-1-0-2-FD1-215					

Footnotes:

- CRQL - Contract Required Quantitation Limit.
- J - Quantitation is approximate due to limitations identtified in the quality control review.
- U - Value is the sample detection limit.
- R - Value is rejected.
- UJ - Sample detection limit is approximate due to limitations identified in the quality control review

Pesticide/PCB Soil Analysis
ug/Kg
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1175,1197

M&E SAMPLE ID:		SB4-0-2-NX-207	SB4-2-4-NX-208	SB5-0-2-NX-209	SB5-2-4-NX-210	SB6-0-2-NX-211	SB6-2-4-NX-212
Laboratory ID:		109568	109569	109570	109571	109572	109573
COMPOUND	CRQL						
alpha-BHC	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
beta-BHC	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
delta-BHC	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
gamma-BHC(Lindane)	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
Heptachlor	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
Aldrin	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
Heptachlor Epoxide	1.7	2.0 U	2.0 U	2.1 U	2.2 U	8.4 J	2.3 U
Endosulfan I	1.7	2.0 U	2.0 U	2.1 U	2.2 U	2.0 U	2.3 U
Dieldrin	3.3	3.8 U	3.9 U	3.1 J	4.2 U	13	4.5 U
4,4'-DDE	3.3	74	2.6 J	120	4.2 U	98	4.5 U
Endrin	3.3	3.8 U	3.9 U	4.1 U	4.2 U	3.9 U	4.5 U
Endosulfan II	3.3	3.8 U	3.9 U	4.1 U	4.2 U	3.9 U	4.5 U
4,4'-DDD	3.3	32 J	3.0 J	15 J	4.2 U	4.5 J	4.5 U
Endosulfan Sulfate	3.3	6.0 J	3.9 U	5.0 J	4.2 U	3.9 U	4.5 U
4,4'-DDT	3.3	160	8.9	52	4.2 U	77	4.5 U
Methoxychlor	17.0	20 U	20 U	21 U	22 U	20 U	23 U
Endrin Ketone	3.3	3.8 U	3.9 U	4.1 U	4.2 U	3.9 U	4.5 U
Endrin Aldehyde	3.3	3.8 U	3.9 U	4.1 U	4.2 U	3.9 U	4.5 U
alpha-Chlordane	1.7	2.0 U	2.0 U	6.5 J	2.2 U	5.6 J	2.3 U
gamma-Chlordane	1.7	2.0 U	2.0 U	3.1 J	2.2 U	1.5 J	2.3 U
Toxaphene	170.0	200 U	200 U	210 U	220 U	200 U	230 U
Aroclor-1016	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1221	67.0	77 U	80 U	83 U	85 U	79 U	91 U
Aroclor-1232	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1242	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1248	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1254	33.0	38 U	39 U	41 U	42 U	39 U	45 U
Aroclor-1260	33.0	38 U	39 U	41 U	42 U	39 U	45 U
DILUTION FACTOR:		1/10	1	1/5	1	1/2	1
SAMPLE WEIGHT (g):		30	30	30	30	30	30
PERCENT SOLIDS:		87	84	81	79	85	74
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/07/94	09/07/94	09/07/94	09/07/94	09/07/94	09/07/94
DATE EXTRACTED:		09/12/94	09/12/94	09/12/94	09/12/94	09/12/94	09/12/94
DATE ANALYZED:		09/16/94	09/16/94	09/16/94	09/16/94	09/16/94	09/16/94
REMARKS:							Duplicate of SB-2-4-FD2-216

Footnotes:

CRQL - Contract Required Quantitation Limit.
J - Quantitation is approximate due to limitations identtified in the quality control review.
U - Value is the sample detection limit.
R - Value is rejected.
UJ - Sample detection limit is approximate due to limitations identified in the quality control review.

Pesticide/PCB Soil Analysis
ug/Kg
(OLM01.8 SOW)

SITE: HANCOCK AIRFIELD
FD CASE NOS.: 1175,1197

M&E SAMPLE ID:		SB7-0-2-NX-213	SB7-2-4-NX-214	SB-1-0-2-FD1-215	SB-2-4-FD2-216	WB-3R-09-08-NX-221	WB-1R-09-08-NX-222
Laboratory ID:		109574	109575	109576	109577	109580	109578
COMPOUND	CRQL						
alpha-BHC	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
beta-BHC	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
delta-BHC	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
gamma-BHC(Lindane)	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Heptachlor	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Aldrin	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.1 U
Heptachlor Epoxide	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Endosulfan I	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Dieldrin	3.3	140	4.3 U	36 J	4.1 U	4.3 U	8.5 U
4,4'-DDE	3.3	350	4.3 U	500	4.1 U	150	17
Endrin	3.3	3.6 U	4.3 U	37 U	4.1 U	4.3 U	8.5 U
Endosulfan II	3.3	3.6 U	4.3 U	37 U	4.1 U	4.3 U	8.5 U
4,4'-DDD	3.3	830 J	5.2 J	110 J	4.1 U	160 J	3.1 J
Endosulfan Sulfate	3.3	130 J	4.3 U	37 U	4.1 U	4.3 U	8.5 U
4,4'-DDT	3.3	920	7.7	4600	4.1 U	2600	64
Methoxychlor	17.0	19 U	22 U	190 U	21 U	22 U	44 U
Endrin Ketone	3.3	3.6 U	4.3 U	37 U	4.1 U	4.3 U	8.5 U
Endrin Aldehyde	3.3	3.6 U	4.3 U	37 U	4.1 U	4.3 U	8.5 U
alpha-Chlordane	1.7	5.6 J	2.2 U	19 U	2.1 U	2.7 J	4.4 U
gamma-Chlordane	1.7	1.9 U	2.2 U	19 U	2.1 U	2.2 U	4.4 U
Toxaphene	170.0	190 U	220 U	1900 U	210 U	220 U	440 U
Aroclor-1016	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1221	67.0	74 U	88 U	750 U	84 U	88 U	170 U
Aroclor-1232	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1242	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1248	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1254	33.0	36 U	43 U	370 U	41 U	43 U	85 U
Aroclor-1260	33.0	36 U	43 U	370 U	41 U	43 U	84.6 U
DILUTION FACTOR:		1/25	1	10/100	1	1	2
SAMPLE WEIGHT (g):		30	30	30	30	30	30
PERCENT SOLIDS:		91	76	09	80	76	78
LEVEL:		LOW	LOW	LOW	LOW	LOW	LOW
DATE SAMPLED:		09/07/94	09/07/94	09/07/94	09/07/94	09/08/94	09/08/94
DATE EXTRACTED:		09/12/94	09/12/94	09/12/94	09/12/94	09/12/94	09/12/94
DATE ANALYZED:		09/16/94	09/21/94	09/21/94	09/17/94	09/17/94	09/21/94
REMARKS:				Duplicate of SB1-0-2-NX-201	Duplicate of SB6-2-4-NX-212		

Footnotes:
- CRQL - Contract Required Quantitation Limit.
- J - Quantitation is approximate due to limitations identtified in the quality control review.
- U - Value is the sample detection limit.
- R - Value is rejected.
- UJ - Sample detection limit is approximate due to limitations identified in the quality control review.

DATA VALIDATION WORKSHEETS

Metcalf & Eddy
Data Review Worksheet

Site Name: Hancock NYANG
Project Number: 014541-0001-003
Project Description: SI Confirmatory Study
Comments: Pesticide Storage Area

LEVEL C EVALUATION OF PESTICIDE/PCB CONTRACT LABORATORY DATA PACKAGE

The hard-copied (laboratory name) NET Cambridge data package received at Metcalf & Eddy has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No.	1175	SAS No.		Sampling Date(s)	09/07-08/94
NET Job ~~SDG~~ No.	94.02822	Matrix	16 Soil/4 Aq QC	Shipping Date(s)	09/08/94
No. of Samples	20			Date Rec'd by Lab	09/09/94

Traffic Report Nos.: NETIDS 109559 through 109578

Trip Blank No.: Not Applicable
Equipment Blank No.: 109561, 109562
Field Dup Nos.: 109563/109576 and 109573/109577

The general criteria used to determine the performance were based on an examination of:

- Holding Times
- Blanks
- Surrogate Recoveries and Retention Times
- Matrix Spike/Matrix Spike Duplicates
- Field Duplicates
- Florisil Cartridge Spike Recoveries
- Calibrations
- Resolution

Overall comments All holding times, blanks, MS/MSD recoveries and precision, pesticide resolution, surrogate retention times and florisil cartridge recoveries were within QC limits. Some surrogate recoveries were outside QC limits but the data were not impacted. There were some minor problems with pp-DDT in the performance evaluation mixtures but the data were not adversely impacted. Overall this was a very good quality data package

Definitions and Qualifiers:

A - Acceptable data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Compound not detected

Reviewer: Bruce E. Tiington Date: 10/11/94

Laboratory qualifiers already present on the data should be retained. Some values are reported estimated (J) due to quantitation below the detection limit. Values qualified P should be changed to (J) estimated due to >25% D across the two column quantitations. Where multiple quantitations (dilutions) are reported the appropriate dilution will be selected for quantitative results

Metcalf & Eddy
Data Review Worksheet

All Holding Time Criteria were met.

A. SAMPLE HOLDING TIMES

Sample ID	Date Sample Collected	Date Sample Extracted	Date Sample Analyzed	Comments
109559	9/7/94	9/13/94	9/15/94	Holding Times Met
109560				
109561			9/16/94	
109562		9/12/94		
109563			9/20/94	
109564			9/16/94	
109565				
109566				
109567				
109568				
109569				
109570				
109571				
109572				
109573				
109574			9/21/94	
109575				
109576			9/17/94	
109577				
109578	9/8/94		9/21/94	

QC Criteria: All samples should be extracted within 7 days of sample collection, and analyzed within 40 days of extraction.

Action: If holding times are exceeded, all positive results are estimated (J) and non-detects are estimated (UJ). If holding times are grossly exceeded, the reviewer may reject non-detects as unusable(R).

Metcalf & Eddy
Data Review Worksheet

All Blank Criteria were met.

B-1. BLANK ANALYSIS RESULTS (Sections 1 & 2)

List the contamination in the blanks below.

1. Laboratory Blanks

Level: Low

Date	Sample ID	Matrix	Compound	Concentration/ Units
9/16/94	PBLK109125K	Soil	All Pest/PCBs Not Detected	—
9/15/94	PBLK109135AK	Water	↓	—

Some of the instrument blanks have peaks but it is carryover from high concentration samples and is not representative of blank contamination

2. Equipment, Method, and Field Blanks

	Date	Sample ID	Matrix	Compound	Concentration/ Units
FB1	9/15/94	109559	Water	Pesticide/PCB-free	—
FB2	↓	109560	↓	↓	
EB1	↓	109561	↓	↓	
EB2	9/16/94	109562	↓	↓	

A separate worksheet would be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheets

All Blank Criteria were met.

B-2. BLANK ANALYSIS RESULTS (Section 3)

3. Blank Actions

Action levels should be based upon the highest concentration of contaminant determined in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the compound in the sample exceeds the action level of 5 times the amount in the blank for any compound. Specific actions are as follows:

1. If the concentration is less than or equal to the quantitation limit, report the CRQL and flag as non-detected (U).

2. If the concentration is greater than the CRQL, but less than the action level, report the concentration found and flag as non-detected (U).

3. If the concentration is greater than the action level, report the concentration unqualified.

LEVEL: Low

Compound	Max. Conc./Units	Action Level/Units	CRQL
No Blank contaminants detected.			

A separate worksheet should be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheet

C. Surrogate Spike Recoveries

List the surrogate recoveries which do not meet the criteria for surrogate recovery.

Matrix: Soil/Aqueous QC

Sample ID	Surrogate Recovery % TCX Col1	TCX Col2	DCB Col1	DCB Col2	Comments
109560			58.1	56.2	QC Samples No Qualification Required
109561			23.6	20.6	↓
109562			27.5	28.1	↓
109564 DL	12.7	12.5	15.8	14.8	Good Recovery in undiluted analysis.
109565 DL			159.4		Good Recovery in undiluted analysis.
109570	0				Coeluting interfering peak
109570 DL	0				↓
109572	0				↓
109572 DL	0				↓
109574 DL	0			183.8	Good Recovery in undiluted analysis.
109570 MS	0				Coeluting interfering peak
109570 MSD	0				↓
QC Limits:	60 to 150	60 to 150	60 to 150	60 to 150	

TCX = Tetrachloro-m-xylene
DCB = Decachlorobiphenyl

QC Limits are advisory only and qualification of data is left to professional judgement.

The zero TCX recovery on column 1 (XTI5) is not "zero" but cannot be assessed due to a coeluting interfering peak. Professional judgement is that no validation action is required regarding surrogate recoveries.

Metcalf & Eddy
Data Review Worksheets

All MS/MSD Criteria were met.

D. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND PRECISION

Sample Nos. 109570MS, 109570MSD Matrix: Soil

List the percent recoveries and RPDs of compounds which do not meet the QC criteria.

MS or MSD	Compound	%REC/ RPD	QC Limits
All Recoveries/RPDs within QC limits.			

QUALIFICATION IS LIMITED TO THE UNSPIKED SAMPLE ONLY.

1. If any compound does not meet the Contract Required Recovery range (CRR) as stated in the Validation Guidelines, follow the actions stated below:

	% Recovery		
	<10%	10% to lower CRR	>higher CRR
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

2. If any compound does not meet the RPD criteria as stated in the Validation Guidelines, flag positive results for that compound in the associated unspiked sample as estimated (J).

A separate worksheet should be used for each MS/MSD pair.

All field duplicate criteria were met.

Metcalf & Eddy
Data Review Worksheets

E. FIELD DUPLICATES

Sample Nos. 109563, 109576 / 109573/109577 Matrix: Soil

List the concentrations of the compounds which do not meet the following RPD criteria:

1. An RPD of <30% for water duplicates.
2. An RPD of <50% for soil duplicates.

	COMPOUND	SAMPLE CONC	DUP SAMPLE CONC	RPD
109563/ 109576	pp-DDE	390	420	7.4%
	Dieldrin	31	36	14.9%
	pp'-DDD	96	110	13.6%
	Endosulfan Sulfate	12	37 U	/
	pp'-DDT	3400	4600	30.0%
	109573/109577	All Compounds ND		

ACTIONS:

1. If the results for any compounds do not meet the RPD criteria, flag the positive results for that compound as estimated (J).

2. If one value is non-detected, and one is above the CRQL:

   a. Flag the positive result as estimated (J).
   b. Flag the non-detected result as estimated (UJ).

NOTE: Professional judgement may be utilized to apply duplicate actions to all samples of a similar matrix.

A separate worksheet should be filled out for each field duplicate pair.

All initial calibration criteria were met.

PESTICIDE INITIAL CALIBRATION FOR SINGLE COMPONENT ANALYTES (CLP FORM 6E)

List the single peak pesticide compounds that exceed 20% RSD or the surrogate compounds that exceed 30% RSD for the three point initial calibration.

Initial Calibration Date	Instrument ID	Compound	%RSD
8/23-8/24/94	GC7F	All initial cal criteria met both columns	

1). Did more than two target pesticides have RSDs greater than 20%? Yes or (No)

2). Did any target pesticide or surrogate have an RSD greater than 30%? Yes or (No)

If yes to 1 or 2, state the validation actions taken below:

✓

PESTICIDE RESOLUTION CHECK
(CLP FORM 6G)

List the resolution between adjacent single peak pesticides in the resolution check mix that are less than 60.0% on either chromatographic column.

Analysis Date	Column	Compound	%Resolution
8/23/94	XT15, RTX35	All Resolution Compounds Resolved Adequately	

PESTICIDE CALIBRATION VERIFICATION
(CONTINUING CALIBRATION CLP FORMS 7D,7E)

List the percent difference for the pesticide compounds that exceed 25%. List the percent breakdown for 4,4'-DDT or Endrin that exceed 20.0% or the combined breakdown of these two compounds that exceed 30.0%.

Analysis Date	Compound	Column	%D/Breakdown
9/3/94	4,4'-DDT	XT15	27%D ①
9/20/94	4,4'-DDT	XT15	27%D
9/23/94	4,4'-DDT	XT15	33%D

① These 4,4'-DDT percent D's are from the performance evaluation mix (PEM) analysis which is primarily for pesticide breakdown monitoring. Because they only slightly exceed 25%D and the individual mix A %D's are OK professional judgement is that no qualification of the DDT results is necessary.

PESTICIDE SURROGATE RETENTION TIME CHECK
(CLP FORM 8D)

All surrogates w/in windows, calibration sequence criteria met.

List the sample or standard in which one or both surrogates eluted outside their retention time window(s).

Analysis Date	Column	Sample or Standard	Surrogate Compound	RT Window	Surrogate RT
All surrogates within RT windows on both columns except where diluted out or when not spiked in lab QC samples					

For affected samples, professional judgement should be used to determine if retention times are shifted early or late causing target pesticides to elute outside their established retention time windows.

PESTICIDE/PCB INITIAL CALIBRATION SEQUENCE

Was the initial calibration sequence followed as outlined in Part 6 Section III of the SOW? (Yes) or No

PESTICIDE FLORISIL CARTRIDGE SPIKE RECOVERIES
(CLP FORM 9A)

List the florisil cartridge spike pesticides that were recovered outside the QC limits of 80-120 percent recovery.

Date	Pesticide	% Recovery
All florisil recoveries within QC limits.		

List the actions taken as a result of poor florisil cartridge spike recovery:

None Required

NATIONAL ENVIRONMENTAL TESTING, INC.®

Cambricge Division
12 Oak Park
Bedford MA 01730
Tel: (617) 275-3535
Fax: (617) 275-7411

October 7, 1994

Ms. Constance Lapite
Metcalf & Eddy, Inc.
30 Harvard Mill Square
Wakefield, MA 01888

RE: Hancock Air National Guard

Dear Ms. Constance Lapite:

Enclosed please find the results of the chemical analyses performed by NET Cambridge Division for the Hancock Air National Guard project (FD Case 1175, NET job number 94.02822).

This narrative addresses all comments for all samples as listed below:

NET JOB NUMBER: 94.02822

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
FLDQC-FB1-09-07-QC-219	109559	09/07/1994	17:10	09/09/1994	GROUND WATER
FLDQC-FB2-09-07-QC-220	109560	09/07/1994	17:15	09/09/1994	GROUND WATER
FLDQC-EB1-09-07-QC-217	109561	09/07/1994	14:00	09/09/1994	GROUND WATER
FLDQC-EB2-09-07-QC-218	109562	09/07/1994	16:05	09/09/1994	GROUND WATER
SB1-0-2-NX-201	109563	09/07/1994	14:50	09/09/1994	SOIL
SB1-2-4-NX-202	109564	09/07/1994	11:45	09/09/1994	SOIL
SB2-0-2-NX-203	109565	09/07/1994	14:30	09/09/1994	SOIL
SB2-2-4-NX-204	109566	09/07/1994	14:35	09/09/1994	SOIL
SB3-0-2-NX-205	109567	09/07/1994	17:05	09/09/1994	SOIL
SB4-0-2-NX-207	109568	09/07/1994	14:20	09/09/1994	SOIL
SB4-2-4-NX-208	109569	09/07/1994	14:20	09/09/1994	SOIL
SB5-0-2-NX-209 +MS/MSD	109570	09/07/1994	15:15	09/09/1994	SOIL
SB5-2-4-NX-210	109571	09/07/1994	15:15	09/09/1994	SOIL
SB6-0-2-NX-211	109572	09/07/1994	16:15	09/09/1994	SOIL
SB6-2-4-NX-212	109573	09/07/1994	16:20	09/09/1994	SOIL
SB7-0-2-NX-213	109574	09/07/1994	16:45	09/09/1994	SOIL
SB7-2-4-NX-214	109575	09/07/1994	16:55	09/09/1994	SOIL
SB-1-0-2-FD1-215	109576	09/07/1994	14:50	09/09/1994	SOIL
SB-2-4-FD2-216	109577	09/07/1994	16:20	09/09/1994	SOIL
WB-1R-09-08-NX-222	109578	09/08/1994	10:36	09/09/1994	SOIL

OCEAN GROUP

Metcalf & Eddy
Data Review Worksheet

Site Name: Hancock NYANG
Project Number: 014541-0001-003
Project Description: SI Confirmatory Study
Comments: Pesticide Storage Area

LEVEL C EVALUATION OF PESTICIDE/PCB CONTRACT LABORATORY DATA PACKAGE

The hard-copied (laboratory name) NET Cambridge data package received at Metcalf & Eddy has been reviewed and the quality assurance and performance data summarized. The data review included:

Case No.	1197	SAS No.		Sampling Date(s)	09/7,8,12,13/94
SDG No.		Matrix	Soil/Groundwater	Shipping Date(s)	
No. of Samples	2 Soil + 14 GW = 16			Date Rec'd by Lab	09/9, 13, 14/94

Traffic Report Nos.: NET IDs 109579, 109580, 109629 - 109634, 109686-109693

Trip Blank No.: Not Applicable
Equipment Blank No.:
Field Dup Nos.: 109689/109690 and 109692/109693

The general criteria used to determine the performance were based on an examination of:

- Holding Times
- Blanks
- Surrogate Recoveries and Retention Times
- Matrix Spike/Matrix Spike Duplicates
- Field Duplicates
- Florisil Cartridge Spike Recoveries
- Calibrations
- Resolution

Overall comments All holding times, blanks, MS/MSD, field duplicates, florisil recoveries and pesticide resolution checks were within QC limits. Some surrogate recoveries were slightly low but the data were not adversely impacted. A few performance evaluation mix pp-DDT %Ds were out but the individual mix standards were within QC limits. Overall this was a very good data package

Definitions and Qualifiers:

A - Acceptable data
J - Approximate data due to quality control criteria
R - Reject data due to quality control criteria
U - Compound not detected

Reviewer: Bruce E. Tingstrom Date: 10/12/94

1

Existing lab qualifiers will be retained on the data. Some values are J (estimated) due to quantitation below the sample detection limit and P values should be changed to J for quantitations with >25% difference across the two columns. Where multiple quantitations (dilutions) are reported the appropriate dilution will be selected.

Metcalf & Eddy
Data Review Worksheet

All Holding Time criteria were met.

A. SAMPLE HOLDING TIMES

Sample ID	Date Sample Collected	Date Sample Extracted	Date Sample Analyzed	Comments
109579	9/7/94	9/12/94	9/17/94	All within HT
109580	9/8/94	↓	↓	
109629	9/12/94	9/13/94	9/21/94	
109630				
109631			↓	
109632			9/22/94	
109633				
109634	↓	↓		
109686	9/13/94	9/15/94		
109687				
109688				
109689				
109690				
109691				
109692				
109693	↓	↓	↓	↓

QC Criteria: All samples should be extracted within 7 days of sample collection, and analyzed within 40 days of extraction.

Action: If holding times are exceeded, all positive results are estimated (J) and non-detects are estimated (UJ). If holding times are grossly exceeded, the reviewer may reject non-detects as unusable(R).

Metcalf & Eddy
Data Review Worksheet

All Blank Criteria were met.

B-1. BLANK ANALYSIS RESULTS (Sections 1 & 2)

List the contamination in the blanks below.

1. Laboratory Blanks

Level: Low

Date	Sample ID	Matrix	Compound	Concentration/ Units
Lab method blanks and instrument blanks pesticide/PCB-free. Some instrument blanks have peaks but these are the result of carryover and are not representative of blank contamination.				

2. Equipment, Method, and Field Blanks

Date	Sample ID	Matrix	Compound	Concentration/ Units
The filtered and unfiltered equipment blanks are pesticide/PCB-free.				

A separate worksheet would be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheets

All Blank Criteria were met.

B-2. BLANK ANALYSIS RESULTS (Section 3)

3. Blank Actions

Action levels should be based upon the highest concentration of contaminant determined in any blank. The action level for samples which have been concentrated or diluted should be multiplied by the concentration/dilution factor. No positive sample result should be reported unless the concentration of the compound in the sample exceeds the action level of 5 times the amount in the blank for any compound. Specific actions are as follows:

1. If the concentration is less than or equal to the quantitation limit, report the CRQL and flag as non-detected (U).

2. If the concentration is greater than the CRQL, but less than the action level, report the concentration found and flag as non-detected (U).

3. If the concentration is greater than the action level, report the concentration unqualified.

LEVEL: Low

Compound	Max. Conc./Units	Action Level/Units	CRQL
No Blank contaminants detected.			

A separate worksheet should be used for low and medium level blanks.

Metcalf & Eddy
Data Review Worksheet

C. Surrogate Spike Recoveries

List the surrogate recoveries which do not meet the criteria for surrogate recovery.

Matrix: GW / Soil

Sample ID	Surrogate Recovery %				Comments
	TCXCol1	TCXCol2	DCBCol1	DCBCol2	
PBLK101915AK	58.0	58.9			
109686			46.6	44.6	
109629			35.8	33.4	
109630			48.2	46.1	
109631			46.3	43.0	
109689			33.7	31.8	
109690			32.8	30.9	
109693	58.4				
109629MS			32.5	32.7	
109629MSD			38.0	36.1	
109691			40.0	38.0	

QC Limits:

60 to 150	60 to 150	60 to 150	60 to 150

TCX = Tetrachlorometaxylene
DCB = Decachlorobiphenyl

QC Limits are advisory only and qualification of data is left to professional judgement.

Five of the unfiltered samples have DCB recovery below QC limits but the filtered recoveries are good indicating a possible matrix effect. Because the DCB surrogate is reasonable, the TCX recovery is good and the matrix spike recoveries are good professional judgement is that no qualification of the data is necessary regarding surrogate recovery.

All MS/MSD criteria were met.

Metcalf & Eddy
Data Review Worksheets

D. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES AND PRECISION

Sample Nos. 109629MS, 109629MSD / 109632MS, 109632MSD(F) Matrix: Groundwater both filtered and unfiltered

List the percent recoveries and RPDs of compounds which do not meet the QC criteria.

MS or MSD	Compound	%REC/ RPD	QC Limits
All recoveries and RPDs were within QC limits for both the unfiltered MS/MSD and filtered MS/MSD.			

QUALIFICATION IS LIMITED TO THE UNSPIKED SAMPLE ONLY.

1. If any compound does not meet the Contract Required Recovery range (CRR) as stated in the Validation Guidelines, follow the actions stated below:

	% Recovery		
	<10%	10% to lower CRR	>higher CRR
Positive Sample Results	J	J	J
Non-detected Results	R	UJ	A

2. If any compound does not meet the RPD criteria as stated in the Validation Guidelines, flag positive results for that compound in the associated unspiked sample as estimated (J).

A separate worksheet should be used for each MS/MSD pair.

All field duplicate criteria were met.

Metcalf & Eddy
Data Review Worksheets

E. FIELD DUPLICATES

Sample Nos. 109689/109690 – Unfiltered
109692/109693 – Filtered

Matrix: Ground water

List the concentrations of the compounds which do not meet the following RPD criteria:

1. An RPD of <30% for water duplicates.
2. An RPD of <50% for soil duplicates.

COMPOUND	SAMPLE CONC	DUP SAMPLE CONC	RPD
Both the unfiltered field duplicates and filtered field duplicates were nondetected for all pesticides/PCBs and therefore were within QC criteria.			

ACTIONS:

1. If the results for any compounds do not meet the RPD criteria, flag the positive results for that compound as estimated (J).

2. If one value is non-detected, and one is above the CRQL:

   a. Flag the positive result as estimated (J).
   b. Flag the non-detected result as estimated (UJ).

NOTE: Professional judgement may be utilized to apply duplicate actions to all samples of a similar matrix.

A separate worksheet should be filled out for each field duplicate pair.

PESTICIDE INITIAL CALIBRATION FOR SINGLE COMPONENT ANALYTES (CLP FORM 6E)

List the single peak pesticide compounds that exceed 20% RSD or the surrogate compounds that exceed 30% RSD for the three point initial calibration.

Initial Calibration Date	Instrument ID	Compound	%RSD
8/23-24/94	6C7F	All initial calibration criteria met both columns.	

1). Did more than two target pesticides have RSDs greater than 20%? Yes or (No)

2). Did any target pesticide or surrogate have an RSD greater than 30%? Yes or (No)

If yes to 1 or 2, state the validation actions taken below:

✓

PESTICIDE RESOLUTION CHECK
(CLP FORM 6G)

List the resolution between adjacent single peak pesticides in the resolution check mix that are less than 60.0% on either chromatographic column.

Analysis Date	Column	Compound	%Resolution
8/23/94	All resolution pesticides sufficiently Resolved.		

PESTICIDE CALIBRATION VERIFICATION
(CONTINUING CALIBRATION CLP FORMS 7D,7E)

List the percent difference for the pesticide compounds that exceed 25%. List the percent breakdown for 4,4'-DDT or Endrin that exceed 20.0% or the combined breakdown of these two compounds that exceed 30.0%.

	Analysis Date	Compound	Column	%D/Breakdown
PEM12	9/3/94	pp'-DDT	XTI5	27%D
PEM21	9/20/94	pp'-DDT	XTI5	27%D
PEM22	9/21/94	pp'-DDT	XTI5	31%D
PEM26	9/23/94	pp'-DDT	XTI5	33%D

These values for pp'-DDT that exceed 25%D are from performance evaluation mixes designed primarily to check for breakdown. Because only the XTI5 column has >25%D the individual mix standards were within %D limits and the exceeded %Ds were only slightly above 25% professional judgement is that no validation action is required.

PESTICIDE SURROGATE RETENTION TIME CHECK
(CLP FORM 8D)

All Surrogate RT, Calibration Sequence criteria were met.

List the sample or standard in which one or both surrogates eluted outside their retention time window(s).

Analysis Date	Column	Sample or Standard	Surrogate Compound	RT Window	Surrogate RT
All Surrogates diluted out or		within RT windows except where not present in lab QC samples			

For affected samples, professional judgement should be used to determine if retention times are shifted early or late causing target pesticides to elute outside their established retention time windows.

PESTICIDE/PCB INITIAL CALIBRATION SEQUENCE

Was the initial calibration sequence followed as outlined in Part 6 Section III of the SOW? (Yes) or No

PESTICIDE FLORISIL CARTRIDGE SPIKE RECOVERIES
(CLP FORM 9A)

The Florisil recovery criteria were met.

List the florisil cartridge spike pesticides that were recovered outside the QC limits of 80-120 percent recovery.

Date	Pesticide	% Recovery
12/11/93	All recoveries	w/in QC limits

List the actions taken as a result of poor florisil cartridge spike recovery:

✓

NET NATIONAL ENVIRONMENTAL TESTING, INC.

Cambridge Division
12 Oak Park
Bedford, MA 01730
Tel: (617) 275-3535
Fax: (617) 275-7411

October 7, 1994

Ms. Constance Lapite
Metcalf & Eddy, Inc.
30 Harvard Mill Square
Wakefield, MA 01888

RE: Hancock Air National Guard

Dear Ms. Constance Lapite:

Enclosed please find the results of the chemical analyses performed by NET Cambridge Division for the Hancock Air National Guard project (FD Case 1197, NET job numbers 94.02823, 94.02839, 94.02840, 94.02860 and 94.02861).

This narrative addresses all comments for all samples as listed below:

NET JOB NUMBER: 94.02823, 94.02839
94.02840, 94.02860, 94.02861

SAMPLE ID	NET ID	DATE TAKEN	TIME TAKEN	DATE REC'D	MATRIX
SB3-2-4-NX-206	109579	09/07/1994	17:15	09/09/1994	SOIL
WB-3R-09-08-NX-221	109580	09/08/1994	10:40	09/09/1994	SOIL
MW-1R +MS/MSD	109629	09/12/1994	11:15	09/13/1994	GROUND WATER
MW-3R	109630	09/12/1994	13:05	09/13/1994	GROUND WATER
MW-4R	109631	09/12/1994	16:00	09/13/1994	GROUND WATER
MW-1R +MS/MSD [DISS]	109632	09/12/1994	11:20	09/13/1994	GROUND WATER
MW-3R [DISS]	109633	09/12/1994	13:30	09/13/1994	GROUND WATER
MW-4R [DISS]	109634	09/12/1994	16:30	09/13/1994	GROUND WATER
EB-1	109686	09/13/1994	10:00	09/14/1994	GROUND WATER
AP-1	109687	09/13/1994	10:30	09/14/1994	GROUND WATER
IU-1	109688	09/13/1994	10:30	09/14/1994	GROUND WATER
MW-2R	109689	09/13/1994	11:30	09/14/1994	GROUND WATER
MW-5R	109690	09/13/1994	12:30	09/14/1994	GROUND WATER
EB-1F [DISS]	109691	09/13/1994	10:00	09/14/1994	GROUND WATER
MW-2R [DISS]	109692	09/13/1994	12:00	09/14/1994	GROUND WATER
MW-5R [DISS]	109693	09/13/1994	13:00	09/14/1994	GROUND WATER