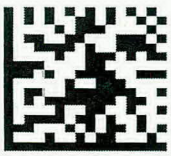

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Installation Restoration Program

TECHNICAL MEMORANDUM: PESTICIDE STORAGE AREA SITE 6

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

DRAFT FINAL

November 1995

Prepared For:
Air National Guard Readiness Center
Andrews Air Force Base, Maryland

Prepared by
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Environmental Management and Enrichment Facilities
Oak Ridge, Tennessee 37831-7606
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

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ACRONYMS AND ABBREVIATIONS

ASTM	American Society of Testing and Materials
bgs	below ground surface
BHC	benzene hexachloride
CLP	Contract Laboratory Program
DD	Decision Document
DDD	4,4'-dichlorodiphenyl dichloroethane
DDE	4,4'-dichlorodiphenyl dichloroethylene
DDT	4,4'-dichlorodiphenyl trichloroethane
EPA	Environmental Protection Agency
FFS	Focused Feasibility Study
HAZWRAP	Hazardous Waste Remedial Actions Program
IRP	Installation Restoration Program
µg/l	microgram/liter
µg/kg	microgram/kilogram
NYSDEC	New York State Department of Environmental Conservation
POL	petroleum, oils, lubricants facility
SB	soil boring
SI	Site Investigation

1. INTRODUCTION

1.1 BACKGROUND

The Department of Defense (DOD) Installation Restoration Program (IRP) is responsible for identification, evaluation, and remediation of sites where past activities may threaten public health, public welfare, or the environment. The Air National Guard Readiness Center (ANGRC) has the responsibility of managing the DOD IRP for Air National Guard Facilities. Through an interagency agreement, ANGRC requested that the Department of Energy (DOE) provide technical assistance in implementing IRP activities. DOE has assigned responsibility for providing this technical assistance to the Hazardous Waste Remedial Actions Program (HAZWRAP) managed for DOE by Lockheed Martin Energy Systems, Inc. HAZWRAP was tasked with conducting this IRP investigation at the Pesticide Storage Area, IRP Site 6, at the 174th Fighter Wing, New York Air National Guard, Hancock Field, Syracuse, New York (hereafter called "the Base").

The IRP is similar to, and consistent with, the U.S. Environmental Protection Agency (EPA) Superfund program. Applicable legislation includes the Comprehensive Environmental Response, Compensation, and Liability Act; Superfund Amendment and Reauthorization Act; and Presidential Executive Order 12580 (January 23, 1987). The IRP involves the identification of former waste disposal sites at DOD installations. If contamination is identified, an evaluation of the extent of contamination is completed and remedial action is implemented (if necessary). The IRP emphasizes cooperation with state environmental regulatory agencies and public involvement through community relations planning.

1.2 SITE DESCRIPTION

This IRP investigation was conducted at the Pesticide Storage Area, Site 6. Site 6 is located in an area separate from the current boundaries of the Air National Guard Base (Fig. 1). The site lies immediately adjacent to the location of the former entomology shop, Building 259, and extends for approximately 100 ft to the southeast (Fig. 2). An area of military housing is located approximately 1000 ft to the east of the site, and another residential area is located 0.5 mile west of the Site.

Site 6, as originally defined (ES, 1982), was identified as the location of a 500-gallon underground concrete holding tank located near the former entomology shop. The tank was used from 1984 to 1985 to store rinse water from pesticide container and application equipment. The tank was suspected to have leaked into the surrounding soil and groundwater (SAIC, 1986). According to Base personnel, the tank was subject to infiltration in wet weather and drained during dry weather (Radian, 1994). The tank was removed in November 1989 (Radian, 1994).

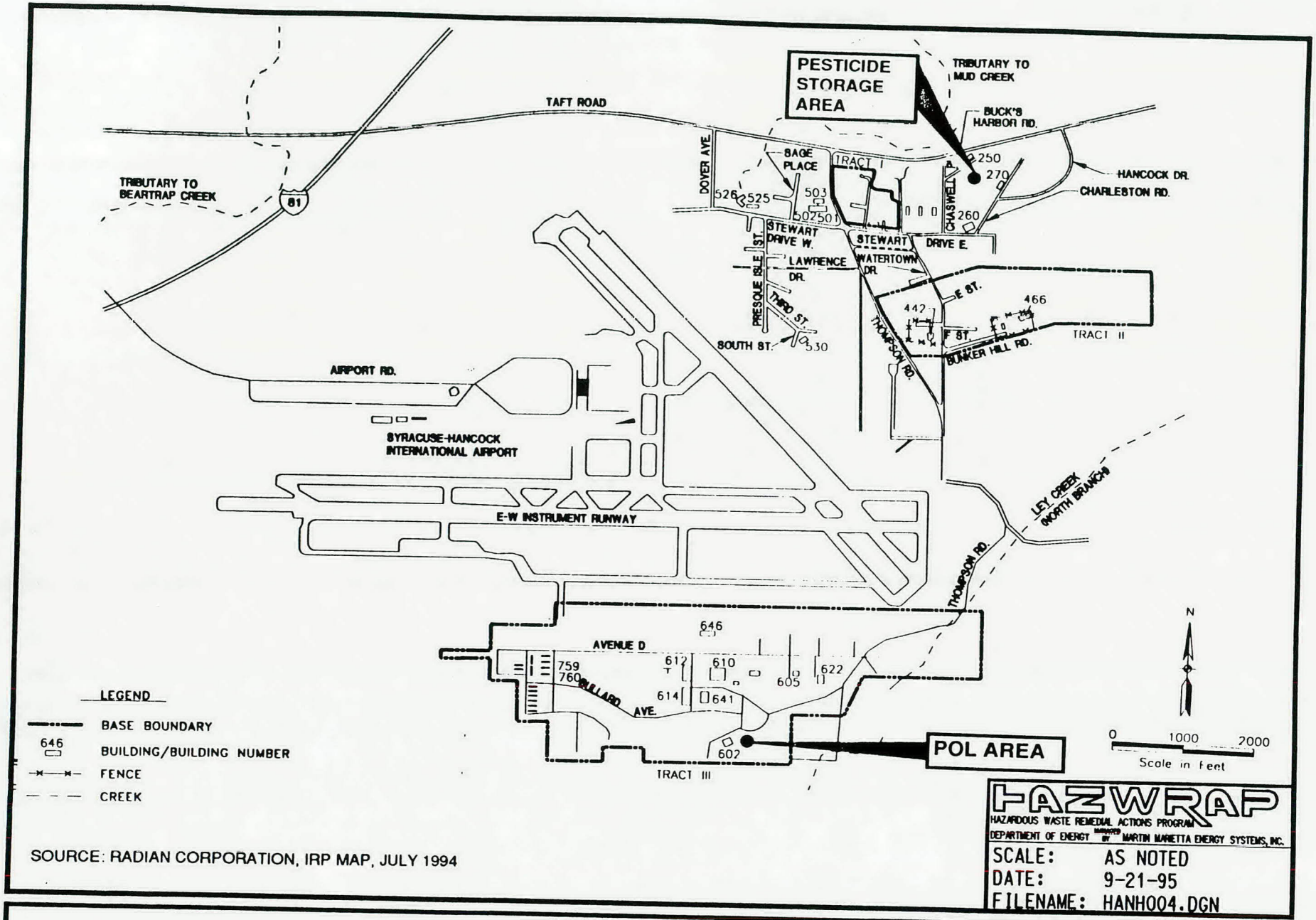

Fig. 1. Location of Pesticide Storage Area, New York ANG, Hancock Field, Syracuse, New York.

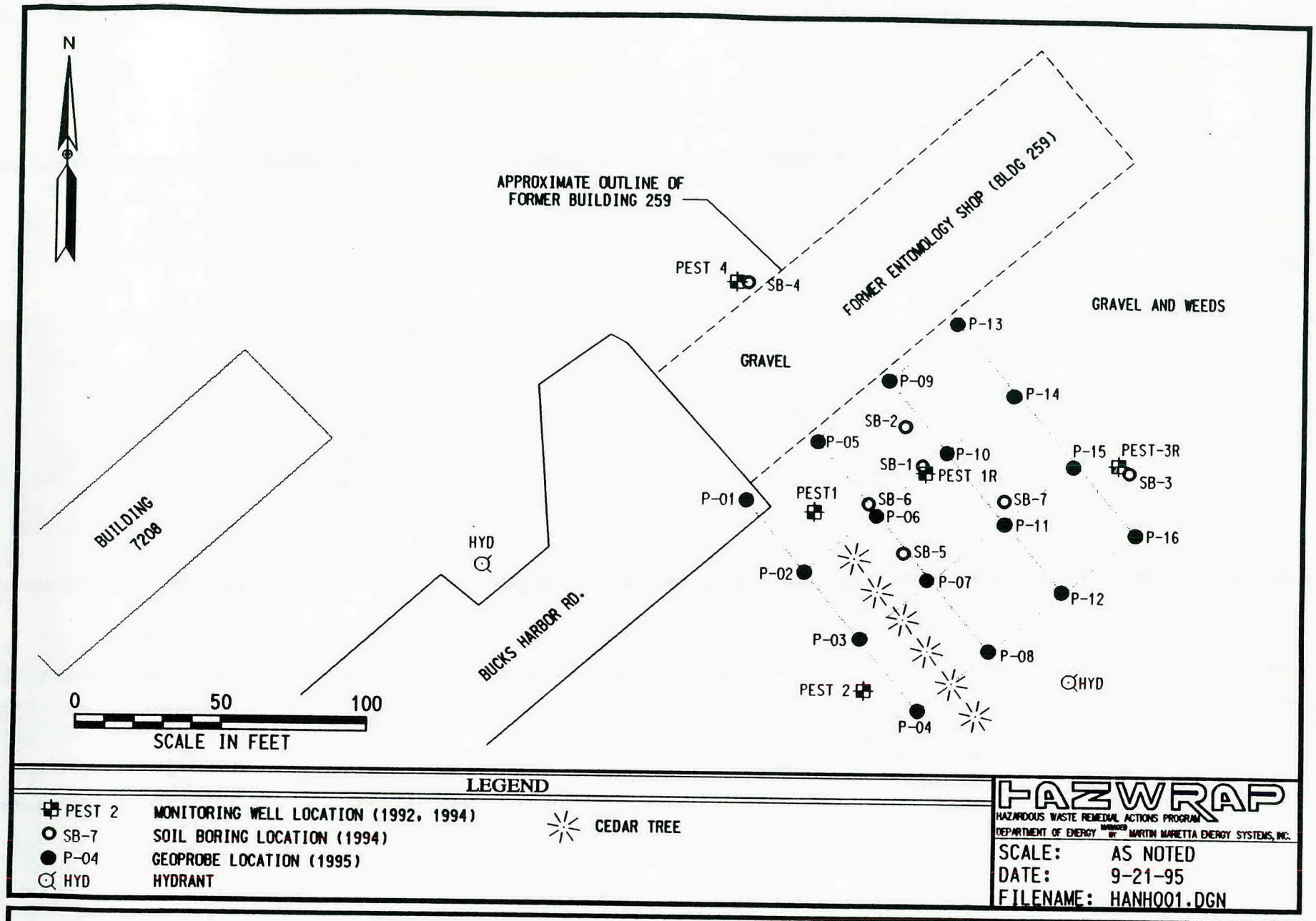

Fig. 2. Pesticide Storage Area. Monitoring Well and Boring Locations. Hancock Field, Syracuse, New York.

1.3 PURPOSE AND OBJECTIVE

This document summarizes field activities and analytical results obtained from a soil sampling investigation conducted in August 1995 at the Pesticide Storage Area. The purpose of the investigation was to evaluate:

- the lateral distribution of soil containing pesticide contamination and
- the vertical distribution of soil containing pesticide contamination.

The investigation and data presented provide the ANGRC with a recommendation for further action at the Site.

1.4 PREVIOUS INVESTIGATION ACTIVITIES

1.4.1 Phase II Investigation (1986)

Site 6 was identified in the July 1982 Phase I Records Search (ES, 1982). As part of the subsequent Phase II Stage 2 investigation in 1986, water in the concrete holding tank was sampled and a shallow (0 to 3 ft) hand-augered soil boring advanced and sampled 20 ft down-slope to the southeast. Both water and soil samples were analyzed for organochlorine pesticides and herbicides and organophosphorus pesticides. Malathion was measured in the tank contents at 48 μg/l, above the New York State Class GA Groundwater Standard of 7 μg/l; no other pesticides were detected in the tank. Four organochlorine insecticides were detected at concentrations considered not to pose a threat to human health or the environment in the down-slope shallow soil sample location (SAIC, 1986). The levels found were below current day New York State Department of Environmental Conservation (NYSDEC) soil cleanup objectives. The highest concentrations were found at the shallowest depth (0-6 in.). No further action was recommended for the Site (M&E, 1992). However, by letter dated June 6, 1990, NYSDEC requested additional groundwater investigation.

1.4.2 Site Investigation (1990)

A Site Investigation (SI) was conducted in November 1990. Three composite soil samples (0 to 16 ft bgs) were collected from the three soil borings advanced to install monitoring wells. Three monitoring wells were installed and unfiltered groundwater samples collected. Both soil and groundwater samples were analyzed by EPA methods SW 8080, 8140, and 8150. 4,4'-dichlorodiphenyl trichloroethane (DDT) and its metabolites 4,4'-dichlorodiphenyl dichloroethane (DDD) and 4,4'-dichlorodiphenyl dichloroethylene (DDE) were detected in the soil samples at maximum concentrations of 220 μg/kg, 17 μg/kg, and 13 μg/kg, respectively. The same three organochlorine insecticides were detected in the groundwater collected from one of the three monitoring wells (PEST-3R on Fig. 2) at concentrations of 6.2 μg/L, 0.35 μg/L and 43.9 μg/L, respectively (M&E, 1992a). The risk assessment concluded that these concentrations did not pose a threat to human health or environment, and a draft decision document (DD) for no further action was completed in March 1992. The NYSDEC reviewed the draft DD and in a letter dated June 6, 1990, requested additional sampling and installation of an upgradient monitoring well.

1.4.3 Confirmatory Study (1994)

In September 1994, a confirmatory study was conducted. The field activities included installing and sampling an upgradient monitoring well, replacing two monitoring wells whose integrity had been compromised and sampling these and one existing monitoring well, and advancing seven additional borings (Fig. 2) and collecting soil samples from discrete sampling intervals. Pesticide contamination of the groundwater was not indicated by the sampling and analyses. Filtered and unfiltered groundwater samples were analyzed for pesticides by Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) methods and did not indicate contamination. Concentrations of 4,4'DDT, 4,4'DDD, and 4,4'DDE were detected in all seven borings from the shallow depth interval (0 to 2 ft) at maximum concentrations of 4600 µg/kg, 830J µg/kg, and 500 µg/kg, respectively. Other pesticides detected include heptachlor epoxide, dieldrin, endosulfan sulfate, methoxychlor, alpha chlorodane and gamma chlorodane (M&E, 1995). Concentrations exceeded NYSDEC Soil Cleanup Objectives for 4,4' DDT in one boring, SB-1, and dieldrin in two borings, SB-2 and SB-7. As in the 1986 sampling, concentrations were greater in the 0- to 2-ft interval than in the samples collected from the 2- to 4-ft depth.

2. FIELD PROGRAM

2.1 INVESTIGATIVE APPROACH

Prior to the August 1995 activity, investigations had focused on characterizing the extent of contamination related to the storage tank. This investigation evaluated the possibility that contamination may have been caused by random dumping (i.e., from overflow of a shallow tank or rinsing spray applicators).

The objective of this investigation was achieved using the following approach:

- A grid area, 100 ft by 100 ft, was established.
- Sixteen equally spaced grid locations were sampled.
- Two sample intervals were collected from each location (0–2 ft and 2–4 ft).
- Laboratory extractions were performed on all samples to meet holding times.
- All 0- to 2-ft samples were analyzed for pesticides.
- Based on the results of the 0- to 2-ft analysis, eight of the 2- to 4-ft samples were analyzed for pesticides.

2.2 TASK PROCEDURES

2.2.1 Soil Sampling

Surface (0–2 ft) and subsurface (2–4 ft) sampling was conducted at the Pesticide Storage Area using a Geoprobe large-bore sampler. The sampler is a 24-in. long x 1-3/8-in. diameter piston-type soil sampler. Clear plastic liners were used in the sampler during collection. The liners are capable of recovering a soil core of approximately 22 x 1-1/16 in. and hold a volume of up to 320 ml. The liners were cut open with a stainless steel knife and homogenized in a stainless steel mixing bowl with a stainless steel spoon. The homogenized sample was placed in a 4-ounce clear glass sampling jar and sealed with a teflon-lined lid and marked with the sample number, sample interval, sample date, etc. The marked jar was placed in a plastic bag and placed in a cooler with ice for shipment to the fixed-base laboratory.

2.2.2 Plugging and Abandonment

Soil sampling probe locations were plugged and abandoned by pouring granular bentonite through a funnel into the boring from total depth to surface.

2.3 DECONTAMINATION AND WASTE HANDLING

Decontamination procedures for all drilling and sampling activities followed DOE/HWP-100, Standard Operating Procedure 14. All tools coming in direct contact with the sample—including the sampler cutting shoe and piston tip, sample cutting knives, stainless-steel mixing bowls and spoons— were decontaminated before each use. Although detailed in DOE/HWP-100, the decontamination procedure was basically one of washing equipment with tap water and detergent (Alconox), rinsing with tap water, rinsing with ASTM Type II water, rinsing with methanol, and then allowing sampling equipment to air dry. Tools not used immediately were wrapped in aluminum foil or plastic sheets. Drilling equipment such as the piston rods, extension rods, and the sampler itself were steam cleaned between each sampling location.

All decontamination procedures performed during the field investigation were documented in the site logbook. Decontamination was performed at a decontamination area set up at the petroleum, oil, and lubricants facility (POL), Site 1. Decontamination fluids were containerized and subsequently analyzed by field Gas Chromatography. Because no contamination was detected, the fluids were poured onto the ground.

Because of the push-type technology of the Geoprobe equipment used, no soil cuttings were generated.

2.4 SURVEYING

The elevations and horizontal locations for all Geoprobe sample points were surveyed by a state registered surveyor. Elevations and locations of previously existing monitoring wells and soil borings from the 1994 field effort were also surveyed. The coordinates are provided in Appendix A.

3. LABORATORY ANALYSIS

All samples collected were submitted to PACE Environmental Laboratories, Maine, for analysis. Samples collected were analyzed for Pesticides using EPA CLP Method. Laboratory analyses were performed using HAZWRAP Level C Quality Control protocol following procedures outlined in DOE/HWP-65R1.

A total of 32 samples, including both the 0- to 2-ft interval and 2- to 4-ft interval, was extracted within the 14 days of sampling as required by the method. The 16 samples from the 0- to 2-ft interval were analyzed, and data were reported on CLP Form 1 to HAZWRAP. Based on the level of contamination found in these initial samples, eight additional samples from the 2- to 4-ft interval were selected for analyses.

Analytical data obtained from the investigation is summarized in Table 1. Individual sample numbers are referenced as follows: P0502 represents sample location P05 sampled from the 0 to 2 ft interval. In cases where a sample required dilution for analysis of a specific compound, only the diluted value is presented followed by the "D" qualifier. The complete laboratory results are included in Appendix B. Data has not been validated.

4. FIELD INVESTIGATION RESULTS

4.1 SITE CONTAMINANTS

Of the 16 samples analyzed for pesticide contamination from 0–2 ft, detections of contaminants were reported in 13 samples (Table 1). By far, the most common site contaminants consisted of 4,4' DDT and its metabolites, 4,4' DDD and 4,4' DDE. Other compounds detected were dieldrin, alpha and gamma chlorodane, heptachlor epoxide, beta and delta benzene hexachloride (BHC), enderin, endosulfan I and II, enderin ketone, and enderin aldehyde. Endosulfan sulfate and methoxychlor were not detected but were included on Table 1 because of NYSDEC soil cleanup objectives for these compounds.

4.2 COMPARISON TO NYSDEC SOIL CLEANUP OBJECTIVES

NYSDEC recommended soil cleanup objectives were exceeded in four (including one duplicate sample) of the 16 shallow soil samples from the 0- to 2-ft interval (Fig. 3). No detections of these compounds or any other pesticide compounds were found in the eight samples analyzed from the 2- to 4-ft interval. Cleanup objectives were exceeded for heptachlor epoxide, dieldrin, 4,4' DDT and 4,4' DDD. Specifically, sample number P0702 found heptachlor epoxide at a qualified value

Table 1. Pesticide Storage Area analytical results for soil Hancock Field, New York Air National Guard, Syracuse, New York

SAMPLE NUMBER: / DATE SAMPLED: / SAMPLE DEPTH (ft) / COMPOUND	CRQL(ug/kg)	NYDEC CLEANUP OBJECTIVE (ug/kg)	PO102 8/11/95 0-2	PO202 8/11/95 0-2	PO302 8/11/95 0-2	P0302D 8/11/95 0-2	P0324 8/11/95 2-4	P0402 8/11/95 0-2	P0424 8/11/95 2-4	P0502 8/11/95 0-2	P0602 8/11/95 0-2	P0602 8/11/95 0-2
beta BHC	1.7	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
delta BHC	1.7	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	2.2 P	N.D.	N.D.	N.D.	N.D.
Heptachlor Epoxide	1.7	20	N.D.	N.D.	7.0 P	N.D.	N.D.	13 P	N.D.	N.D.	N.D.	N.D.
Endosulfan I	1.7	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dieldrin	3.3	44	N.D.	N.D.	21 P	29	N.D.	30 P	N.D.	N.D.	10	10
4,4' DDE	3.3	2,100	3.5J	3.5J	440 D	N.D.	N.D.	380 D	N.D.	N.D.	N.D.	N.D.
Endrin	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	7.6 P	N.D.	N.D.	N.D.	N.D.
Endosulfan II	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
4,4' DDD	3.3	2,900	N.D.	N.D.	30 P	N.D.	N.D.	23 P	N.D.	N.D.	N.D.	N.D.
Endosulfan Sulfate	3.3	900	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
4,4' DDT	3.3	2,100	N.D.	2.2 JP	160 D	16	N.D.	340 D	N.D.	N.D.	5.4	5.4
Methoxychlor	17	10,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Endrin ketone	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Endrin aldehyde	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
alpha Chlorodane	1.7	540	N.D.	N.D.	10	N.D.	N.D.	19	N.D.	N.D.	N.D.	N.D.
gamma Chloradane	1.7	100	N.D.	N.D.	3.9	N.D.	N.D.	4.6	N.D.	N.D.	N.D.	N.D.
TOTAL PESTICIDES		10,000	0	6	672	45	0	819	0	0	15	15

Footnotes:

P0302D	Indicates duplicate sample for P0302
NYSDEC	New York State Department of Environmental Conservation
CRQL	Contract Required Quantitation Limit
24DP	Results exceed NYSDEC Soil Cleanup Objective (NYSDEC, !994)
N.D.	Compound was analyszed but not detected
J	Indicates and estimated value (result detected below the CRQL or one of the quality control criteria out of limits)
E	Concentration exceeds initial calibration range of instrument for that specific analyte
D	Sample has been diluted and re-analyzed; dilution factor is listed in the summary table
P	Greater than 25% difference exists between concentrations calculated from the 2 GC columns; lower of thwo values reported

Table 1. Pesticide Storage Area analytical results for soil Hancock Field,
New York Air National Guard, Syracuse, New York

SAMPLE NUMBER:		NYDEC	P0702	P0724	P0802	P0902	P0902D	P0924	P01002	P01002	P1124	P1102
DATE SAMPLED:		CLEANUP	8/11/95	8/11/95	8/11/95	8/11/95	8/11/95	8/11/95	8/11/95	8/11/95	8/11/95	8/11/95
SAMPLE DEPTH (ft)		OBJECTIVE	0-2	2-4	0-2	0-2	0-2	2-4	0-2	0-2	2-4	0-2
COMPOUND	CRQL(ug/kg)	(ug/kg)										
beta BHC	1.7	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
delta BHC	1.7	N.A.	16 P	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Heptachlor Epoxide	1.7	20	24 DP	N.D.	N.D.	5.8P	N.D.	N.D.	N.D.	N.D.	N.D.	2.5 P
Endosulfan I	1.7	N.A.	N.D.	N.D.	N.D.	3.9	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dieldrin	3.3	44	N.D.	N.D.	N.D.	120 DP	21 P	N.D.	N.D.	N.D.	N.D.	17 P
4,4' DDE	3.3	2,100	430 D	N.D.	590 D	76 DP	400 D	N.D.	2.4 J	2.4 J	N.D.	240 D
Endrin	3.3	N.A.	25 P	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Endosulfan II	3.3	N.A.	4.3	N.D.	N.D.	7.0 P	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
4,4' DDD	3.3	2,900	39 P	N.D.	3.4P	100 DP	1000 DP	N.D.	6.4	6.4	N.D.	420 D
Endosulfan Sulfate	3.3	900	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
4,4' DDT	3.3	2,100	170 D	N.D.	83 D	360 D	2900 D	N.D.	N.D.	N.D.	N.D.	39 DP
Methoxychlor	17	10,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Endrin ketone	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Endrin aldehyde	3.3	N.A.	N.D.	N.D.	N.D.	50 DP	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
alpha Chlorodane	1.7	540	94 DP	N.D.	2.3 P	N.D.	15	N.D.	N.D.	N.D.	N.D.	N.D.
gamma Chloradane	1.7	100	45 DP	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
TOTAL PESTICIDES		10,000	847	0	679	723	4336	0	9	9	0	722

Footnotes:

P0302D	Indicates duplicate sample for P0302
NYSDEC	New York State Department of Environmental Conservation
CRQL	Contract Required Quantitation Limit
24DP	Results exceed NYSDEC Soil Cleanup Objective (NYSDEC, !994)
N.D.	Compound was analyszed but not detected
J	Indicates and estimated value (result detected below the CRQL or one of the quality control criteria out of limits)
E	Concentration exceeds initial calibration range of instrument for that specific analyte
D	Sample has been diluted and re-analyzed; dilution factor is listed in the summary table
P	Greater than 25% difference exists between concentrations calculated from the 2 GC columns; lower of thwo values reported

Table 1. Pesticide Storage Area analytical results for soil Hancock Field,
New York Air National Guard, Syracuse, New York

SAMPLE NUMBER: / DATE SAMPLED: / SAMPLE DEPTH (ft) / COMPOUND	CRQL(ug/kg)	NYDEC CLEANUP OBJECTIVE (ug/kg)	P1124 8/11/95 2-4	P1202 8/11/95 0-2	P1302 8/11/95 0-2	P1402 8/11/95 0-2	P1502 8/11/95 0-2	P1524 8/11/95 2-4	P1602 8/11/95 0-2	P1624 8/11/85 2-4
beta BHC	1.7	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
delta BHC	1.7	N.A.	N.D.	1.9 P	N.D.	N.D.	3.0 P	N.D.	N.D.	N.D.
Heptachlor Epoxide	1.7	20	N.D.	N.D	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Endosulfan I	1.7	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Dieldrin	3.3	44	N.D.	N.D.	N.D.	N.D.	64 P	N.D.	N.D.	N.D.
4,4' DDE	3.3	2,100	N.D.	13	N.D.	N.D.	1200 DP	N.D.	280 DP	N.D.
Endrin	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Endosulfan II	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	8.7 P	N.D.	N.D.	N.D.
4,4' DDD	3.3	2,900	N.D.	42	N.D.	N.D.	5600 DP	N.D.	1200 D	N.D.
Endosulfan Sulfate	3.3	900	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
4,4' DDT	3.3	2,100	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	96 D	N.D.
Methoxychlor	17	10,000	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Endrin ketone	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	4.0 P	N.D.	N.D.	N.D.
Endrin aldehyde	3.3	N.A.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
alpha Chlorodane	1.7	540	N.D.	N.D.	N.D.	N.D.	34 P	N.D.	5.5	N.D.
gamma Chloradane	1.7	100	N.D.	N.D.	N.D.	N.D.	22 P	N.D.	3.2 P	N.D.
TOTAL PESTICIDES		10,000	0	57	0	0	7136	0	1585	0

10

Footnotes:

P0302D	Indicates duplicate sample for P0302
NYSDEC	New York State Department of Environmental Conservation
CRQL	Contract Required Quantitation Limit
24DP	Results exceed NYSDEC Soil Cleanup Objective (NYSDEC, !994)
N.D.	Compound was analyszed but not detected
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E	Concentration exceeds initial calibration range of instrument for that specific analyte
D	Sample has been diluted and re-analyzed; dilution factor is listed in the summary table
P	Greater than 25% difference exists between concentrations calculated from the 2 GC columns; lower of thwo values reported

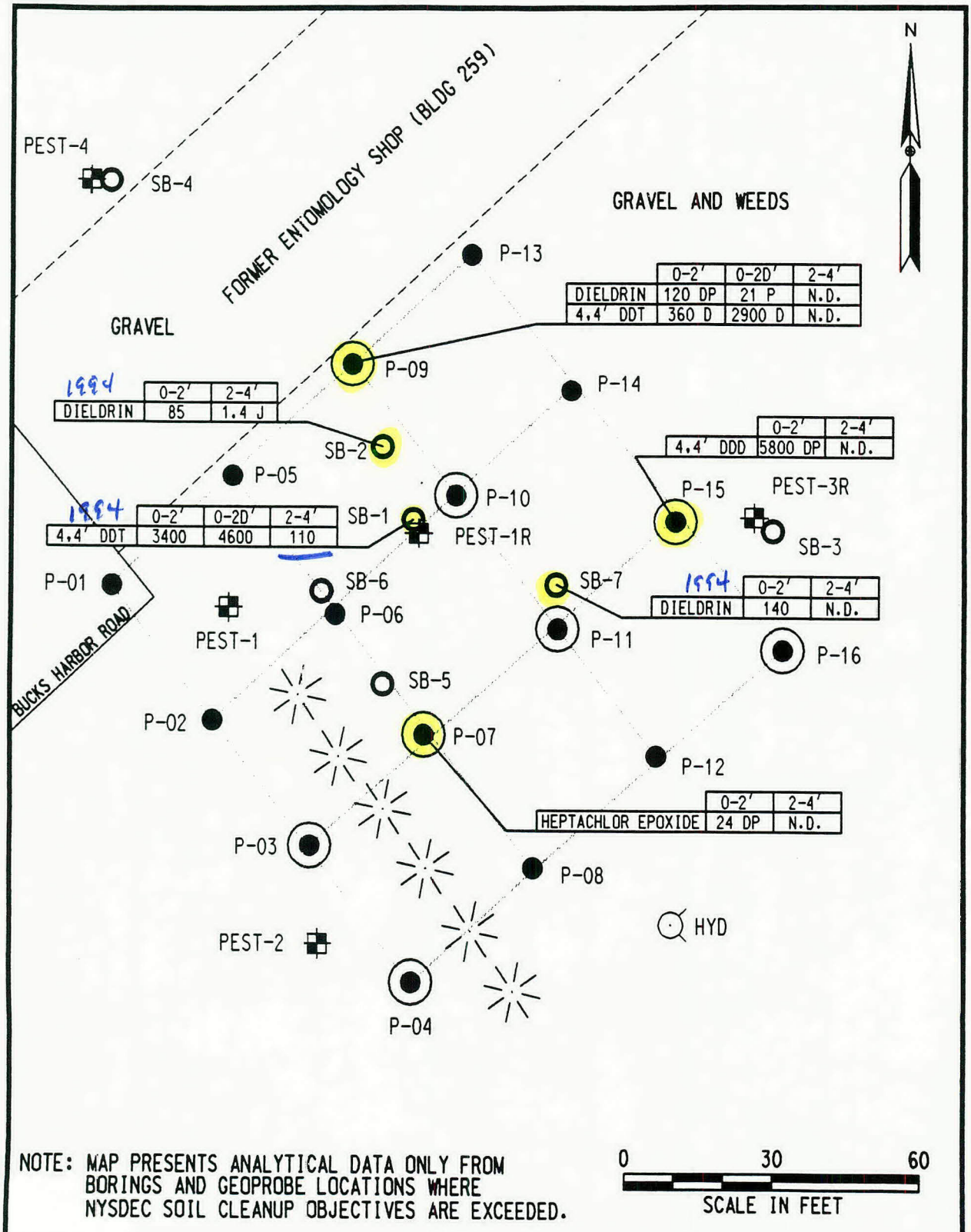

Fig. 3. Sample Locations Exceeding NYSDEC Soil Cleanup Objectives, Pesticide Storage Area.

of 24 DP μg/kg as opposed to the NYSDEC objective of 20 μg/kg and P0902 and P0902 Duplicate had 120 DP μg/kg of dieldrin and 2900 D μg/kg of 4,4'DDT in comparison with NYSDEC levels of 44 μg/kg and 2100 μg/kg, respectively. The concentration of 4,4' DDD in P1502 was found to be a qualified 5800 DP μg/kg, above the NYSDEC cleanup objective of 2900 μg/kg.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The approximately 100 ft by 100 ft sampling grid provided an unbiased basis for evaluating the lateral and vertical extent of contamination at the Pesticide Storage Area. A "T" shaped polygonal area of contamination covering approximately 4220 ft^2 in front of the former entomology shop was identified as exceeding NYSDEC cleanup objectives (Fig. 4). Surface soil contamination was found in the 0 to 2 ft interval. No concentrations of pesticides were detected in the interval sampled from 2 to 4 ft. The most commonly identified pesticides were 4,4' DDT and its metabolites 4,4' DDD and 4,4' DDE. The compounds exceeding soil cleanup objectives set by the NYSDEC included 4,4' DDT, 4,4' DDD, heptachlor epoxide, and dieldrin.

The vertical and lateral distribution of pesticide contamination at the Pesticide Storage Area is consistent with random dumping that may have occured during applicator cleaning. A previous investigation (M&E, 1995) had not found pesticide contamination in the groundwater in any of the site monitoring wells. Although below NYSDEC cleanup standards, low levels of DDT and DDD were found in a previous investigation (M&E, 1995) in soil boring (SB-04) located behind and upgradient from the entomology shop and the location of the tank. Therefore, a leaking tank is not suspected as the cause of the contamination. The presence of DDT and its metabolites would not be unexpected through normal spraying either directly from general use of pesticides or the emptying of hand held tanks and cleaning of equipment.

5.2 RECOMMENDATIONS

The contaminated area exceeding NYSDEC Cleanup Objective (Fig. 4) should be remediated. An evaluation of remedial options should be evaluated. It is estimated that approximately 312 yds^3 of soil would require remediation, based on a 4220 ft^2 contamination area, 2 ft in depth.

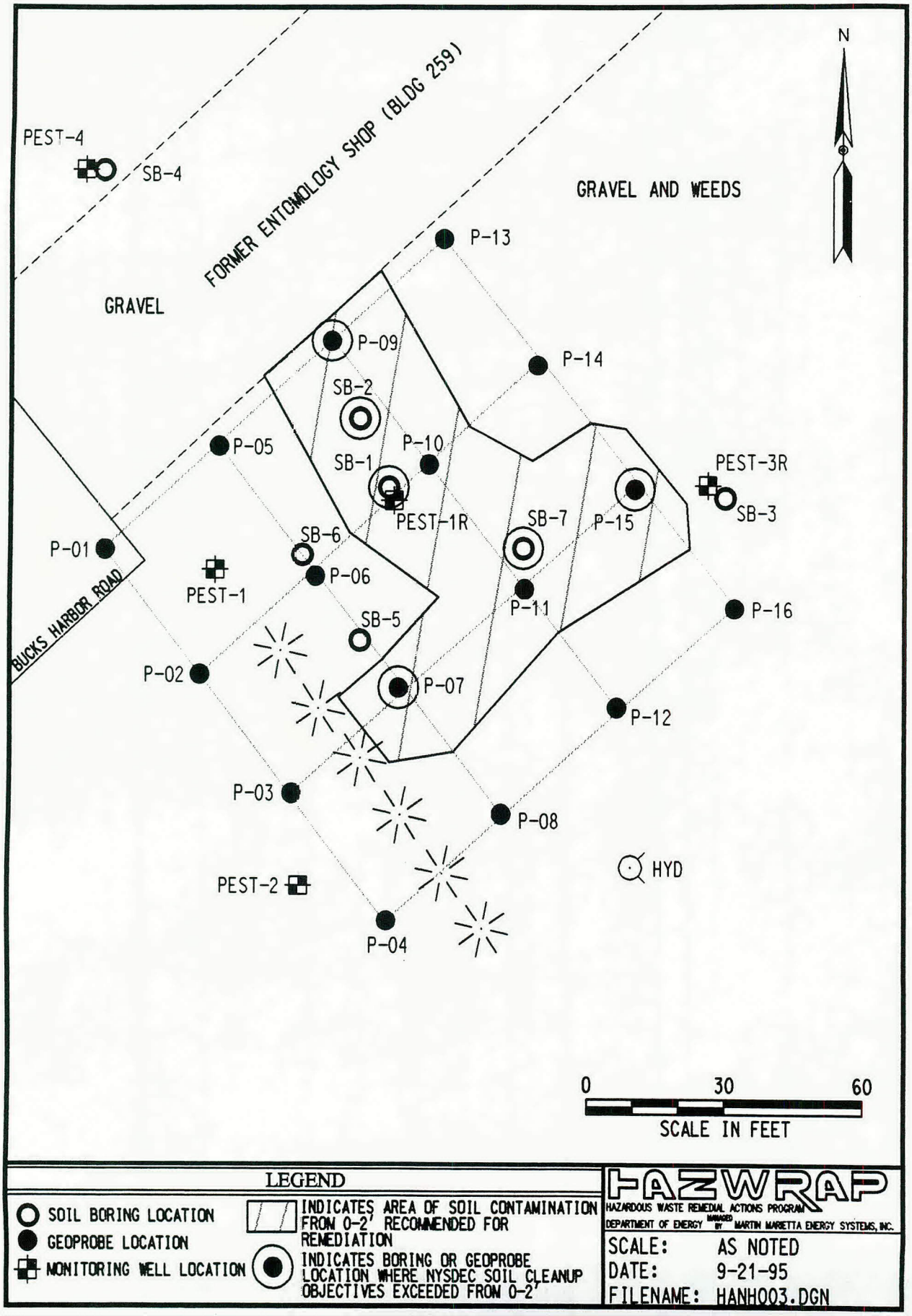

Fig. 4. Area of Soil Contamination Recommended for Remediation, Pesticide Storage Area.

6. REFERENCES

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APPENDIX A

Hawk Engineering Survey Report

95946.01

HAWK ENGINEERING, P.C.

P.O. Box 427
Binghamton, NY 13902-0427
FAX: 607-648-4777
Toll-Free: 1-800-345-HAWK
Phone: 607-648-4168

Shipping Address:
2150 NY Route 12
Binghamton, NY 13901

Kenneth C. Hawk, P.E., L.S.
Founder, 1922-1989
Kenneth C. Hawk, Jr., P.E.
William C. Drachler, P.E., L.S.

Eugene H. Hulbert, L.S.
Thomas E. O'Connor, P.E.
Ronald B. Lake, P.E.
John A. Nichols, L.S.

September 11, 1995

Geo-Marine, Inc.
669 Emory Valley Road
Oak Ridge, Tennessee 37830

Attn: David Noffsinger

Re: Survey & Mapping Services
Geo-Marine, Inc.
174th Tactical Fighter Wing
Hancock Air National Guard
Subcontractor Number 95sc0006-a
City of Syracuse
Onondaga County, New York State

Dear Mr. Noffsinger:

By copy of this letter, we are transmitting digital files of the drawings and the tabulation for the Pesticide Site and the P.O.L. Site for the above captioned project to William Hedberg at HAZWRAP, James Epler Science Center, 900 Tri-County Boulevard, Oliver Springs, Tennessee 37840.

This is being done in accordance with your request of this date.

If you have any questions, please call Rod or myself.

Very truly yours,

HAWK ENGINEERING, p.c.

John A. Nichols, LS
Partner
WJAN2:0911GEO

JAN:lht
Enclosures

c William Hedberg (w/enc.)

UPS OVERNITE

HAWK ENGINEERING, P.C.

HANCCCK FIELD - AIR NATIONAL GUARD- SYRACUSE, N.Y. 95946.01
DATA FOR PESTICIDE SITE *********

DESCRIPTION	NORTHING	EASTING	ELEVATION
HANPS-01	1138576.0	631133.3	405.61
HANPS-02	1138549.8	631154.1	405.03
HANPS-03	1138525.4	631174.1	404.16
HANPS-04	1138499.1	631194.8	404.16
HANPS-05	1138597.6	631158.2	405.29
HANPS-06	1138570.6	631179.3	404.47
HANPS-07	1138547.2	631197.5	403.87
HANPS-08	1138521.3	631219.9	403.53
HANPS-09	1138619.3	631183.4	404.82
HANPS-10	1138593.9	631204.1	404.06
HANPS-11	1138568.0	631225.0	403.36
HANPS-12	1138543.3	631245.1	402.82
HANPS-13	1138641.3	631207.3	404.55
HANPS-14	1138615.0	631227.4	404.10
HANPS-15	1138589.2	631248.7	403.11
HANPS-16	1138564.4	631271.1	402.76
SB-1	1138588.6	631195.5	404.47
SB-2	1138603.4	631189.0	404.79
SB-3	1138587.1	631268.7	402.72
SB-4	1138655.8	631132.8	404.22
SB-5	1138557.1	631189.1	404.05
SB-6	1138575.0	631176.5	404.87
SB-7	1138576.5	631224.7	403.42
WELL-PEST-1@ GRND	1138571.7	631157.4	403.97
WELL-D(1R) @ GRND	1138586.4	631196.5	404.50
WELL-D(1R) TOP PVC			407.53
WELL-D(1R) TOP CASING			407.35
WELL-C(3R) @ GRND	1138589.7	631264.9	403.00
WELL-C(3R) TOP PVC			405.90
WELL-C(3R) TOP CASING			405.96
WELL-B (4) @ GRND	1138655.9	631128.8	404.38
WELL-B (4) TOP PVC			404.24
WELL-B (4) TOP CASING			404.27
WELL-A (2) @ GRND	1138506.4	631175.7	404.50
WELL-A (2) TOP PVC			404.12
WELL-A (2) TOP CASING			404.56
PAINT SPOT (BORING)	1138651.5	631190.4	404.75
PAINT SPOT (BORING)	1138630.6	631174.1	404.80
PAINT SPOT (BORING)	1138611.3	631157.9	404.89
PAINT SPOT (BORING)	1138573.4	631128.2	405.63
STATION-11(1/2" REBAR)	1138631.2	631266.5	403.71
4" PVC	1138504.9	631141.8	403.68
4" PVC	1138469.6	631103.8	404.26

NOTE: HORIZONTAL & VERTICAL DATUMS ARE EXISTING

APPENDIX B

Laboratory Data Table

ORGANIC PESTICIDES/AROCLORS

SAMPLE NUMBER:			P0102		P0102MS		P0102MSD		P0202		P0302	
LAB SAMPLE NO.:			WL1235-1		WL1235-1MS		WL1235-1MSD		WL1235-2		WL1235-3	
MATRIX:			Soil		Soil		Soil		Soil		Soil	
DATE SAMPLED:			08/11/95		08/11/95		08/11/95		08/11/95		08/11/95	
DATE ANALYZED:			08/25/95		08/24/95		08/24/95		08/24/95		08/25/95	
Analyte	**CRQL**	**MDL**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**
alpha-BHC	1.7	0.03	1.8	U	1.8	U	1.8	U	1.9	U	1.9	U
beta-BHC	1.7	0.01	1.8	U	1.8	U	1.8	U	1.9	U	1.9	U
delta-BHC	1.7	0.02	1.8	U	1.8	U	1.8	U	1.9	U	1.9	U
gamma-BHC(Lindane)	1.7	0.03	1.8	U	22		24		1.9	U	1.9	U
Heptachlor	1.7	0.03	1.8	U	19		21		1.9	U	1.9	U
Aldrin	1.7	0.02	1.8	U	17		19		1.9	U	1.9	U
Heptachlor epoxide	1.7	0.01	1.8	U	1.8	U	1.8	U	1.9	U	6.9	P
Endosulfan I	1.7	0.01	1.8	U	1.8	U	1.8	U	1.9	U	1.9	U
Dieldran	3.3	0.03	3.5	U	41		44		3.7	U	21	P
4,4'-DDE	3.3	0.02	3.5	U	3.5	U	3.5	U	3.5	J	200	E
Endrin	3.3	0.02	3.5	U	38		41		3.7	U	3.6	U
Endosulfan II	3.3	0.01	3.5	U	3.5	U	3.5	U	3.7	U	3.6	U
4,4'- DDD	3.3	0.03	3.5	U	3.5	U	3.5	U	3.7	U	30	P
Endosulfan sulfate	3.3	0.01	3.5	U	3.5	U	3.5	U	3.7	U	3.6	U
4,4'-DDT	3.3	0.03	3.5	U	40		43		2.3	JP	190	E
Methoxychlor	17.0	0.02	18	U	18	U	18	U	19	U	19	U
Endrin ketone	3.3	0.02	3.5	U	3.5	U	3.5	U	3.7	U	3.6	U
Endrin aldehyde	3.3	0.03	3.5	U	3.5	U	3.5	U	3.7	U	3.6	U
alpha-Chlordane	1.7	0.02	1.8	U	1.8	U	1.8	U	1.9	U	10	
gamma-Chlordane	1.7	0.02	1.8	U	1.8	U	1.8	U	1.9	U	3.9	
Toxaphene	170.0	3.67	180	U	180	U	180	U	190	U	190	U
Arochlor-1016	33.0	0.70	35	U	35	U	35	U	37	U	36	U
Arochlor-1221	67.0	3.47	72	U	72	U	72	U	75	U	74	U
Arochlor-1232	33.0	1.03	35	U	35	U	35	U	37	U	36	U
Arochlor-1242	33.0	0.67	35	U	35	U	35	U	37	U	36	U
Arochlor-1248	33.0	0.53	35	U	35	U	35	U	37	U	36	U
Arochlor-1254	33.0	0.83	35	U	35	U	35	U	37	U	36	U
Arochlor-1260	33.0	0.67	35	U	35	U	35	U	37	U	36	U
Units (ug/Kg)			ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Dilution			1.0		1.0		1.0		1.0		1.0	
Sample Weight (g)			30.0		30.0		30.0		30.0		30.0	

ORGANIC PESTICIDES/AROCLORS

SAMPLE NUMBER:			P0302DL		P0324		P032D		P0402		P0402DL	
LAB SAMPLE NO.:			WL1235-3DL		WL1234-3		WL1250-1		WL1235-4		WL1235-4DL	
MATRIX:			Soil		Soil		Soil		Soil		Soil	
DATE SAMPLED:			08/11/95		08/11/95		08/11/95		08/11/95		08/11/95	
DATE ANALYZED:			08/29/95		09/01/95		08/23/95		08/24/95		08/24/95	
Analyte	**CRQL**	**MDL**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**
alpha-BHC	1.7	0.03	37	U	2	U	1.8	U	1.9	U	19	U
beta-BHC	1.7	0.01	37	U	2	U	1.8	U	1.9	U	19	U
delta-BHC	1.7	0.02	37	U	2	U	1.8	U	2.3	P	19	U
gamma-BHC(Lindane)	1.7	0.03	37	U	2	U	1.8	U	1.9	U	19	U
Heptachlor	1.7	0.03	37	U	2	U	1.8	U	1.9	U	19	U
Aldrin	1.7	0.02	37	U	2	U	1.8	U	1.9	U	19	U
Heptachlor epoxide	1.7	0.01	37	U	2	U	1.8	U	13	P	19	U
Endosulfan I	1.7	0.01	37	U	2	U	1.8	U	1.9	U	19	U
Dieldran	3.3	0.03	73	U	3.9	U	3.6	U	30	P	37	U
4,4'-DDE	3.3	0.02	440	D	3.9	U	29		190	E	380	D
Endrin	3.3	0.02	73	U	3.9	U	3.6	U	7.6	P	37	U
Endosulfan II	3.3	0.01	73	U	3.9	U	3.6	U	3.7	U	37	U
4,4'- DDD	3.3	0.03	73	U	3.9	U	3.6	U	23	P	37	U
Endosulfan sulfate	3.3	0.01	73	U	3.9	U	3.6	U	3.7	U	37	U
4,4'-DDT	3.3	0.03	160	D	3.9	U	16		240	E	340	D
Methoxychlor	17.0	0.02	370	U	20	U	18	U	19	U	190	U
Endrin ketone	3.3	0.02	73	U	3.9	U	3.6	U	3.7	U	37	U
Endrin aldehyde	3.3	0.03	73	U	3.9	U	3.6	U	3.7	U	37	U
alpha-Chlordane	1.7	0.02	37	U	2	U	1.8	U	19		19	U
gamma-Chlordane	1.7	0.02	37	U	2	U	1.8	U	4.6		19	U
Toxaphene	170.0	3.67	3700	U	200	U	180	U	190	U	1900	U
Arochlor-1016	33.0	0.70	730	U	39	U	36	U	37	U	370	U
Arochlor-1221	67.0	3.47	1500	U	79	U	73	U	75	U	750	U
Arochlor-1232	33.0	1.03	730	U	39	U	36	U	37	U	370	U
Arochlor-1242	33.0	0.67	730	U	39	U	36	U	37	U	370	U
Arochlor-1248	33.0	0.53	730	U	39	U	36	U	37	U	370	U
Arochlor-1254	33.0	0.83	730	U	39	U	36	U	37	U	370	U
Arochlor-1260	33.0	0.67	730	U	39	U	36	U	37	U	370	U
Units (ug/Kg)			ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Dilution			20.0		1.0		1.0		1.0		10.0	
Sample Weight (g)			30.0		30.0		30.0		30.0		30.0	

ORGANIC PESTICIDES/AROCLORS

SAMPLE NUMBER:			P0424		P0502		P0602		P0702		P0702DL	
LAB SAMPLE NO.:			WL1234-4		WL1235-5		WL1235-6		WL1235-7		WL1235-7DL	
MATRIX:			Soil		Soil		Soil		Soil		Soil	
DATE SAMPLED:			08/11/95		08/11/95		08/11/95		08/11/95		08/11/95	
DATE ANALYZED:			09/01/95		08/25/95		08/24/95		08/24/95		08/24/95	
Analyte	**CRQL**	**MDL**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**
alpha-BHC	1.7	0.03	2	U	1.8	U	1.9	U	2	U	20	U
beta-BHC	1.7	0.01	2	U	1.8	U	1.9	U	2	U	20	U
delta-BHC	1.7	0.02	2	U	1.8	U	1.9	U	16	P	20	U
gamma-BHC(Lindane)	1.7	0.03	2	U	1.8	U	1.9	U	2	U	20	U
Heptachlor	1.7	0.03	2	U	1.8	U	1.9	U	2	U	20	U
Aldrin	1.7	0.02	2	U	1.8	U	1.9	U	2	U	20	U
Heptachlor epoxide	1.7	0.01	2	U	1.8	U	1.9	U	24	P	24	DP
Endosulfan I	1.7	0.01	2	U	1.8	U	1.9	U	2	U	20	U
Dieldran	3.3	0.03	3.8	U	3.5	U	3.8	U	3.8	U	38	U
4,4'-DDE	3.3	0.02	3.8	U	3.5	U	10		180	E	430	D
Endrin	3.3	0.02	3.8	U	3.5	U	3.8	U	25	P	38	U
Endosulfan II	3.3	0.01	3.8	U	3.5	U	3.8	U	4.3		38	U
4,4'- DDD	3.3	0.03	3.8	U	3.5	U	3.8	U	39	P	38	U
Endosulfan sulfate	3.3	0.01	3.8	U	3.5	U	3.8	U	3.8	U	38	U
4,4'-DDT	3.3	0.03	3.8	U	3.5	U	505		180	E	170	D
Methoxychlor	17.0	0.02	20	U	18	U	19	U	20	U	200	U
Endrin ketone	3.3	0.02	3.8	U	3.5	U	3.8	U	3.8	U	38	U
Endrin aldehyde	3.3	0.03	3.8	U	3.5	U	3.8	U	3.8	U	38	U
alpha-Chlordane	1.7	0.02	2	U	1.8	U	1.9	U	95	EP	94	DP
gamma-Chlordane	1.7	0.02	2	U	1.8	U	1.9	U	42	EP	45	DP
Toxaphene	170.0	3.67	200	U	180	U	190	U	200	U	2000	U
Arochlor-1016	33.0	0.70	38	U	35	U	38	U	38	U	380	U
Arochlor-1221	67.0	3.47	78	U	71	U	76	U	77	U	770	U
Arochlor-1232	33.0	1.03	38	U	35	U	38	U	38	U	380	U
Arochlor-1242	33.0	0.67	38	U	35	U	38	U	38	U	380	U
Arochlor-1248	33.0	0.53	38	U	35	U	38	U	38	U	380	U
Arochlor-1254	33.0	0.83	38	U	35	U	38	U	38	U	380	U
Arochlor-1260	33.0	0.67	38	U	35	U	38	U	38	U	380	U
Units (ug/Kg)			ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Dilution			1.0		1.0		1.0		1.0		10.0	
Sample Weight (g)			30.0		30.0		30.0		30.0		30.0	

ORGANIC PESTICIDES/AROCLORS

SAMPLE NUMBER:			P0724		P0802		P0802DL		P0902		P0902DL	
LAB SAMPLE NO.:			WL1234-7		WL1235-8		WL1235-8DL		WL1235-9		WL1235-9DL	
MATRIX:			Soil		Soil		Soil		Soil		Soil	
DATE SAMPLED:			08/11/95		08/11/95		08/11/95		08/11/95		08/11/95	
DATE ANALYZED:			09/01/95		08/26/95		08/30/95		08/26/95		08/30/95	
Analyte	**CRQL**	**MDL**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**
alpha-BHC	1.7	0.03	1.8	U	1.8	U	37	U	1.9	U	19	U
beta-BHC	1.7	0.01	1.8	U	1.8	U	37	U	1.9	U	19	U
delta-BHC	1.7	0.02	1.8	U	1.8	U	37	U	1.9	U	19	U
gamma-BHC(Lindane)	1.7	0.03	1.8	U	1.8	U	37	U	1.9	U	19	U
Heptachlor	1.7	0.03	1.8	U	1.8	U	37	U	1.9	U	19	U
Aldrin	1.7	0.02	1.8	U	1.8	U	37	U	1.9	U	19	U
Heptachlor epoxide	1.7	0.01	1.8	U	1.8	U	37	U	5.8	P	19	U
Endosulfan I	1.7	0.01	1.8	U	1.8	U	37	U	3.9		19	U
Dieldran	3.3	0.03	3.5	U	3.5	U	71	U	120	EP	120	DP
4,4'-DDE	3.3	0.02	3.5	U	200	E	590	D	72	E	76	DP
Endrin	3.3	0.02	3.5	U	3.5	U	71	U	3.6	U	36	U
Endosulfan II	3.3	0.01	3.5	U	3.5	U	71	U	7	P	36	U
4,4'- DDD	3.3	0.03	3.5	U	34	P	71	U	120	EP	110	DP
Endosulfan sulfate	3.3	0.01	3.5	U	3.5	U	71	U	3.6	U	36	U
4,4'-DDT	3.3	0.03	3.5	U	110	E	83	D	260	E	360	D
Methoxychlor	17.0	0.02	18	U	18	U	370	U	19	U	190	U
Endrin ketone	3.3	0.02	3.5	U	3.5	U	71	U	72	E	50	DP
Endrin aldehyde	3.3	0.03	3.5	U	3.5	U	71	U	3.6	U	36	U
alpha-Chlordane	1.7	0.02	1.8	U	2.2	P	37	U	1.9	U	19	U
gamma-Chlordane	1.7	0.02	1.8	U	1.8	U	37	U	1.9	U	19	U
Toxaphene	170.0	3.67	180	U	180	U	3700	U	190	U	1900	U
Arochlor-1016	33.0	0.70	35	U	35	U	710	U	36	U	360	U
Arochlor-1221	67.0	3.47	72	U	72	U	1400	U	74	U	740	U
Arochlor-1232	33.0	1.03	35	U	35	U	710	U	36	U	360	U
Arochlor-1242	33.0	0.67	35	U	35	U	710	U	36	U	360	U
Arochlor-1248	33.0	0.53	35	U	35	U	710	U	36	U	360	U
Arochlor-1254	33.0	0.83	35	U	35	U	710	U	36	U	360	U
Arochlor-1260	33.0	0.67	35	U	35	U	710	U	36	U	360	U
Units (ug/Kg)			ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Dilution			1.0		1.0		20.0		1.0		10.0	
Sample Weight (g)			30.0		30.0		30.0		30.0		30.0	

ORGANIC PESTICIDES/AROCLORS

SAMPLE NUMBER:			P0924		P092D		P092DDL		P1002		P1024	
LAB SAMPLE NO.:			WL1234-9		WL1250-2		WL1250-2		WL1235-10		WL1234-10	
MATRIX:			Soil		Soil		Soil		Soil		Soil	
DATE SAMPLED:			08/11/95		08/11/95		08/11/95		08/11/95		08/11/95	
DATE ANALYZED:			09/01/95		08/23/95		08/25/95		08/24/95		09/01/95	
Analyte	**CRQL**	**MDL**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**
alpha-BHC	1.7	0.03	1.9	U	1.8	U	180	U	1.8	U	1.9	U
beta-BHC	1.7	0.01	1.9	U	1.8	U	180	U	1.8	U	1.9	U
delta-BHC	1.7	0.02	1.9	U	1.8	U	180	U	1.8	U	1.9	U
gamma-BHC(Lindane)	1.7	0.03	1.9	U	1.8	U	180	U	1.8	U	1.9	U
Heptachlor	1.7	0.03	1.9	U	1.8	U	180	U	1.8	U	1.9	U
Aldrin	1.7	0.02	1.9	U	1.8	U	180	U	1.8	U	1.9	U
Heptachlor epoxide	1.7	0.01	1.9	U	1.8	U	180	U	1.8	U	1.9	U
Endosulfan I	1.7	0.01	1.9	U	1.8	U	180	U	1.8	U	1.9	U
Dieldran	3.3	0.03	3.8	U	21	P	350	U	3.5	U	3.7	U
4,4'-DDE	3.3	0.02	3.8	U	160	EP	400	D	2.4	J	3.7	U
Endrin	3.3	0.02	3.8	U	3.5	U	350	U	3.5	U	3.7	U
Endosulfan II	3.3	0.01	3.8	U	3.5	U	350	U	3.5	U	3.7	U
4,4'- DDD	3.3	0.03	3.8	U	350	EP	1000	DP	6.4		3.7	U
Endosulfan sulfate	3.3	0.01	3.8	U	3.5	U	350	U	3.5	U	3.7	U
4,4'-DDT	3.3	0.03	3.8	U	370	E	2900	D	3.5	U	3.7	U
Methoxychlor	17.0	0.02	19	U	18	U	1800	U	18	U	19	U
Endrin ketone	3.3	0.02	3.8	U	10		350	U	3.5	U	3.7	U
Endrin aldehyde	3.3	0.03	3.8	U	3.5	U	350	U	3.5	U	3.7	U
alpha-Chlordane	1.7	0.02	1.9	U	15		180	U	1.8	U	1.9	U
gamma-Chlordane	1.7	0.02	1.9	U	1.8	U	180	U	1.8	U	1.9	U
Toxaphene	170.0	3.67	190	U	180	U	18000	U	180	U	190	U
Arochlor-1016	33.0	0.70	38	U	35	U	3500	U	35	U	37	U
Arochlor-1221	67.0	3.47	76	U	72	U	7200	U	71	U	75	U
Arochlor-1232	33.0	1.03	38	U	35	U	3500	U	35	U	37	U
Arochlor-1242	33.0	0.67	38	U	35	U	3500	U	35	U	37	U
Arochlor-1248	33.0	0.53	38	U	35	U	3500	U	35	U	37	U
Arochlor-1254	33.0	0.83	38	U	35	U	3500	U	35	U	37	U
Arochlor-1260	33.0	0.67	38	U	35	U	3500	U	35	U	37	U
Units (ug/Kg)			ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Dilution			1.0		1.0		100.0		1.0		1.0	
Sample Weight (g)			30.0		30.0		30.0		30.0		30.0	

ORGANIC PESTICIDES/AROCLORS

SAMPLE NUMBER:			P1102		P1102DL		P1124		P1202		P1302	
LAB SAMPLE NO.:			WL1235-11		WL1235-11DL		WL1234-11		WL1235-12		WL1235-13	
MATRIX:			Soil		Soil		Soil		Soil		Soil	
DATE SAMPLED:			08/11/95		08/11/95		08/11/95		08/11/95		08/11/95	
DATE ANALYZED:			08/24/95		08/25/95		09/01/95		08/29/95		08/29/95	
Analyte	**CRQL**	**MDL**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**
alpha-BHC	1.7	0.03	1.8	U	18	U	2	U	1.8	U	1.8	U
beta-BHC	1.7	0.01	1.8	U	18	U	2	U	1.9	P	1.8	U
delta-BHC	1.7	0.02	1.8	U	18	U	2	U	1.8	U	1.8	U
gamma-BHC(Lindane)	1.7	0.03	1.8	U	18	U	2	U	1.8	U	1.8	U
Heptachlor	1.7	0.03	1.8	U	18	U	2	U	1.8	U	1.8	U
Aldrin	1.7	0.02	1.8	U	18	U	2	U	1.8	U	1.8	U
Heptachlor epoxide	1.7	0.01	2.5	P	18	U	2	U	1.8	U	1.8	U
Endosulfan I	1.7	0.01	1.8	U	18	U	2	U	1.8	U	1.8	U
Dieldran	3.3	0.03	17	P	35	U	4	U	3.5	U	3.6	U
4,4'-DDE	3.3	0.02	150	EP	240	D	4	U	13		3.6	U
Endrin	3.3	0.02	19	P	35	U	4	U	3.5	U	3.6	U
Endosulfan II	3.3	0.01	5.1	P	35	U	4	U	3.5	U	3.6	U
4,4'- DDD	3.3	0.03	250	E	420	D	4.1		42		3.6	U
Endosulfan sulfate	3.3	0.01	3.5	U	35	U	4	U	3.5	U	3.6	U
4,4'-DDT	3.3	0.03	32	P	39	DP	4	U	3.5	U	3.6	U
Methoxychlor	17.0	0.02	18	U	180	U	20	U	18	U	18	U
Endrin ketone	3.3	0.02	3.5	U	35	U	4	U	3.5	U	3.6	U
Endrin aldehyde	3.3	0.03	3.5	U	35	U	4	U	3.5	U	3.6	U
alpha-Chlordane	1.7	0.02	1.8	U	18	U	2	U	1.8	U	1.8	U
gamma-Chlordane	1.7	0.02	3.7	P	18	U	2	U	1.8	U	1.8	U
Toxaphene	170.0	3.67	180	U	1800	U	200	U	180	U	180	U
Arochlor-1016	33.0	0.70	35	U	350	U	40	U	35	U	36	U
Arochlor-1221	67.0	3.47	71	U	710	U	81	U	72	U	73	U
Arochlor-1232	33.0	1.03	35	U	350	U	40	U	35	U	36	U
Arochlor-1242	33.0	0.67	35	U	350	U	40	U	35	U	36	U
Arochlor-1248	33.0	0.53	35	U	350	U	40	U	35	U	36	U
Arochlor-1254	33.0	0.83	35	U	350	U	40	U	35	U	36	U
Arochlor-1260	33.0	0.67	35	U	350	U	40	U	35	U	36	U
Units (ug/Kg)			ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Dilution			1.0		10.0		1.0		1.0		1.0	
Sample Weight (g)			30.0		30.0		30.0		30.0		30.0	

ORGANIC PESTICIDES/AROCLORS

SAMPLE NUMBER:			P1402		P1502		P1502DL		P1524		P1602	
LAB SAMPLE NO.:			WL1235-14		WL1235-15		WL1235-15DL		WL1234-15		WL1235-16	
MATRIX:			Soil		Soil		Soil		Soil		Soil	
DATE SAMPLED:			08/11/95		08/11/95		08/11/95		08/11/95		08/11/95	
DATE ANALYZED:			08/26/95		08/26/95		08/30/95		09/01/95		08/24/95	
Analyte	**CRQL**	**MDL**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**		**Lab Qualifer**
alpha-BHC	1.7	0.03	1.8	U	1.9	U	390	U	1.8	U	1.8	U
beta-BHC	1.7	0.01	1.8	U	1.9	U	390	U	1.8	U	1.8	U
delta-BHC	1.7	0.02	1.8	U	3	P	390	U	1.8	U	1.8	U
gamma-BHC(Lindane)	1.7	0.03	1.8	U	1.9	U	390	U	1.8	U	1.8	U
Heptachlor	1.7	0.03	1.8	U	1.9	U	390	U	1.8	U	1.8	U
Aldrin	1.7	0.02	1.8	U	1.9	U	390	U	1.8	U	1.8	U
Heptachlor epoxide	1.7	0.01	1.8	U	1.9	U	390	U	1.8	U	1.8	U
Endosulfan I	1.7	0.01	1.8	U	1.9	U	390	U	1.8	U	1.8	U
Dieldran	3.3	0.03	3.4	U	57	P	750	U	3.6	U	3.5	U
4,4'-DDE	3.3	0.02	3.4	U	3.8	U	1400	DP	3.6	U	160	E
Endrin	3.3	0.02	3.4	U	3.8	U	750	U	3.6	U	3.5	U
Endosulfan II	3.3	0.01	3.4	U	7.7	P	750	U	3.6	U	3.5	U
4,4'- DDD	3.3	0.03	3.4	U	3.8	U	6700	DP	3.6	U	320	E
Endosulfan sulfate	3.3	0.01	3.4	U	3.8	U	750	U	3.6	U	3.5	U
4,4'-DDT	3.3	0.03	3.4	U	200	E	750	U	3.6	U	100	EP
Methoxychlor	17.0	0.02	18	U	19	U	3900	U	18	U	18	U
Endrin ketone	3.3	0.02	3.4	U	4.1	P	750	U	3.6	U	3.5	U
Endrin aldehyde	3.3	0.03	3.4	U	3.8	U	750	U	3.6	U	3.5	U
alpha-Chlordane	1.7	0.02	1.8	U	30	P	390	U	1.8	U	5.5	
gamma-Chlordane	1.7	0.02	1.8	U	22	P	390	U	1.8	U	3.2	P
Toxaphene	170.0	3.67	180	U	190	U	39000	U	180	U	180	U
Arochlor-1016	33.0	0.70	34	U	38	U	7500	U	36	U	35	U
Arochlor-1221	67.0	3.47	70	U	76	U	15000	U	73	U	71	U
Arochlor-1232	33.0	1.03	34	U	38	U	7500	U	36	U	35	U
Arochlor-1242	33.0	0.67	34	U	38	U	7500	U	36	U	35	U
Arochlor-1248	33.0	0.53	34	U	38	U	7500	U	36	U	35	U
Arochlor-1254	33.0	0.83	34	U	38	U	7500	U	36	U	35	U
Arochlor-1260	33.0	0.67	34	U	38	U	7500	U	36	U	35	U
Units (ug/Kg)			ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Dilution			1.0		1.0		200.0		1.0		1.0	
Sample Weight (g)			30.0		30.0		30.0		30.0		30.0	

ORGANIC PESTICIDES/AROCLORS

SAMPLE NUMBER:			P1602DL		P1624	
LAB SAMPLE NO.:			WL1235-16DL		WL1234-16	
MATRIX:			Soil		Soil	
DATE SAMPLED:			08/11/95		08/11/95	
DATE ANALYZED:			08/29/95		09/01/95	
Analyte	**CRQL**	**MDL**		**Lab Qualifer**		**Lab Qualifer**
alpha-BHC	1.7	0.03	45	U	2.1	U
beta-BHC	1.7	0.01	45	U	2.1	U
delta-BHC	1.7	0.02	45	U	2.1	U
gamma-BHC(Lindane)	1.7	0.03	45	U	2.1	U
Heptachlor	1.7	0.03	45	U	2.1	U
Aldrin	1.7	0.02	45	U	2.1	U
Heptachlor epoxide	1.7	0.01	45	U	2.1	U
Endosulfan I	1.7	0.01	45	U	2.1	U
Dieldran	3.3	0.03	87	U	4.1	U
4,4'-DDE	3.3	0.02	280	DP	4.1	U
Endrin	3.3	0.02	87	U	4.1	U
Endosulfan II	3.3	0.01	87	U	4.1	U
4,4'- DDD	3.3	0.03	1200	D	4.1	U
Endosulfan sulfate	3.3	0.01	87	U	4.1	U
4,4'-DDT	3.3	0.03	96	D	4.1	U
Methoxychlor	17.0	0.02	450	U	21	U
Endrin ketone	3.3	0.02	87	U	4.1	U
Endrin aldehyde	3.3	0.03	87	U	4.1	U
alpha-Chlordane	1.7	0.02	45	U	2.1	U
gamma-Chlordane	1.7	0.02	45	U	2.1	U
Toxaphene	170.0	3.67	4500	U	210	U
Arochlor-1016	33.0	0.70	870	U	41	U
Arochlor-1221	67.0	3.47	1800	U	84	U
Arochlor-1232	33.0	1.03	870	U	41	U
Arochlor-1242	33.0	0.67	870	U	41	U
Arochlor-1248	33.0	0.53	870	U	41	U
Arochlor-1254	33.0	0.83	870	U	41	U
Arochlor-1260	33.0	0.67	870	U	41	U
Units (ug/Kg)			ug/Kg		ug/Kg	
Dilution			25.0		1.0	
Sample Weight (g)			30.0		30.0	