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REMEDIAL ACTION MASTER PLAN

LEMON LANE LANDFILL

01-5V29

June 6, 1983

NONDISCLOSURE STATEMENT

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TABLE OF CONTENTS
LEMON LANE LANDFILL
01-5V29.0

List of Figures

List of Tables

GLT418/29

1.0 EXECUTIVE SUMMARY

This document is a Remedial Action Master Plan (RAMP) for the Lemon Lane Landfill (LLL) site in Bloomington, Indiana. A RAMP is a plan for undertaking remedial investigation activities and remedial actions in response to a hazardous substance release, or a substantial threat of release, into the environment. It is based upon the National Oil and Hazardous Substances Contingency Plan (NCP) promulgated by the Environmental Protection Agency (EPA) on July 16, 1982 (47 FR 31180-31243).

This document is based on readily available data. No new data were generated during preparation of this RAMP.

1.1 PURPOSE

The specific purpose of this RAMP is to define the scope of remedial investigation activities or remedial actions for the Lemon Lane Landfill site along with a schedule of implementation. The RAMP provides cost estimates for each proposed activity and identifies data limitations, community relations strategies, and possible problems that may be encountered during project implementation.

1.2 SITE DESCRIPTION

Lemon Lane Landfill is located on the western edge of Bloomington, Indiana. Residential neighborhoods and a livestock pasture surround the site. The site is 10.7 acres, 3 acres of which are owned by Mr. and Mrs. Pelfree and the remainder is owned by the City of Bloomington. The site is partially overgrown with vegetation including small trees and bushes. Pedestrian access to the site is virtually unimpeded.

1.3 PROBLEM STATEMENT

Disposal of capacitors containing PCB oils has occurred onsite. Capacitors and their internal paper and foil windings are visible along the southern boundary and in the southwest section of the site. Capacitors may also have been dumped in a sinkhole located on the western half of the site, as was reported by Mr. Pelfree. This sinkhole and another adjacent to it were filled with various municipal and possibly industrial wastes during the years of active operation, 1950 to 1964. Soil sampling by others onsite has shown PCB contamination ranging from 0.1 ppm to 330,000 ppm.

Capacitors may have been carried from the site, as reported by local residents, for the purpose of scavenging copper. Soil on the property of Leon Mullis and at two wooded depressions one-half mile southeast of the site is reported to be contaminated with PCB's.

1.4 LIMITATIONS

Several types of limitations apply to the RAMP process. Those that follow are considered particularly relevant to the RAMP process for the Lemon Lane Landfill.

1.4.1 Data Limitations

- Data being collected as part of a court suit between the City of Bloomington and Westinghouse Corporation were not available for inclusion in the RAMP.

- Due to the possibility of rock fractures and solution features in the limestone bedrock contaminated groundwater may be restricted to narrow zones. Since groundwater monitoring by EPA is limited to

four wells immediately offsite some contaminated groundwater may, therefore, be undetected.

- Sampling to date has not firmly defined the extent of contaminated surface water and sediment or migration pathways.

- The areal distribution and depth of contaminated soil has not been established. Locations of additional "hot spots" onsite or offsite have not been fully established.

- Air quality at the site is undefined.

- Topographic data is limited.

- Presence of buried capacitors onsite and offsite has not been investigated.

- Bioaccumulation of PCB's in wildlife and cattle has not been analyzed.

1.4.2 Study Limitations

- The RAMP does not provide specific remedial actions due to a lack of information necessary to conduct a feasibility study for them.

- Costs provided are Order-of-Magnitude only. This type of estimate is defined by the American Association of Cost Engineers as follows: "An approximate estimate made without detailed engineering data. Examples include: an estimate from cost-capacity curves, an estimate using scale-up or scale-down factors, and an approximate ratio estimate. It is

expected that an estimate of this type will be accurate within +50 percent and -30 percent."

- The RAMP is basically a planning document with tasks and subtasks suggested as minimum efforts to accomplish its objectives.

- The RAMP budget and development schedule did not permit a complete and exhaustive consideration of all remedial planning activities.

1.5 INITIAL REMEDIAL MEASURES

The purpose of initial remedial measures (IRM's) at the Lemon Lane Landfill site is to reduce imminent hazards to public health associated with the presence of PCB's in onsite soils.

The IRM's identified for the Lemon Lane Landfill site are:

- Fencing and installation of warning signs.
- Installation of impermeable membrane over exposed capacitors.
- Issuance of an advisory notice.

1.6 REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Before alternatives for remedial actions can be analyzed, there must be sufficient information available to evaluate them. Gathering of this information will be completed in a remedial investigation/feasibility study (RI/FS).

1.6.1 Preparation of Work Plan

This activity will refine the scope of work for the RI/FS discussed in this RAMP. It will develop a schedule and work plan to implement the recommended RI/FS activities.

The tasks for this activity are:

- o Assemble project team
- o Gather and review background data
- o Prepare quality assurance plan
- o Identify preliminary goals and objectives
- o Prepare and submit draft work plan and final work plan

1.6.2 Site Definition Activities

This activity will define the physical characteristics of the site and establish onsite health and safety facilities for use by all field personnel.

The following tasks are recommended:

- o Prepare a site health and safety assessment
- o Establish site safety facilities
- o Conduct site mapping program
- o Conduct survey for buried capacitors at the wooded depressions
- o Update work plan

1.6.3 Detailed Site Characterization Studies

Currently, available data on the Lemon Lane Landfill site are insufficient to allow the selection, screening, and feasibility study of remedial action alternatives. The following proposed remedial investigations will result in detailed site data to meet the above objectives for the site.

- o Residential well monitoring
- o Installation of additional groundwater monitoring wells
- o Groundwater sampling and analysis
- o Soil sampling and analysis
- o Surface water sampling and analysis
- o PCB bioaccumulation study

1.6.4 Remedial Investigation Report

All data collected and summarized during the previous activity will be evaluated to determine whether or not a hazard to human health or welfare or the environment exists. A final report will then be prepared.

1.6.5 Evaluation of Remedial Action Alternatives

This activity will evaluate the alternative remedial actions on the basis of economic, environmental, and engineering criteria and select an alternative or combination of alternatives for conceptual design and implementation.

The tasks necessary to complete this activity are contained in the following activities:

- o Develop listing of potential alternatives
- o Develop screening criteria
- o Additional engineering studies
- o Technology assessment
- o Refine alternatives
- o Economic assessment
- o Environmental effects
- o Engineering assessment
- o Comparative ranking of alternatives
- o Comparative ranking review meetings

1.6.6 Alternative Remedial Actions Feasibility Report

A report summarizing data developed during the evaluation of alternatives and documenting the alternative remedial actions assessment process will be prepared. On the basis of the entire evaluation process, one alternative or a combination of alternatives will be recommended for consideration in the conceptual design.

1.6.7 Conceptual Design

The major consideration of the conceptual design will be to prepare a conceptual design consistent with the objectives of the proposed remedial actions, and is intended to be sufficient to prepare an Order-of-Magnitude level cost estimate.

1.7 COST ESTIMATE AND TIME SCHEDULE

The cost estimates and schedule for the initial remedial measures and the remedial investigation activities are shown in Figures 1-1 and 1-2. The task descriptions for each initial remedial measure and RI/FS activity define the basis for the associated cost estimates.

GLT418/22

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Figure 1-1
IRM COST ESTIMATE AND SCHEDULE
LEMON LANE LANDFILL
W65129.00

Initial Remedial Measures	ESTIMATED COST Low($)	High($)	SCHEDULE OF WEEKS 2	4	6	8	10	12	14	16	18	20
Fencing and Warning Signs for LLL	$25,800	$ 38,700	----------	———								
Installation of Nonpermeable Membrane over Exposed Exposed Capacitor Area	57,900	86,800			----------	----------	----------	———	———	———	———	
Press Release	1,300	2,000		———								
TOTAL	$85,000	$127,500										

-------- Preparation of Contract Documents and Subcontractor Selection.

GLT418/8-2

Figure 1-2
RI/FS COST ESTIMATE AND SCHEDULE
LEMON LANE LANDFILL
W65129.00

Task	ESTIMATED COST Low	ESTIMATED COST High	SCHEDULE (MONTHS ELAPSED) 0	2	4	6	8	10	12	14	16
1. Work Plan Preparation	$ 11,500	$ 17,300	------								
2. Site Definition Activities	35,200	53,000	----------								
3. Detailed Site Characterization Studies	168,200	252,200			----------						
4. Remedial Investigation Report	12,400	18,500					------				
5. Evaluation of Remedial Action Alternatives	27,000	40,500						----------			
6. Feasibility Report	9,300	13,900								------	
7. Conceptual Report	28,700	43,000									--------
8. Project Management	24,000	36,000	----------								
TOTAL	316,300	474,400									

GLT418/23

2.0 DATA EVALUATION

2.1 OBJECTIVE

This section presents available technical data and nontechnical information on the Lemon Lane Landfill (LLL) site and its immediate surroundings. It also summarizes potential impacts resulting from the LLL site contamination based on available information. Evaluation of existing data determines data limitations and the need for remedial investigations and measures.

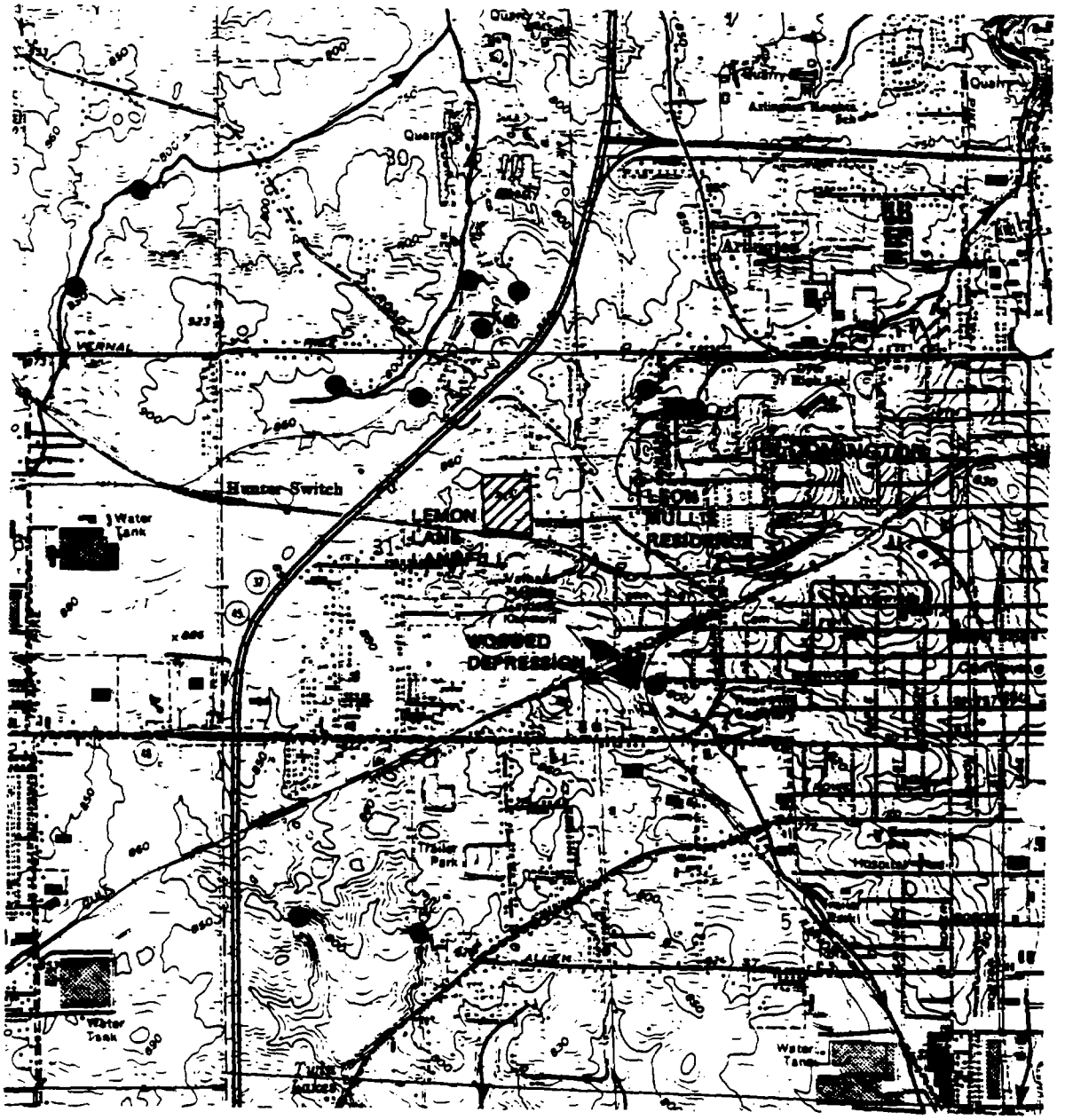
Data being collected as part of a court suit between the City of Bloomington and Westinghouse Corporation were not available for inclusion in the RAMP.

2.2 BACKGROUND

2.2.1 Site Description

Lemon Lane Landfill is located on the western edge of Bloomington, Indiana (Figure 2-1). Residential neighborhoods and a livestock pasture surround the site. The site is 10.7 acres, of which 3 acres is owned by Mr. and Mrs. Pelfree and the remainder by the City of Bloomington (Figure 2-2).

Landfilling of municipal and industrial waste by the city occurred in the 1950's and 60's on the city property. Some spill over onto the Pelfree property has occurred. A large sinkhole located on the western half of the city property was filled with wastes during the course of operation. Disposal of capacitors containing PCB oils has occurred onsite. Capacitors and their internal paper and foil windings are visible along the southern boundary and in the southwest area of the site (see Figure 2-2). It has been reported by



LEGEND

● SPRINGS

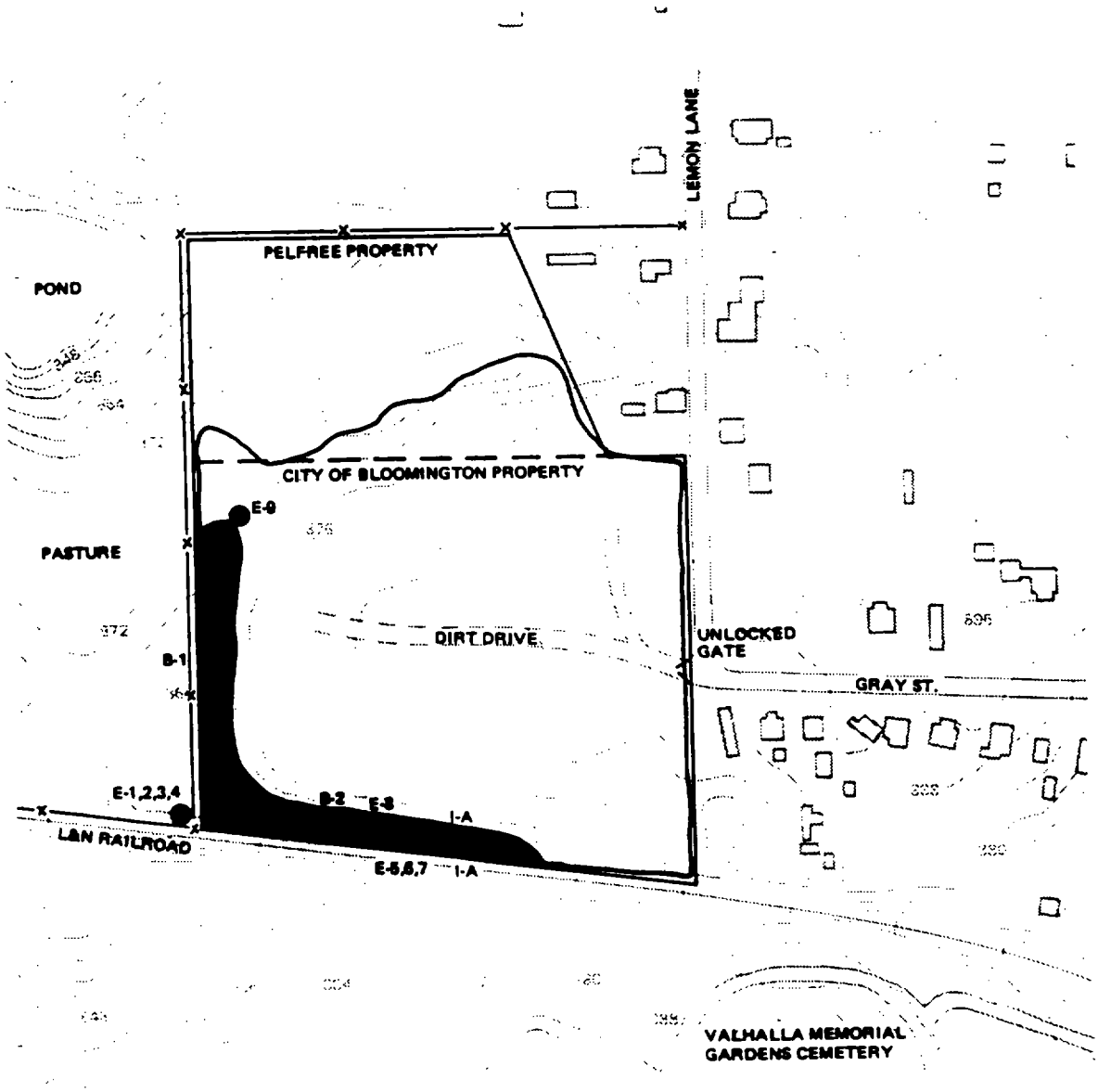
N

0 4000

2000

SCALE IN FEET

FIGURE 2-1
LOCATION MAP
LEMON LANE LANDFILL



LEGEND

- SITE BOUNDARY
- PROPERTY LINES
- EXPOSED CAPACITORS
- LIVESTOCK FENCE
- LANDFILL LIMIT
- SOIL SAMPLE LOCATION

NOTE: Location of 2 samples taken by the City of Bloomington was unavailable for RAMP.

N

0 400

200

SCALE IN FEET

FIGURE 2-2
SITE MAP
LEMON LANE LANDFILL

Indiana State Board of Health (ISBH) personnel that some of these capacitors contained Westinghouse Corporation labels. Capacitors may also have been dumped in the sinkhole area as was reported by Mr. Pelfree.

The site is partially overgrown with vegetation including small trees and bushes. Vehicular access is partially restricted by an unlocked gate on the east site boundary at the end of Gray Street. Recent dumping of landscaping waste has occurred. Livestock fencing is located on the western and northern boundaries. Pedestrian access to the site is virtually unimpeded. Evidence of intrusion includes footpaths and bicycle tire marks. A summary of observations made during the RAMP site visit is in Appendix A.

2.2.2 Site History

Landfilling by the City is believed to have begun in 1950 and continued through 1964. Some dumping may also have occurred before 1950. It has been reported that extensive burning of wastes occurred onsite during the period of operation.

Analysis of aerial photography showed the landfill to be approximately 5.5 acres in 1954. It was primarily covered by municipal refuse. Approximately 2 acres were added to the site by 1967.

The ISBH was first notified of the existence of capacitors containing PCB's at the site on June 22, 1981 by a local citizen. Analysis of soil samples by the ISBH was reported to show PCB contamination. Environmental monitoring since 1981 has included additional soil, pond water, spring water, sediment and groundwater samples.

There have been several citizen reports that capacitors were routinely broken open by adults and children to scavenge copper from the interior parts. At least two reports have indicated that some capacitors were carried offsite before being opened. Mr. Leon Mullis reported that as a child he carried capacitors from Lemon Lane Landfill to his residence at 1204 North Lindberg (See Figure 2-1). Another report indicated that capacitors from the site may have been dumped and possibly buried in a wooded depression 2,000 feet southeast of the landfill (See Figure 2-1).

The City of Bloomington is suing Westinghouse in regards to Lemon Lane Landfill and other PCB contamination in Bloomington. The Court has granted a stay of the suit to allow the parties to jointly conduct environmental studies, including groundwater monitoring, surface water monitoring and residential well sampling. The data presently being generated is under a strict confidentiality agreement between the parties.

2.2.3 Remedial Actions to Date

No remedial actions have occurred onsite to date.

2.2.4 Chronology

A chronology of the LLL site is presented in Appendix B.

2.3 HAZARDOUS MATERIALS CHARACTERIZATION

No records of types or quantities of wastes disposed at LLL were kept during its operation. Exposed capacitors and interior parts have been identified onsite. Soil containing polychlorinated biphenols (PCB's) in excess of 50 ppm has been reported. According to EPA criteria appearing in the Federal Register, May 31, 1979, materials containing over 50

ppm PCB's are hazardous substances. Physical properties of commercial PCB's are summarized in Table 2-1. It is not known if other hazardous substances were disposed of onsite.

The burning of wastes onsite, as reported to have occurred, could possibly cause formation of toxic byproducts. Accidental fires involving PCB's have resulted in the formation of highly toxic polychlorinated dibenzofurans and polychlorinated biphenylenes at other locations (Rappe, et al., 1982).

2.4 ENVIRONMENTAL SETTING

2.4.1 Physiography

The site is situated on the eastern margin of the Mitchell Plain physiographic unit. This unit is characterized by sinkholes, sinking streams and springs associated with subterranean drainage through solution features in the bedrock.

The site is located on top of a ridge that runs westward from the site (see Figure 2-1). To the north, east, and south, the ground surface drops away into the adjacent valleys. The ridge line that the site is located on appears to form a local divide, with surface drainage either to the north or south.

Sinkholes, which are a common feature in this area, appear to be associated with the ridge line and topographic highs of the area. Sinkholes are predominant in a band that trends south-southwest from the site. Two major sinks were located on the west side of the site prior to its usage as a landfill. A sink located immediately north of the site is a wet weather surface water body and the sink northwest of the site appears to be a permanent sink pond. Figure 2-3 illustrates the

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Table 2-1
PHYSICAL PROPERTIES OF COMMERCIAL PCB's
LEMON LANE LANDFILL SITE
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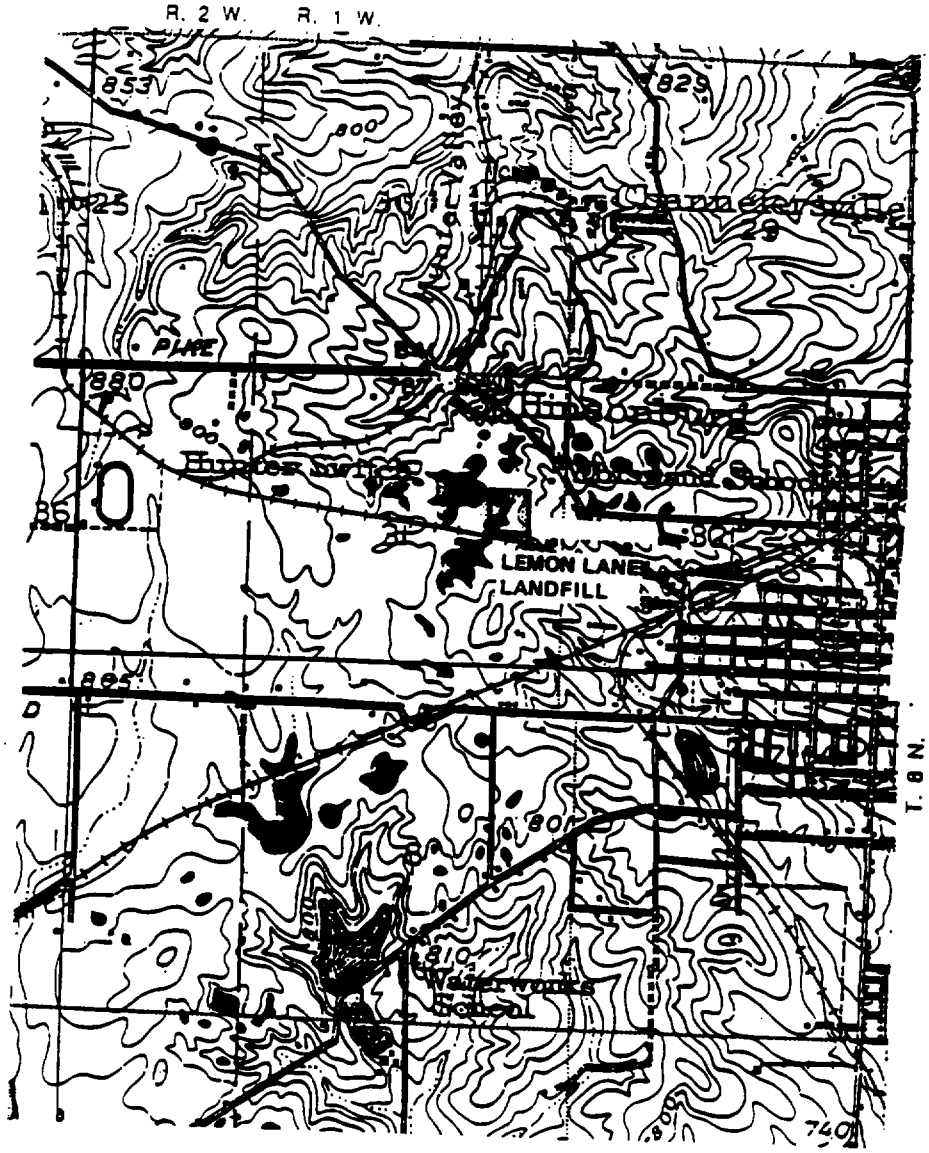
Property	AROCLOR[a] 1016[b]	1221[b]	1242[b]	1248[b]	1254	1260	1268
Appearance	Thin clear oil	Thin clear oil	Thin clear oil	--	Light yellow thick oil	Sticky resins	Sticky resins
Specific Gravity (25°C)	1.36	1.18	1.38	--	1.50	1.57	1.61
Distillation Range (°C)	323-356	275-320	325-366	--	365-390	385-420	435-450
Vaporization Rate (100°C)-mg/cm²/hr	--	1.74	0.34	--	0.05	--	--
% Loss in 6 hours (100°C)	--	--	--	--	0-0.2%	0.01%	0-0.1%
Solubility - ppm	--	--	0.703	--	0.07	--	--
Hydrolysis (t 1/2)	--	--	Stable	--	Stable	--	--
Sorption (Koc)	--	--	12,400	--	42,500	--	--
Bioaccumulation (log Kow)	--	--	4.40	--	6.11	--	--
Biotransformation/Biodegration	--	--	Isomers with less than 3 Cl	--	Not degraded	--	--
Mobility Class	--	--	Immobile	--	Immobile	--	--
Flash Point (°F)	--	--	348-356	349-384	None	None	None
Vapor pressure - mm Hg	--	--	10 (170°C)	50 (225°C)	--	--	--
Autoignition temperature (°F)	--	--	None	None	--	--	--

[a] Trademark of Monsanto Corp.
[b] Used in Capacitors

Adapted from Hurtzinger, et al., 1974, NIOSH 1977, IARC 1978 in Robert James, Morris Cramer, Raymond Harrison, "Technical Review of the Health Effects of PCB's," Ecology and Environment, Inc., 1981.
Geotechnical Materials Consultants, Inc., "Groundwater Contamination Study, Springfield and Rose Townships, Oakland County, Michigan," 1982.
Irving Sax, Dangerous Properties Industrial Materials, 1968.



LEGEND

SINKHOLE LOCATIONS

SOURCE: USGS Topographic Map,
Bloomington Quadrangle, 1908.

FIGURE 2-3
SINKHOLE LOCATIONS
LEMON LANE LANDFILL

sinkholes located in the area as determined from the U.S. Geologic Survey 1908 Topographic Map.

2.4.2 Geology

Site soil is immediately underlain by Mississippian Age limestone, dolomite and shale of the St. Louis formation. The Salem formation, which underlies the St. Louis formation, contains a building stone bed that is mined about a mile north of the site. Near vertical joints in the St. Louis formation trend north-south and east-west. The north-south set has the widest spacing of the two sets.

In May 1982, a study of bedrock depth and sinkhole locations using seismic refraction, ground penetrating radar and electrical resistivity, was conducted onsite as a part of FIT activities. Ground penetrating radar and electrical resistivity did not yield interpretable data. Seismic refraction resulted in delineation of bedrock depth. Figure 2-4 shows the location of the two sinkholes upon which the landfill was developed. A cross section of the landfill through one sinkhole is shown in Figure 2-5.

Four monitoring wells were installed by Ecology and Environment, Inc., as part of the FIT activities around the site perimeter (Figure 2-6). All were finished in the St. Louis formation in July and August 1982. Boring B-1 was drilled through the St. Louis formation into the Salem formation to help define the underlying stratigraphy. Geological cross sections from the boring data of two residential wells and the four monitoring wells are shown in Figure 2-7. The locations of the cross sections are shown in Figure 2-6. The thickness of the St. Louis formation is estimated to vary from 50 to 80 feet thick in the vicinity of the site. This formation contains numerous zones of clay or shale intermixed

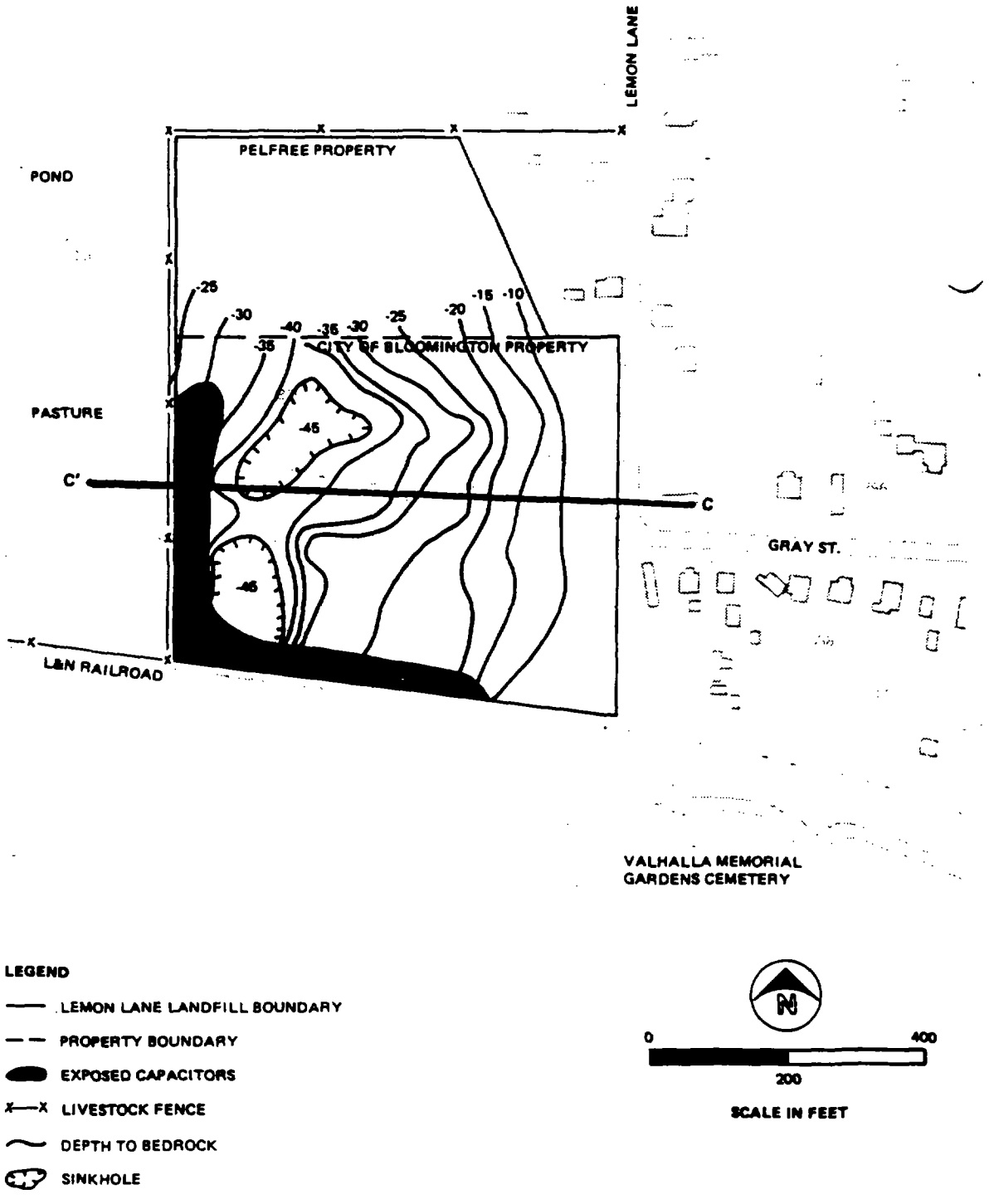
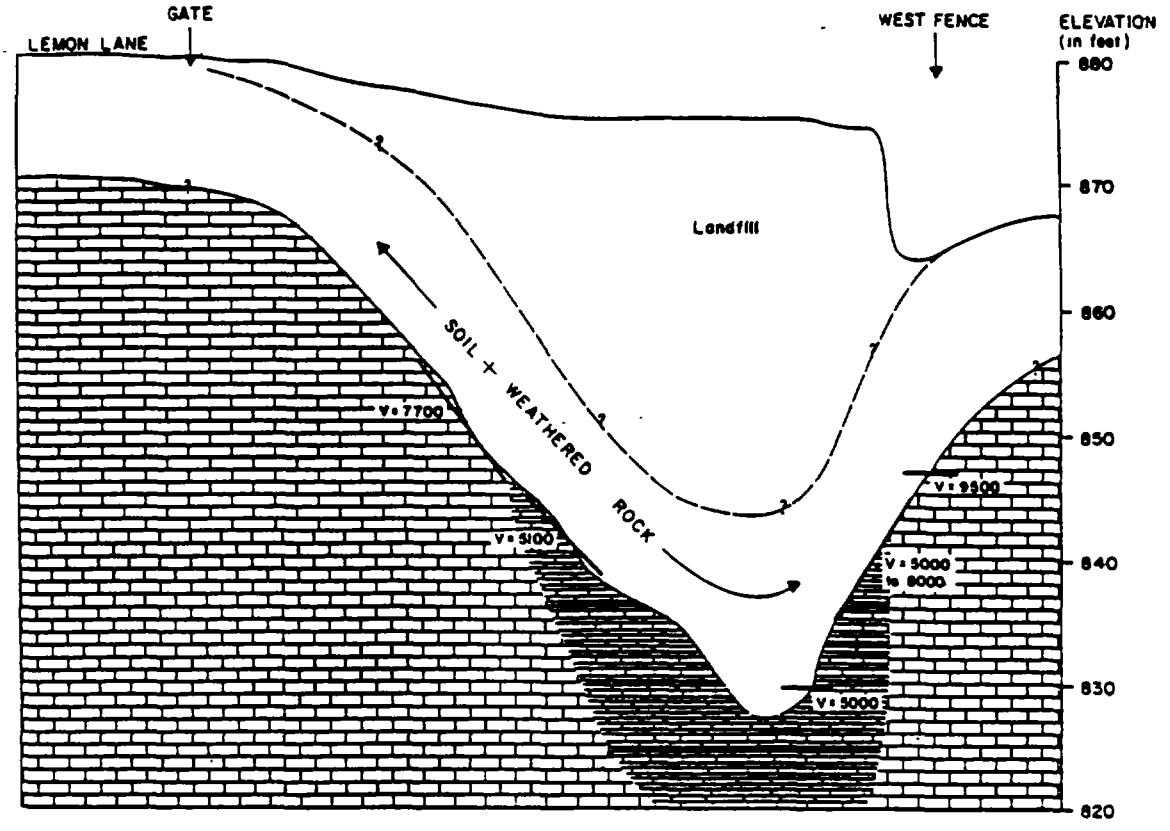
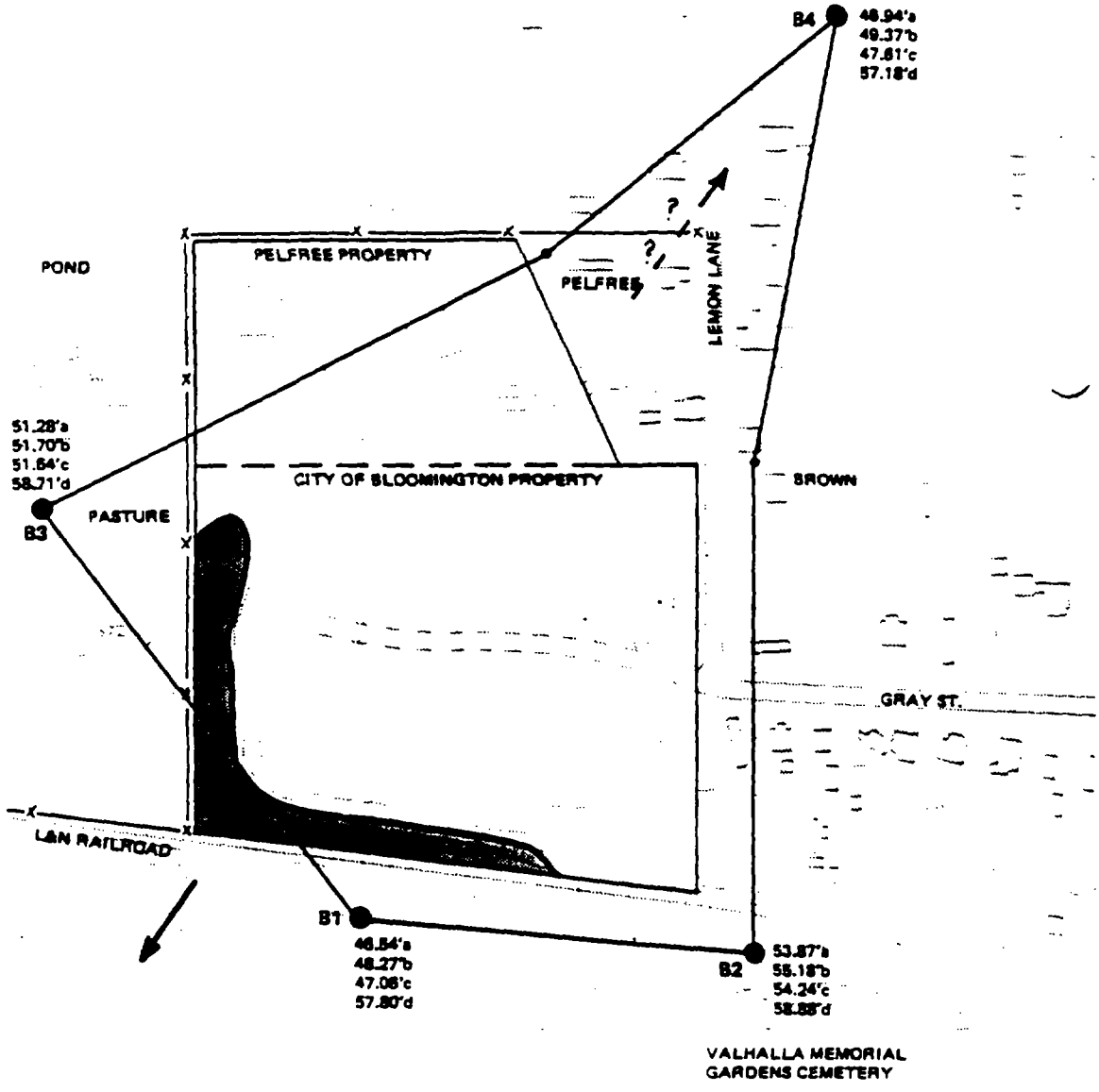


FIGURE 2-4
DEPTH TO BEDROCK
LEMON LANE LANDFILL



SOURCE: LEMON LANE LANDFILL INVESTIGATION.
Technos Inc. May, 1982.

FIGURE 2-5
SEISMIC CROSS SECTION C-C'
LEMON LANE LANDFILL



LEGEND

- LEMON LANE LANDFILL BOUNDARY
- PROPERTY BOUNDARY
- EXPOSED CAPACITORS
- LIVESTOCK FENCE
- GEOLOGIC CROSS SECTION
  - Groundwater Elevation
  - a. October 27, 1982
  - b. December 14, 1982
  - c. March 12, 1983
  - d. April 12, 1983
- INFERRED GROUNDWATER FLOW DIRECTION

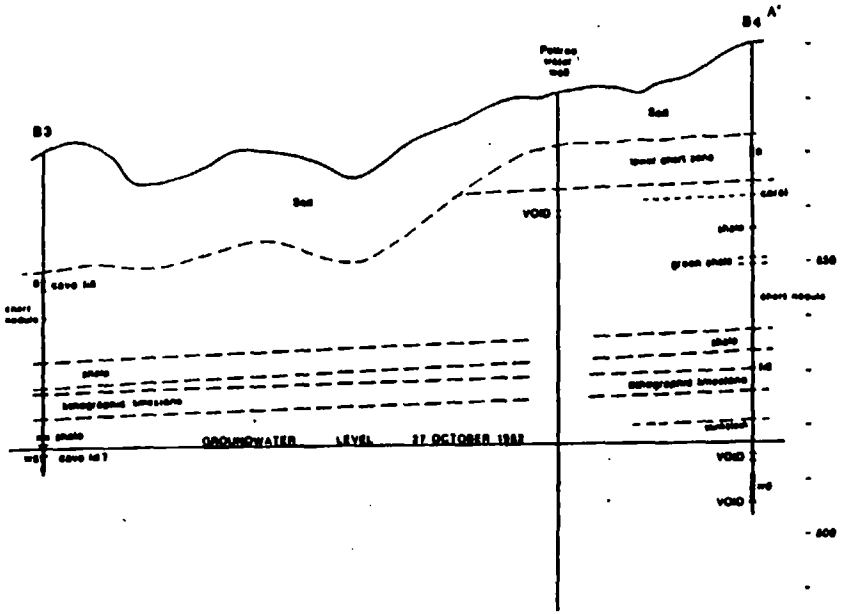
NOTE: Groundwater elevations are measured relative to a local bench mark.

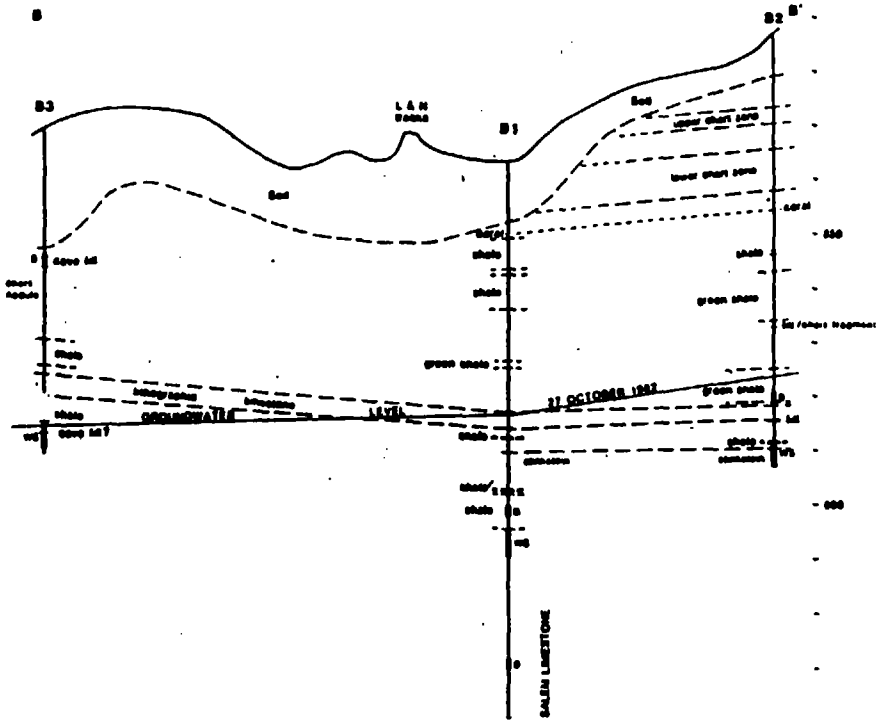
N

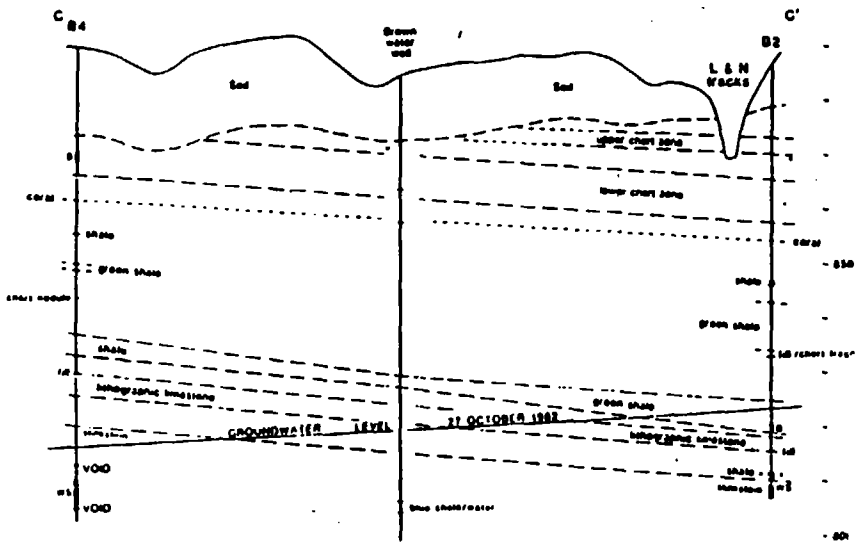
0 200 400

SCALE IN FEET

FIGURE 2-6
GROUNDWATER ELEVATIONS
LEMON LANE LANDFILL







HORIZONTIAL SCALE
300'

VERTICAL SCALE
30'

SOURCE: Geologic Cross Sections at Lemon Lane Landfill, Ecology and Environment, Inc.

NOTE: Soil profile generalized from boring data. Altitudes in approximate feet above sea level.

FIGURE 2-7
GEOLOGIC CROSS SECTIONS
LEMON LANE LANDFILL

and interbedded with the limestone. Numerous solution features and core loss zones were indicated.

Soil in the area of the site was identified from the four monitoring well borings. It is primarily weathered limestone overlying limestone bedrock. It varies from approximately 7 to 20 feet in thickness and it is characterized as a reddish brown silty clay with traces of limestone fragments.

Soil Sampling

Onsite soil was sampled by the ISBH, U.S. EPA and the City of Bloomington in June and July of 1981 (see Figure 2-2). All samples have been reported to contain PCB's, ranging from 0.1 mg/kg to 330,000 mg/kg (Table 2-2). U.S. EPA samples were also analyzed for the full CLP organic priority pollutant package. No other priority pollutants were reported at detectable levels.

Soil sampling offsite has been conducted by the City of Bloomington at the property of Leon Mullis and in two wooded depressions either side of the Illinois Central Gulf Railroad (See Figure 2-1). One of the two samples from the Mullis property was reported to contain 3,500 mg/kg of PCB. This sample was from a junk disposal site north of the residence. Five samples were taken in the wooded depressions southeast of the site (Figure 2-8). The depressions flood during periods of wet weather from a combination of surface runoff and spring flow. All samples were reported to contain PCB's, ranging from 0.2 to 360 mg/kg, (see Table 2-2).

2.4.3 Hydrology

Monroe County lies between the two forks of the White River which receive all the drainage waters of the county (USDA

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Table 2-2
SOIL SAMPLE RESULTS
LEMON LANE LANDFILL
W65129.00

SAMPLER	SAMPLE DATE	SAMPLE LOCATION	DEPTH	PCB MG/KG
Indiana State Board of Health	6/22/81	I-A	Surface	330,000[a]
		I-B		1,700[b]
City of Bloomington	6/22/81	B-1	Surface	69,160
		B-2		28,118
U.S. EPA and ISBH	6/30/81 to 7/1/81	E-1	Surface	5.6
		E-2	1'	0.37
		E-3	3'	0.39
		E-4	5'	0.1
		E-5	1'	2.67
		E-6	3'	0.11
		E-7	5'	0.78
		E-8	Surface	1,550
		E-9	Surface	57,000
City of Bloomington[c]	7/23/81		Surface	3,500
				0
City of Bloomington[d]	2/22/82	B-A	Surface	0.2
	2/22/82	B-B		4.5
	2/23/82	B-D		9
	2/26/82	B-C		360
	2/26/82	B-E		65

[a] Aroclor 1242.
[b] Aroclor 1248.
[c] Samples taken at the Leon Mullis residence, see Figure 2-1.
[d] See Figure 2-8 for sample locations.

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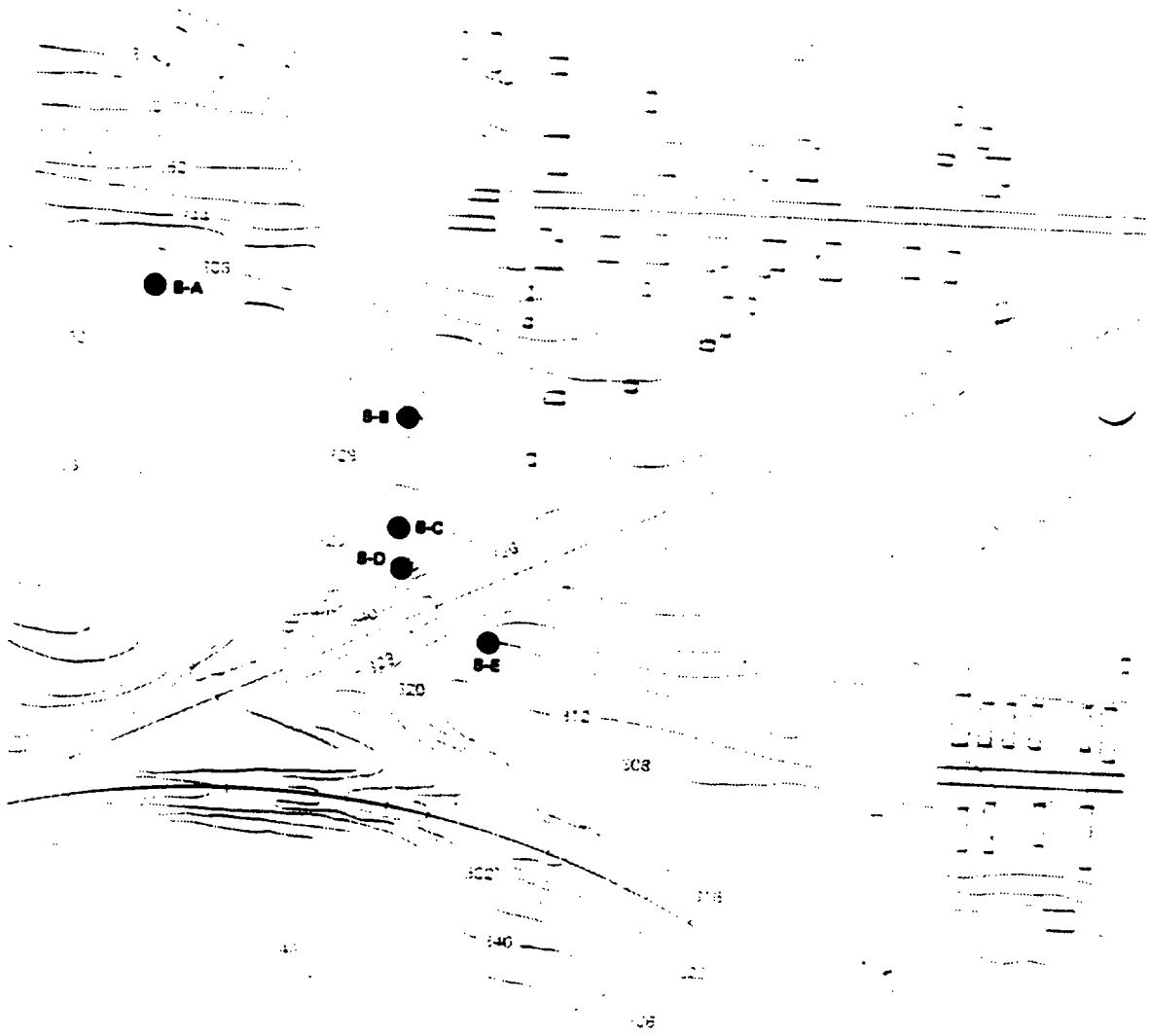

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● SAMPLING LOCATIONS

N

0 200 400

SCALE IN FEET

FIGURE 2-8
SOIL SAMPLE LOCATIONS
AT WOODED DEPRESSIONS
LEMON LANE LANDFILL

1981). Average annual runoff is estimated at 10 to 15 inches for the area with the peak annual runoff occurring in March. High stream flow also occurs in March and low stream flow in October (Geraghty, et al., 1973).

Some creeks in the area have underground tributaries which drain sinkholes and surface as springs (see Figure 2-1). Seven springs emerge north and northwest of the site and flow northward to Stouts Creek. Two springs northeast of the site flow northeast to Griffy Creek downstream of the Griffy Creek Reservoir. Two springs to the southeast flow southward to Clear Creek. South-southwest of the site two springs flow into Twin Lakes. These lakes have no overland discharge.

Surface Water and Sediment Sampling

Surface water and sediment PCB analytical results are summarized in Table 2-3. Sampling locations are identified on Figure 2-9. With the exception of the spring located north of Twin Lakes (F1), reported PCB contamination is confined to the pond northwest of the site and the spring and runoff water in the area of the wooded depression southeast of the site.

Priority pollutant analysis was conducted for FIT samples taken in July and December of 1982. A summary of the organic analyses for these samples is presented in Table 2-4. Trichloroethene, trichloromethane, 1,1, dichloroethene, fluorotrichloromethane, and tetrachloroethene were found in concentrations exceeding EPA ambient water quality criteria for the protection of human health against carcinogenicity (at the 10^{-5} risk level). Inorganic constituents were also found in the surface waters, but were within ranges expected for the Bloomington area.

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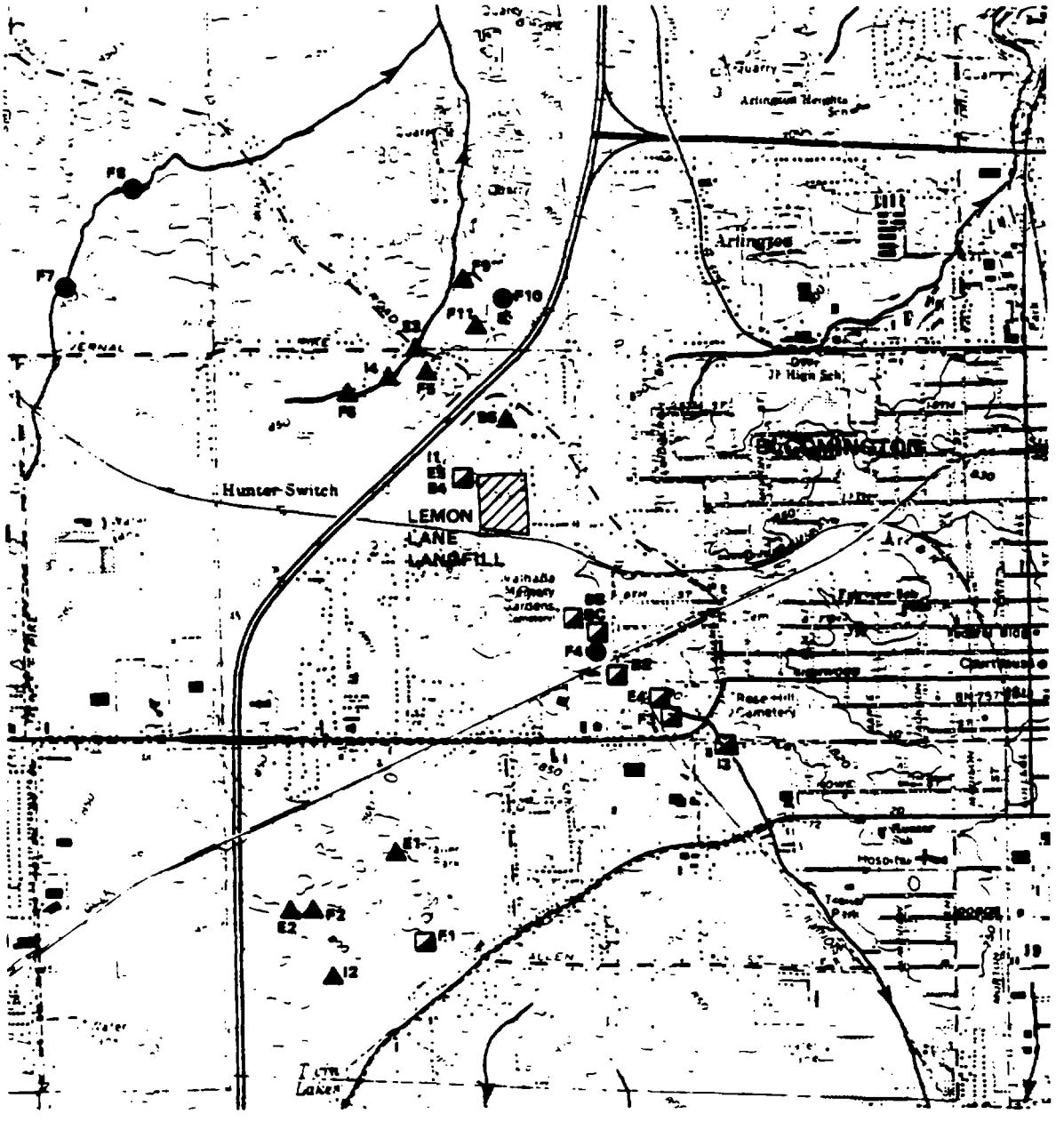
Table 2-3
SURFACE WATER AND SEDIMENT PCB
SAMPLE RESULTS (ppb)
LEMON LANE LANDFILL
W65129.00

Sampler	Sample Date	Sample Location	Sample Type	PCB[b] (ppb)
ISBH, EPA	7/1/81	I-1	Water	0.9
			Sediment	520
ISBH	8/17/81	I-2	Water	< 0.1
		I-2	Sediment	< 0.1
		I-3	Water	5.7
		I-4	Water	< 0.1
EPA, ISBH, ISGS	10/8/81	E-1	Spring	< 0.1
			Sediment	< 0.1
		E-2	Spring	< 0.1
			Sediment	< 0.1
		E-3	Spring	< 0.1
			Sediment	< 0.1
		E-4	Spring	6.8
			Sediment	500
Bloomington	2/22/82	B-B	Water	18
	2/26/82	B-C	Water	18
	2/19/82	B-E	Water	1
	a	B-4	Water	< 0.1
	a	B-5	Water	< 0.1
	a	B-6	Water	< 0.1
	a	B-7	Water	< 0.1
FIT, EPA	7/28/82	F-1	Spring	< 0.1
		F-2	Spring	< 0.1
		F-3	Dry	
		F-4	Spring	< 0.1
		F-5	Dry	
		F-6	Spring	< 0.1
		F-7	Spring	< 0.1
		F-8	Spring	< 0.1
		F-9	Spring	< 0.1
		F-10	Spring	< 0.1
		F-11	Spring	< 0.1
			Blank	< 0.1
EPA	10/19/82	E-5	Water	< 0.1
FIT, EPA	12/9/82	F-1	Spring	1.85
		F-2	Spring	< 0.1
		F-3	Spring	2.7
		F-4	Spring	12.2
		F-5	Spring	< 0.1
		F-6	Spring	< 0.1
		F-7	Spring	< 0.1
		F-8	Spring	< 0.1
		F-9	Spring	< 0.1
		F-10	Spring	< 0.1
		F-11	Spring	< 0.1

[a]Data not available for RAMP.
[b]EPA Water Quality Criteria for ingestion of water and organisms at the 10-5 risk level for carcinogenicity is 0.00079 ppb.

GLT418/12



LEGEND

- ▲ SAMPLE LOCATION
- ◪ SAMPLE LOCATION WITH REPORTED PCB CONTAMINATION
- ● SAMPLE LOCATION WITH OTHER REPORTED ORGANICS ABOVE EPA WATER QUALITY CRITERIA

FIGURE 2-9
SURFACE WATER AND SEDIMENT SAMPLING LOCATIONS
LEMON LANE LANDFILL

DRAFT

Table 2-4
SPRING SAMPLE ORGANIC ANALYSIS RESULTS (ppb)
LEMON LANE LANDFILL
W65129.00

Compound Detected	EPA WQC	E5	F1		F2		F3	F4		F5	F6		F7		F8		F9		F10		F11	
		10/82	12/82	07/82	12/82	07/82	12/82	12/82	07/82	12/82	12/82	07/82	12/82	07/82	12/82	07/82	12/82	07/82	12/82	07/82	12/82	07/8
Methylene Chloride	1.9[c]	11		11		11																
Chloroform	1.9[c]		--																			
PCB 1248	.00079[c]		1.85				2.7	12.2														
1,2 Transdichloroethene	a							6.6	31				6.0	206								
Trichloroethene	27[c]						15	41					8.1	45								
Acetone	a							--														
Trichloromethane	4[c]							720[b]							740[b]							
Cyclohexane	a							2900[b]							3000[b]							
1,1,1-Trichloroethane	18,400[d]							40					59	110	12							
1,1 Dichloroethene	0.33[c]												7.2	16								
Fluorotrichloromethane	1.9[c]												42	--	8.6				5.7	20		
Tetrachloroethene	8[c]												7.4	32								
3-Ethylhexane	a												6.9[b]									
3,5-Dimethylheptane	a												8.3[b]									5.7
4-Hydroxy 4-Methyl, 2-Pentanone	a												26[b]		20[b]		44[b]					
1,3-Dimethylbenzene																	12[b]					
Diethylphthalate	350,000[d]																					
Bis(2-Ethylhexyl) Phthalate	15,000[d]						44				16											
Di-n-Butyl Phthalate	34,000[d]		--				--															
Hexahydro-2H-Azepin -2-One	a		24[b]																			
1-Hexadecenoic Acid	a		130[b]																			
3,2,2-Methylester-9, 12,15 Octadeca-Trienoic Acid	a		117[b]																			

Blank Indicates compound not detected.
-- Less than specified detection limit.
[a] No criteria set.
[b] Tentatively identified.
[c] 10^{-5} risk level for carcinogenicity.
[d] Level for toxicity.

GLT418/20

2.4.4 Hydrogeology and Groundwater Quality

Groundwater flow in the St. Louis formation is controlled by the joints and other fractures in the rock. Rainfall and other surface water is concentrated at the sinkholes which in turn are connected with the near vertical joints. The water flows vertically through these joint sets until it encounters a fracture or solution feature that carries it horizontally. This flow may exit a hillside as a spring or continue following solution features down to the groundwater table.

At the site, the groundwater table appears to be located in the lower half of the St. Louis formation. This area appears to be characterized by voids, vugs, zones of infilling, broken rock, and solution features. A shale layer of varying thickness was encountered in the borings, but it is above the water table and does not appear to be acting as a confining layer.

Groundwater elevations were measured at four monitoring wells surrounding the site in October 1982 through April 1983 as a part of FIT activities (see Figure 2-6). The direction of groundwater flow in the immediate region as implied by the measurements taken are as follows.

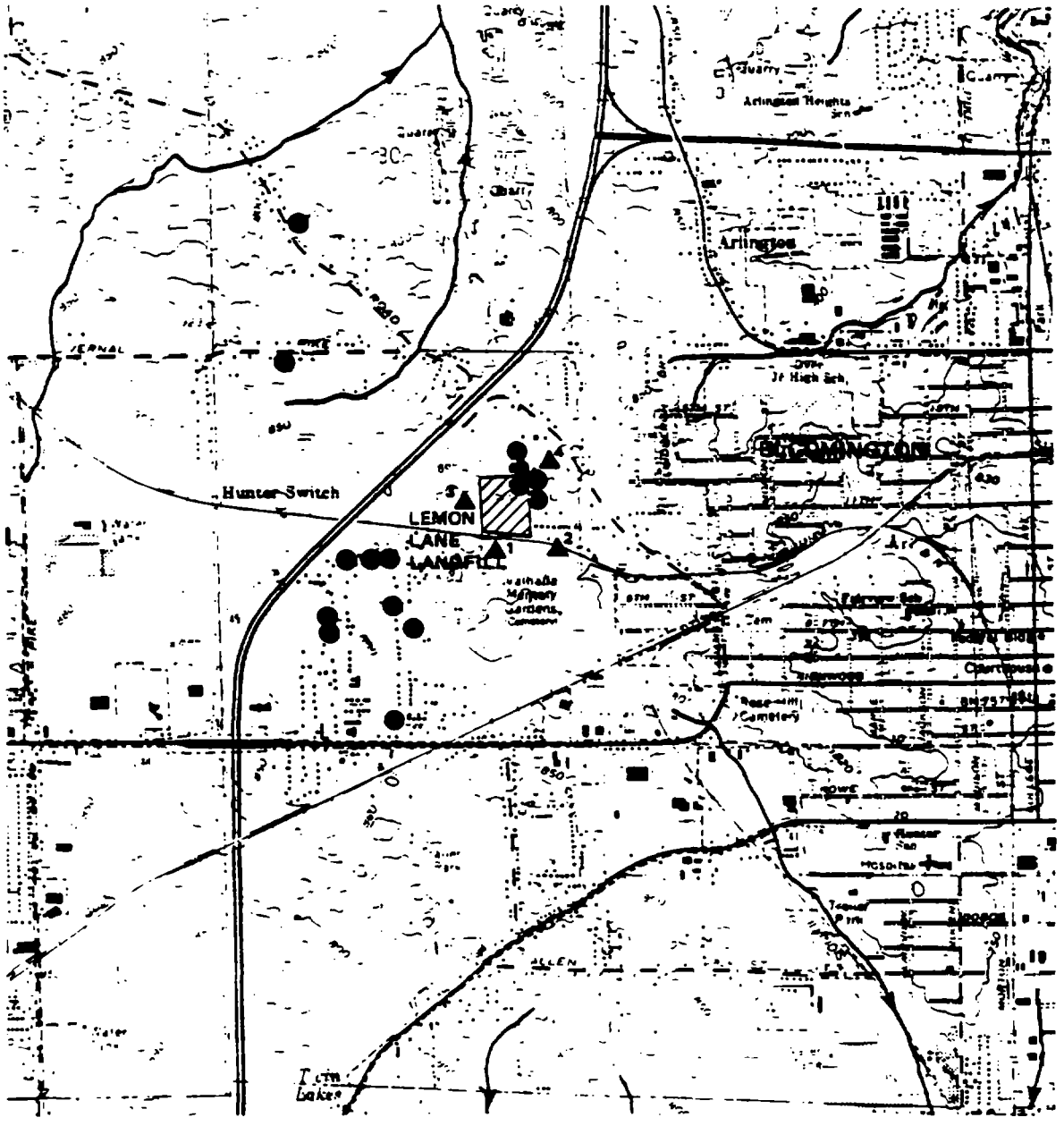
October 27, 1982	-	Southwest
December 14, 1982	-	Southwest
March 16, 1983	-	Southwest
April 12, 1983	-	Northeast

Groundwater monitoring in the area is limited to four monitoring wells and residential wells. Sampling dates and locations are listed in Table 2-5. Approximate monitor well locations are shown on Figure 2-10. All but two residential wells are

Table 2-5
GROUNDWATER SAMPLING
LEMON LANE LANDFILL

Sampler	Sample Date	Sample Location
Residential Wells		
Bloomington	6/25/81	800 Lemon Lane 825 Lemon Lane 835 Lemon Lane 828 Lemon Lane 121 S. Johnson 220 N. Johnson 315 N. Johnson 2520 Evergreen 2416 Evergreen 2424 Evergreen 215 N. Kimble 211 N. Kimble 3730 Stouts Cr. Rd. 3701 Stouts Cr. Rd. 2411 Curry Pike 3500 Woodyard Rd.
EPA, ISBH	7/2/81	800 Lemon Lane 825 Lemon Lane 835 Lemon Lane
EPA, FIT	7/2/81 10/7/81	315 N. Johnson 2416 Evergreen
Monitoring Wells		
EPA, FIT	10/19/82	B1 B2 B3 B4

GLT418/13



LEGEND

- ● RESIDENTIAL WELL
- ▲ MONITORING WELL

NOTE: 3 Residential wells located off this map to the northwest.

0 4000

2000

SCALE IN FEET

FIGURE 2-10
RESIDENTIAL WELL AND MONITORING WELL LOCATIONS
LEMON LANE LANDFILL

located within a 3,000 foot radius of the site. No groundwater samples from monitoring or residential wells are reported to contain PCB's; however, other organic and inorganic compounds were found in the monitoring wells (Table 2-6). The levels of trichloroethene and methylene chloride in well B-1 exceed the EPA water quality criteria for carcinogenicity at the 10^{-5} risk level. All monitoring wells contained lead at levels above that specified for the protection of human health against toxicity in EPA ambient water quality criteria. The blank sample analyzed at the same time also contained high levels, thus, the lead results are suspect.

2.4.5 Air Quality

Climate

A summary of annual temperature and precipitation in Bloomington is contained in Table 2-7. Sunshine is expected 70 percent of the time in the summer months and 45 percent during the winter (USDA 1981). Air temperatures might exceed 80°F an average of 900 to 1,400 hours per year (Geraghty, 1973). Wind is predominantly from the southwest although winds out of the west or northwest sometimes occur during winter.

Site Air Quality

The only known air quality measurements were recorded during the April 29, 1983, site visit. Measurements were made with an HNU photoionization detector. Measurements of organic vapors below background levels were not recorded onsite; however, site visit members detected "sweet" odors in the southwest area of the site. The weather during the site visit was sunny, approximately 65°F with a light wind out of the west.

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Table 2-6
GROUNDWATER SAMPLE RESULTS (PPB)
LEMON LANE LANDFILL
October 19, 1982
W65129.00

	EPA WQC	B1	B2	B3	B4	B4	Blank
Organics Detected							
Bis(2 Ethylhexyl) Phthalate	15,000[d]	--	--	--			--
1,2 Trans-Dichloroethene	[a]	--	--				
Methlene Chloride	1.9[c]	11	--				--
Trichloroethene	27[c]	61					
Napthalene	[a]		--				
Di-N-Butyl Phthalate	34,000[d]		--				--
Benzyl Butylphtalate	[a]			--			
Chloroform	1.9[c]						--
Hexahydro-2H-Azepin-2-One	[a]	203[b]	24[b]		2,101[b]	445[b]	
Dodecanoic Acid	[a]		23[b]				
5,5, Trimethyl-1-Hexanol	[a]		48[b]		179[b]	118[b]	
Nonadecanol	[a]		22[b]				
Sulfermol	[a]		14[b]			22[b]	
Heptadecane	[a]				16[b]		
Heneicosane	[a]				20[b]		
2-(2-Chlorethoxy) Ethanol	[a]				27[b]		
Inorganics Detected							
Chromium	170,000	22	19	21	24		
Iron	[a]		103	75			
Manganese	[a]	49	27	19	21		
Zinc	[a]	5,860	3,800	1,240	1,420		
Cadmium	10	8	3	3	4		
Lead	50	165	182	156	168		134

Blank indicates compound not detected.
-- Less than specified detection limit.
[a] No criteria set.
[b] Tentatively identified.
[c] 10^{-5} risk level for carcinogenicty.
[d] level for toxicity.

Table 2-7
TEMPERATURE AND PRECIPITATION
LEMON LANE LANDFILL
W65129.00

Month	Average Daily Temperature (°F)	Precipitation[a]		
		Average Precipitation	Average Number of Days with 0.10 Inch or More of Precipitation	Average Snowfall (Inches)
January	30.3	2.87	6	2.4
February	33.2	2.61	6	2.4
March	41.6	3.92	9	.1
April	54.8	3.80	8	.6
May	64.4	4.40	9	.0
June	72.4	4.41	8	.0
July	76.2	4.47	7	.0
August	74.4	3.35	5	.0
September	68.3	3.42	5	.0
October	57.3	2.31	5	.0
November	44.2	3.38	7	.7
December	33.4	3.40	8	1.5
Year	54.2	42.34	83	7.7

[a]Recorded in the period 1951-75 at Bloomington, Ind.

GLT418/14

2.4.6 Ecology

Pastures are located to the west and northwest of the site. These lands can provide habitat for open land wildlife which may include pheasant, meadowlark, field sparrow, cottontail and red fox.

A woodland is located one-half mile southwest of the site. Upland oak, tulip poplar, black walnut and pin oak are the principal woodland crops in the county. Woodland wildlife include ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, racoon, and white tailed deer.

Surface waters within one-half mile of the site include intermittent streams and springs located to the west, northwest, northeast, southeast and southwest of the site and sinkhole ponds to the north and northwest of the site. PCB contaminated fish have been found in Stouts Creek and Clear Creek, though it is believed that this contamination is from other PCB sources in the area.

2.4.7 Socioeconomics

The population of Bloomington has grown from 42,890 in 1970 to 53,000 in 1980. Major industry in the City includes light industry associated with RCA, General Electric, Westinghouse, and B.F. Goodrich. Limestone quarry operations are located primarily south and west of the City but not all quarries are active. Bloomington is not considered a farming community but some pasture lands are located in the area. The University of Indiana campus is located 2 miles east of the site.

The site is adjacent to a residential neighborhood to its east and is within 1,000 feet of a residential neighborhood

to the southwest. Approximately 300 residences are located within 2,000 feet of the site.

2.5 ASSESSMENT OF POTENTIAL IMPACTS

2.5.1 Public Health and Safety

PCB's and possibly other chlorinated byproducts of PCB combustion are the hazardous substances of major concern at the LLL site. PCB's in the environment can be a health hazard as the compounds are not degradable and can migrate over a variety of routes and pose a threat through ingestion, inhalation or direct contact. Accidental ingestion and dermal exposure to PCB's have been known to cause a number of disorders in humans. Among the symptoms reported are the following, (Nemerow, 1978, James, et al., 1981):

- Inclusion and chloracne cysts
- Eye discharge
- Weakness and vomiting
- Abnormal menstrual cycles
- Intestinal disturbances
- Weight loss
- Skin lesions
- Brown pigmentation of skin, nails, and gums in newborns
- Still births
- Decreased growth in males
- Swelling of livers and jaundice
- Decrease in immunosuppression

Long-term effects of PCB exposure are unknown; however, symptoms of exposure have been documented to be present in some cases five years after exposure (Nemerow, 1978). EPA water quality criteria for carcinogenicity protection via ingestion

of water and organisms is 0.00079 ug/l at the 10^{-5} risk level.

Soil Contamination

A public health hazard is posed by the Lemon Lane Landfill site due to the potential exposure to PCB's by direct contact with contaminated soils. Contamination by direct contact is a very likely problem at the LLL site. According to local residents, children regularly play on the site grounds. As evidence of this fact, footpaths exist throughout the site. Also, bicycle tire marks have been seen onsite.

The wooded depressions southeast of the site also display evidence of activity by children. Footpaths can be found in the wooded area north of the tracks. A platform constructed of old railroad ties and a "fort" are located south of the tracks.

The potential for exposure of children will increase as the weather becomes warmer and children begin playing outside. Also, the school vacation will result in much more outdoor activity by local children.

Bioaccumulation of PCB's is a concern in wild game such as rabbits, quail and pheasants. Rabbits, in particular, could pose a health threat as they are reported to be hunted for consumption onsite and in the surrounding areas offsite.

Air Contamination

Although air contamination at the site has not been documented, the possibility of air blown transport of PCB's or other chlorinated compounds exists. The presence of a residential

neighborhood immediately east and downwind of the site causes this to be a public health hazard.

Groundwater Contamination

Groundwater contamination at the site has not been reported to date, but is a possibility. The location of the landfill over sinkholes enhances the potential of groundwater contamination. The tendency for water to flow along rock fractures and solution features may tend to isolate groundwater contamination in narrow zones, thus making detection with monitoring wells difficult. At least 12 residential wells are located within one-half mile of the site.

Surface Water Contamination

The spring fed creeks in the area of the site flow to larger streams to the north and south which support game fish. Surface water contamination is a health hazard due to the potential for PCB bioaccumulation in game fish. The reported PCB contaminated pond northwest of the site and the runoff waters and spring in the wooded depressions southeast of the site are also a concern due to the potential for bioaccumulation of PCB's. The pond is used for watering the livestock in the pastures west of the site. The spring southeast of the site is also used for watering livestock grazing nearby. Bioaccumulation of PCB's in the livestock could result in later health hazards to consumers.

2.5.2 Environment

The EPA Ambient Water Quality criteria for protection of aquatic life from the toxic properties of PCB's is 0.014 ppb. The lowest reported toxic concentration for freshwater aquatic life is 2.0 ppb (acute) (EPA, 1980).

Physiological effects on organisms caused by PCB exposure or ingestion include the following (Nemerow 1978, James 1981).

- o death of lower invertebrates
- o swelling of livers in various species
- o enzyme system disturbances in various species
- o growth inhibition in hampsters
- o decrease in immusosuppression in birds and mammals
- o hyperkeratosis, erethyma, blisters and desquamation in rabbits
- o inhibition of photosynthesis and growth of algae

The fact that PCB's will bioaccumulate in animal tissues is of particular concern as the contaminant will remain in the food chain. PCB concentration will biomultiply without being degraded or eliminated and can reach levels which may be toxic to those organisms at the top of the food chain.

2.5.3 Socioeconomics

The presence of a hazardous waste in a community where surface water bodies, soils, and a potable aquifer could become contaminated may cause socioeconomic impacts. These might include the following:

- o loss of cattle for human consumption
- o decline in property values
- o depressed area growth
- o reduction in recreational activity
- o expenditures for laboratory analysis of area water, soil, and biota samples
- o expenditures for medical services

2.6 DATA LIMITATIONS

It is believed that the City of Bloomington and Westinghouse are sampling and testing groundwater from approximately 12 monitoring wells on a regular basis. Monthly residential well sampling and analysis and spring sampling and analysis are also believed to be occurring. The data generated from these investigations have not been made available for this RAMP.

Available data are limited in the following regard:

- Data being collected as part of a court suit between the City of Bloomington and Westinghouse Corporation were not available for inclusion in the RAMP.
- Due to the possibility of channelized groundwater flow, contaminated groundwater may be restricted to narrow zones. Groundwater monitoring by EPA is limited to four wells immediately offsite. Contaminated groundwater may, therefore, be undetected.
- Sampling to date has not firmly defined the exact contaminated surface water and sediment or migration pathways.
- The areal distribution and depth of contaminated soil has not been established. Locations of additional "hot spots" onsite or offsite have not been fully established.
- Air quality at the site is undefined.
- Presence of buried capacitors onsite and offsite has not been investigated.

- Bioaccumulation of PCB's in wildlife and cattle has not been analyzed.

- Topographic data is limited.

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GLT418/11

3.0 REMEDIAL ACTION PLANNING

3.1 REMEDIAL ACTION PLAN

3.1.1 Overall Approach to Site

Remedial actions are developed for the site in accordance with the NCP and include:

- Initial remedial measures
- Source control remedial actions
- Offsite remedial actions

Since the existing data are inadequate to characterize the site and to develop and evaluate solutions for source control or offsite remedial actions, a remedial investigation/ feasibility study is warranted and necessary to fill in gaps in the existing data.

3.1.2 Master Site Schedule

The master site schedule for the Lemon Lane Landfill site is shown in Figure 3-1. The project is assumed to begin immediately after receipt of the work assignment.

3.2 INITIAL REMEDIAL MEASURES

3.2.1 Objective

The baseline initial remedial measures (IRM's) recommended below are considered feasible and necessary to limit exposure or threat of exposure to a significant health hazard from the Lemon Lane Landfill site. They are consistent with the ~~following~~ requirements of Section 300.68(e)(1)(i) of the

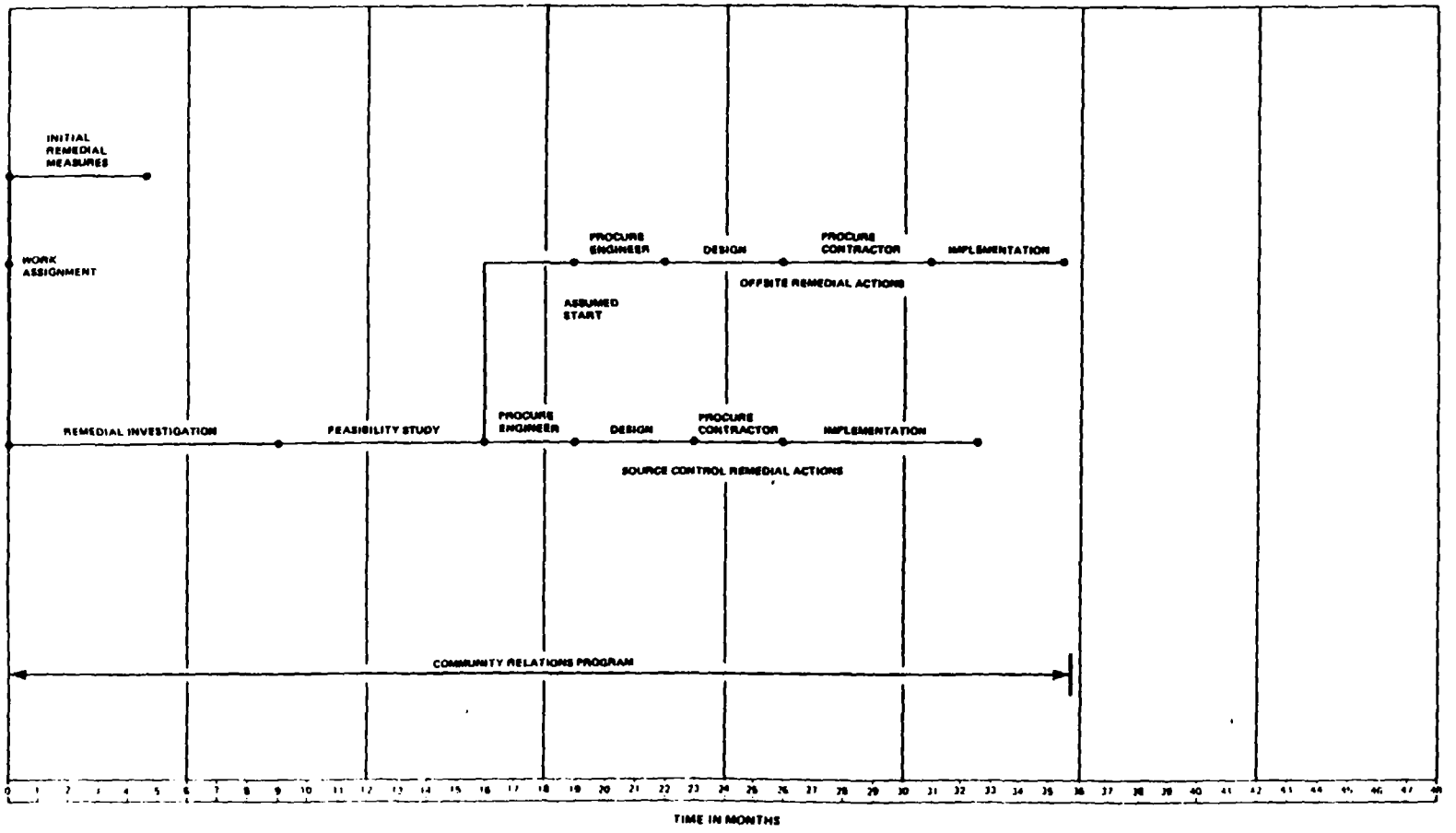


FIGURE 3-1
MASTER SITE SCHEDULE
LEMON LANE LANDFILL

National Contingency Plan for the determination of whether IRM's are appropriate:

- o "Actual or potential direct contact with hazardous substance by nearby population."
- o "Highly contaminated soils largely at or near surface, posing a serious threat to public health or the environment."

As discussed earlier, hazardous substances in the form of PCB's in excess of 50 ppm have been found onsite and offsite (See Section 2.4.2). Potential direct or indirect contact with these hazardous substances by children and adults has also been shown (See Section 2.5.1). Also the potential for offsite migration of PCB's in soil erosion or wind blow dust has been discussed (See Section 2.5.1).

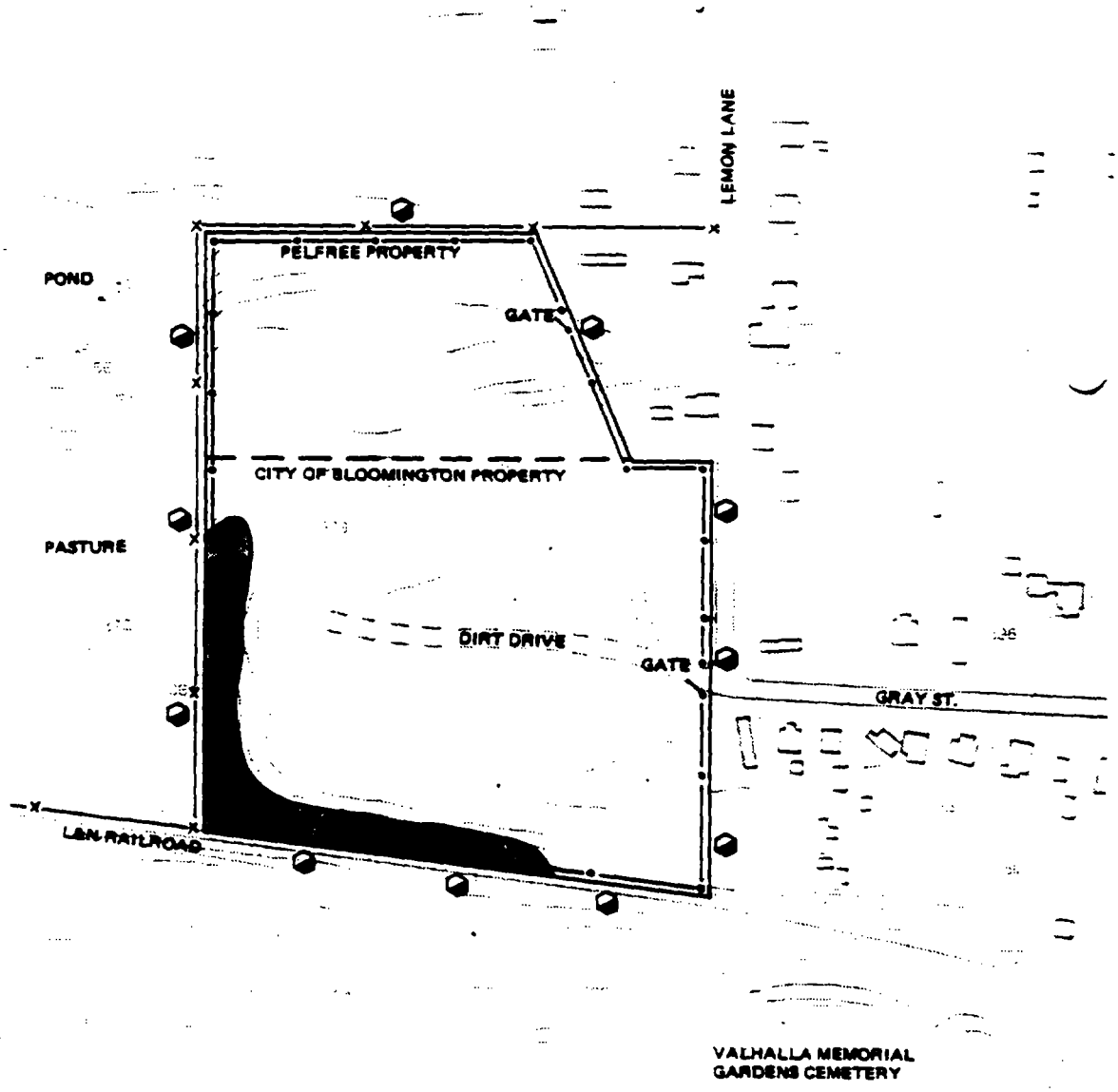
3.2.2 Recommended Actions

The following baseline IRM's are recommended:

Fencing and Placement of Warning Signs

The Lemon Lane Landfill site presently has a 4-foot, stranded wire livestock fence along the western and northern boundaries. The fence can be easily transgressed. It is recommended that the entire 10.7-acre site be fenced with a 6-foot chain link fence with three strands of barbed wire (Figure 3-2). Two locked gates will be provided: one at the present site entrance at the end of Gray Street and the other on the Pelfree property.

Eleven warning signs will be placed on the fence at approximately 200-foot intervals (See Figure 3-2). The signs will



LEGEND

- LEMON LANE LANDFILL BOUNDARY
- PROPERTY LINES
- EXPOSED CAPACITORS
- LIVESTOCK FENCE
- FENCE
- WARNING SIGN

N

0 400

200

SCALE IN FEET

FIGURE 3-2
FENCING AND WARNING SIGN LOCATIONS
LEMON LANE LANDFILL

state: "DANGER--UNAUTHORIZED PERSONNEL KEEP OUT" in 3-inch high letters. They will be constructed of galvanized steel with luminescent paint, and will be visible from a distance of 25 feet.

Installation of Impermeable membrane

In order to control migration of contaminants by airborne transport, percolation into groundwater or surface transport by runoff water, an impermeable barrier should be installed over the exposed capacitor area in the southwest corner of the site (Figure 3-3). Surface preparation measures will include grubbing the area of shrubs and brush, grading exposed surface area along the southwest boundary of the site for placement of the membrane and cover with a clean suitable fill. These measures are to protect the membrane and to assure that it remains in place until remedial actions are undertaken. An effort will be made to minimize the disturbance of existing soil.

Capacitors or other large objects laying on the surface will be relocated to a secure area on the landfill. They will be placed on an impermeable membrane and covered with polyethylene sheeting.

The cost estimate is based upon the following assumptions:

- Top 12 inches of existing soil will be graded
- Thirty mil hypalon impermeable membrane
- Cover will be provided locally
- Cover will be spread and compacted 6 inches above the membrane
- Grubbing, grading and cover will be performed by a local subcontractor

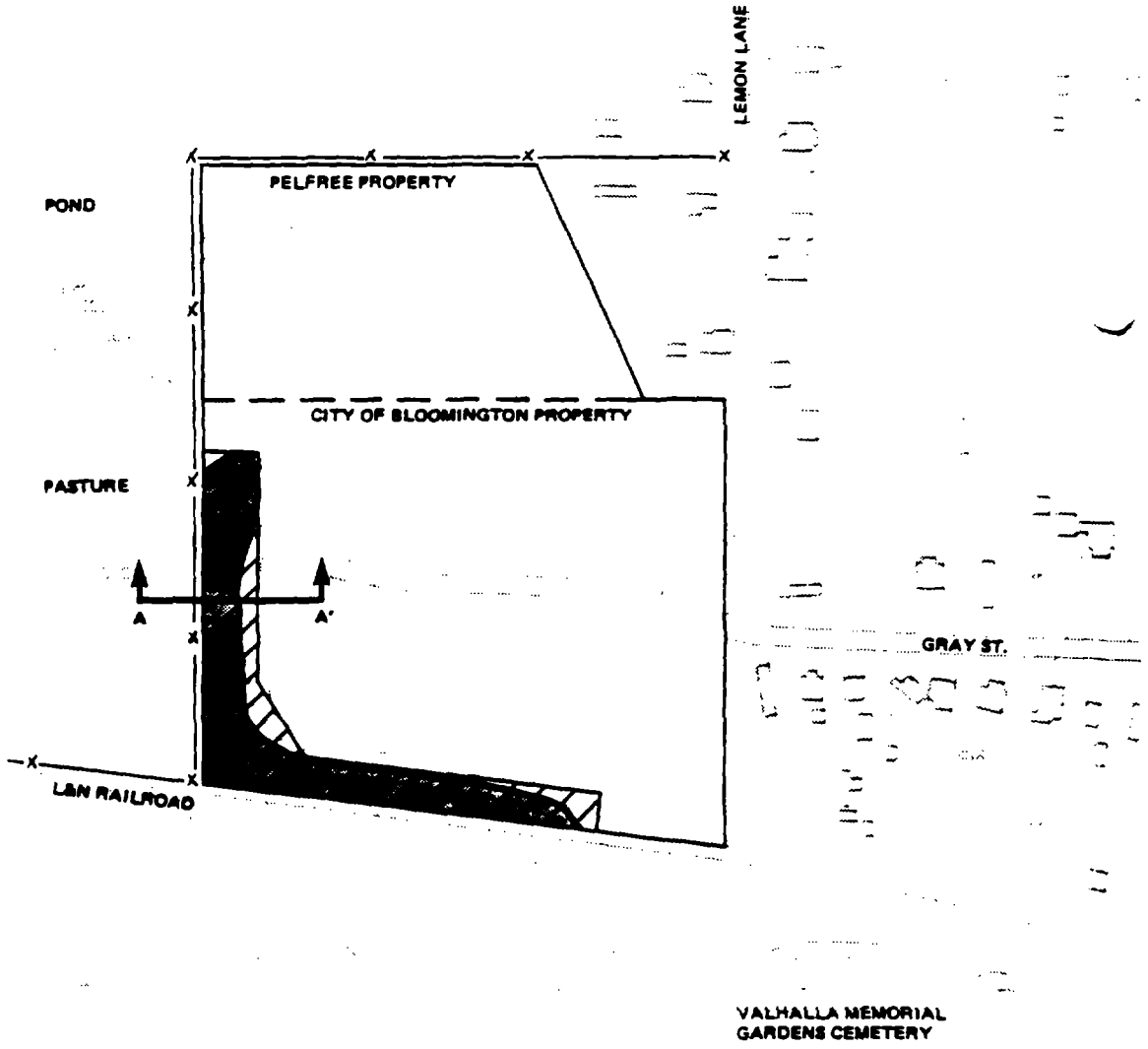


FIGURE 3-3
LOCATION OF
IMPERMEABLE MEMBRANE
LEMON LANE LANDFILL

The installation of the impermeable membrane will occur following soil sampling (Task 3-4) in the southwest area of the landfill.

Advisory Notice

It is recommended that an advisory notice be issued by the ISBH. The notice should be delivered door to door to residents living within one-half miles of the site. The notice should advise the residents as follows:

- Access control measures, such as fencing and a gate on the site access road are being implemented to prevent unauthorized site access.
- Contaminated soil still remains onsite.
- Studies will be undertaken to identify measures to cost-effectively reduce the level of remaining contamination.

The notice should also ask citizens to report locations of dumped capacitors or capacitor parts or areas where capacitors may have once been located.

Immediately following delivery and mailing of the advisory notice, a press release should be issued to announce and explain the intent of the advisory. The notice and press release should also announce a public meeting. The meeting will explain the present status of the site and answer citizen questions.

The cost estimate assumes that the advisory notice and press release will be issued by the ISBH. The contractor will

assist in the preparation of the notice and press release. No costs are included for the public meeting.

3.2.3 Cost Estimates and Schedule

The cost estimates and schedule for each of the IRM's are shown in Figure 3-4.

3.3 REMEDIAL INVESTIGATION/FEASIBILITY STUDY

3.3.1 Scope of Work

The scope of work proposed for the RI/FS follows.

Remedial Investigation Activities

- Preparation of work plan
- Site definition activities
- Detailed site characterization studies
- Remedial investigation report

Feasibility Study Activities

- Evaluation of remedial action alternatives
- Alternative remedial action feasibility report
- Conceptual design
- Project management activities

The four remedial investigation activities are discussed below. Sufficient data are not available to discuss feasibility study activities relative to the site. A generic discussion of these activities is included in Appendix C.

Activity 1 - Preparation of Work Plan

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Figure 3-4
IRM COST ESTIMATE AND SCHEDULE
LEMON LANE LANDFILL
W65129.00

Initial Remedial Measures	ESTIMATED COST Low($)	ESTIMATED COST High($)	SCHEDULE OF WEEKS 2	4	6	8	10	12	14	16	18	20
Fencing and Warning Signs for LLL	$25,800	$ 38,700	---------	———								
Installation of Impermeable Membrane	57,900	86,800				----------	----------	———	———	———		
Press Release	1,300	2,000		———								
TOTAL	$85,000	$127,500										

-------- Preparation of Contract Documents and Subcontractor Selection.

GLT418/8-1

This activity will refine the scope of work for the RI/FS discussed in this RAMP. It will develop a schedule and work plan to implement the recommended RI/FS activities.

Task 1-1 - Assemble Project Team. Upon receipt of the work authorization, a project team will be assembled. A kickoff meeting will be held between the RSPO and other agency personnel and appropriate members of the project team. The objectives of this meeting are:

- o Introduce respective team members
- o Discuss the overall project objectives and approach
- o Obtain relevant data
- o Discuss sensitive issues
- o Establish channels of communications and reporting

Task 1-2 - Gather and Review Background Data. During and following the kickoff meeting, available background data not collected during the RAMP will be obtained from the files of the EPA, FIT contractor, State, county, local and regional organizations and other pertinent sources. A request to obtain the data generated in the suit between the City of Bloomington and Westinghouse will be made to the court hearing the case.

All new data obtained will be reviewed on a preliminary basis due to the limited time available for preparation of the work plan. Remedial investigation tasks recommended in this RAMP will be revised as appropriate. Further data review will be accomplished during Task 2-5, Work Plan Update and Report, and subsequent site definition activities.

To provide a cost estimate, it was assumed that one trip to Indianapolis will be required to gather background data. During this trip, a site visit will also be completed by

team members who have not yet visited the site. The site can be viewed from the areas west and south of the site, eliminating the need for a site safety plan and safety equipment.

Task 1-3 - Prepare Quality Assurance Plan. A site-specific quality assurance (QA) project plan will be developed. The plan will include any other needs specific to the work assignment or requested by EPA as a result of extraordinary project requirements. A copy of the QA plan will be provided to appropriate EPA and State project personnel.

Task 1-4 - Identify Preliminary Goals and Objectives. The project team will identify preliminary cleanup goals and associated alternative remedial actions to assist in targeting the scope of investigations to be described in the work plan. These goals and options will be based on discussions with EPA and ISBH personnel. They will include observations from site visits, conclusions drawn from the readily available background data, and experience from other sites. The preliminary goals and alternative remedial actions will be reviewed with the appropriate agency personnel.

Task 1-5 - Work Plan. Based on the information obtained in Tasks 1-1 through 1-4, a draft work plan will be prepared and submitted for agency review following receipt of the work assignment. The final work plan will be submitted after receipt of written agency comments on the draft plan.

Activity 2 - Site Definition Activities

This activity will define the physical characteristics of the site and establish onsite health and safety facilities for use by all field personnel.

Task 2-1 - Prepare Site Health and Safety Assessment

The objective of the health and safety site assessment is to determine if there are portions of the site that present potentially hazardous chemical exposure levels in the air or soil. Such information will be useful in selecting and implementing remedial actions that provide local residents and remedial action investigators/workers with adequate warnings and safeguards. Before conducting the onsite assessment, available information on the site will be examined and reviewed to identify possible sources of hazardous air emissions and potentially hazardous areas.

In addition to the Lemon Lane Landfill site, the wooded depressions 1/2-mile southeast of the site will also be assessed. The reported PCB contamination in this area necessitates its inclusion in the health and safety assessment.

Trained personnel will conduct a thorough inspection of the entire landfill and the wooded depressions. They will use the appropriate monitoring equipment such as colorimetric chemical indicator tubes, a combustible gas indicator, an organic vapor analyzer and a photoionization detector. This equipment will be used to obtain sufficient data to render an evaluation of the potential for adverse health effects from chemical exposure levels in the area. A site health and safety plan for future site visits will be prepared from data generated in the assessment.

To provide a cost estimate, it was assumed that one trip to the site will be necessary for this task.

Task 2-2 - Site Safety Facilities. This objective of this task is to identify and provide site safety and decontamination facilities for the RI/FS activities.

A combination decontamination and office trailer will be supplied for site use by all field personnel, as required and identified in the health and safety plan. The facility will be supplied by a contractor on a rental basis or purchased, whichever is most cost-effective. Detailed specifications will be developed for space requirements, decontamination equipment, furnishings, and utilities (power, water, waste). The facility will include a secure waste material storage area for temporary storage of wastes generated during onsite work.

The cost estimate assumes that a trailer is needed for the duration of field activities.

Task 2-3 - Site Mapping. A topographic survey is recommended at the Lemon Lane Landfill site and the wooded depressions southeast of the site to create a site plan showing elevations and locations of all pertinent physical features (Figure 3-5). Such information is necessary for developing, screening and selecting remedial actions, as well as for the actual design and contracting of the remedial actions. Offsite areas are included in the mapping to allow for evaluation of surface drainage and possible offsite remedial actions.

The topographic survey will determine horizontal distances of appropriate physical features relative to the property boundary and vertical elevations relative to National Geodetic Vertical Datum of 1929 (NGVD).

A topographic map will be produced showing 1-foot contours with a scale of 1 inch = 50 feet. The maximum allowable horizontal error for any given point for a topographic map of this scale is 0.5 feet, and the maximum allowable accuracy of any individual elevation is 0.1 feet.

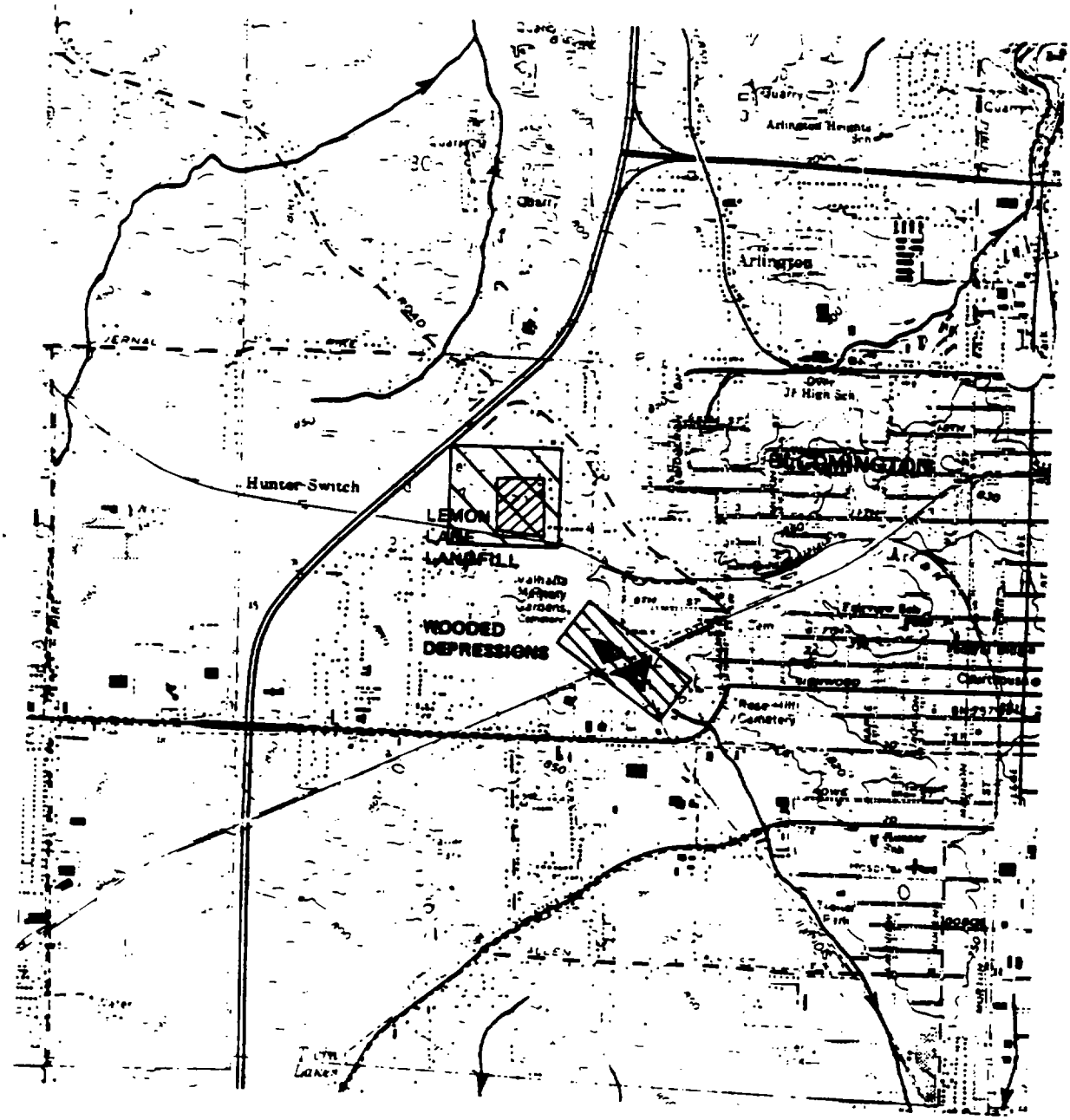


FIGURE 3-5
SITE MAPPING AREA
LEMON LANE LANDFILL

A legal description of the properties will be researched in Monroe County records and verified in the field. The intent is not to perform a property boundary survey, but to confirm boundaries so that subsequent remedial investigations and remedial measures will not carry over into neighboring properties without appropriate permission.

To provide a cost estimate for this task, it was assumed that the site is classified as Level D for health and safety and that aerial photography would be used to develop the topographic map. The cost estimate is based on a survey of 50 acres at Lemon Lane Landfill and 30 acres at the wooded depressions. It is also assumed that one trip would be required to the site.

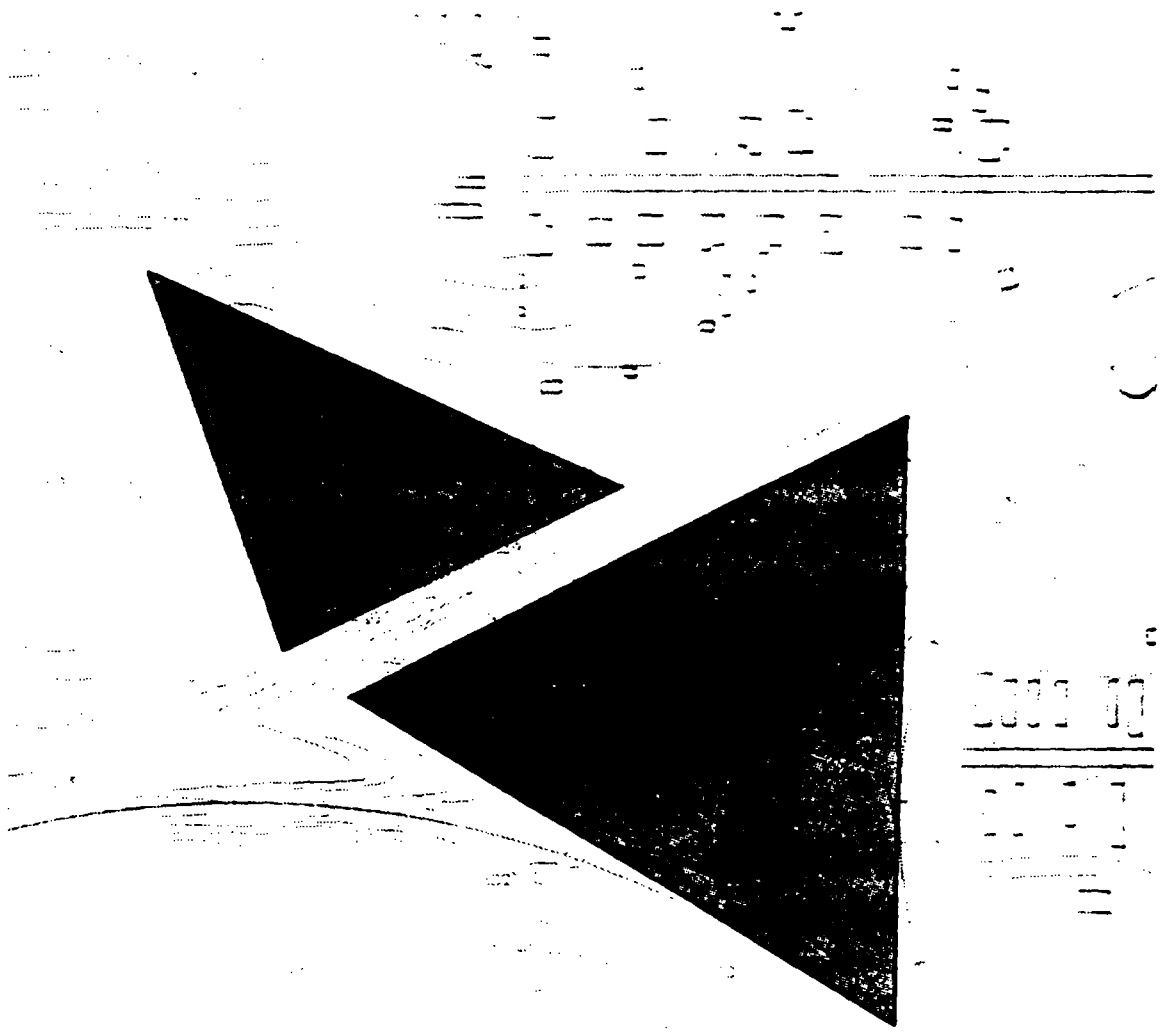
Task 2-4 - Survey for Buried Capacitors at the Wooded Depressions

As discussed in Section 2.5, Assessment of Potential Impacts, there is a possibility that capacitors from Lemon Lane Landfill were buried at the wooded depressions. Assuming that FIT soil sampling of these areas in late May of 1983 confirms the previously reported PCB levels, a magnetometer survey for buried capacitors is recommended (Figure 3-6).

Due to the relatively small size of a capacitor, it is possible that buried capacitors would not be detected at depths greater than 5 feet. Soil borings will be used to augment the magnetometer survey results (see Task 3-4).

The cost estimate assumes a magnetometer survey of 9 acres.

Task 2-5 - Work Plan Update and Report. Based on the data collected in Tasks 2-1 through 2-4, the work plan prepared in Task 1-6 will be reviewed and revised as needed to update



LEGEND

MAGNETOMETER SURVEY

N

0 400

200

SCALE IN FEET

FIGURE 3-6
SURVEY FOR BURIED CAPACITORS
AT WOODED DEPRESSION
LEMON LANE LANDFILL

the preliminary scope of work for the following activities. This activity will also include a review of electrical resistivity and electromagnetic survey methods to determine if these geophysical techniques could yield valuable data at the site.

A summary report will be prepared at the conclusion of the Site Definition Activities. Included will be the results of Task 2-1 through 2-4 and the work plan update. A copy will be provided to appropriate EPA and State project personnel.

Activity 3 - Detailed Site Characterization Studies

The following sections constitute a work plan for remedial investigations to obtain detailed site data for the Lemon Lane Landfill.

Task 3-1 - Residential Well Sampling. The objective of this task is to identify all residences using well water within a 1/2-mile radius of the site perimeter and to determine if any of the wells are contaminated with PCB's or other priority pollutants. Previous sampling of 16 residential wells by the City of Bloomington and EPA in 1981 did not indicate any PCB contamination. This sampling program is intended to determine if contaminant migration in the last 2 years has affected the wells previously sampled. Any additional wells identified within the 1/2-mile radius that were not previously sampled will also be sampled. Prior to sampling, well construction details, such as well depth, screening, well diameter and groundwater level, will be researched.

The scope of this task should be re-evaluated if data generated as part of the suit between the City of Bloomington and Westinghouse becomes available.

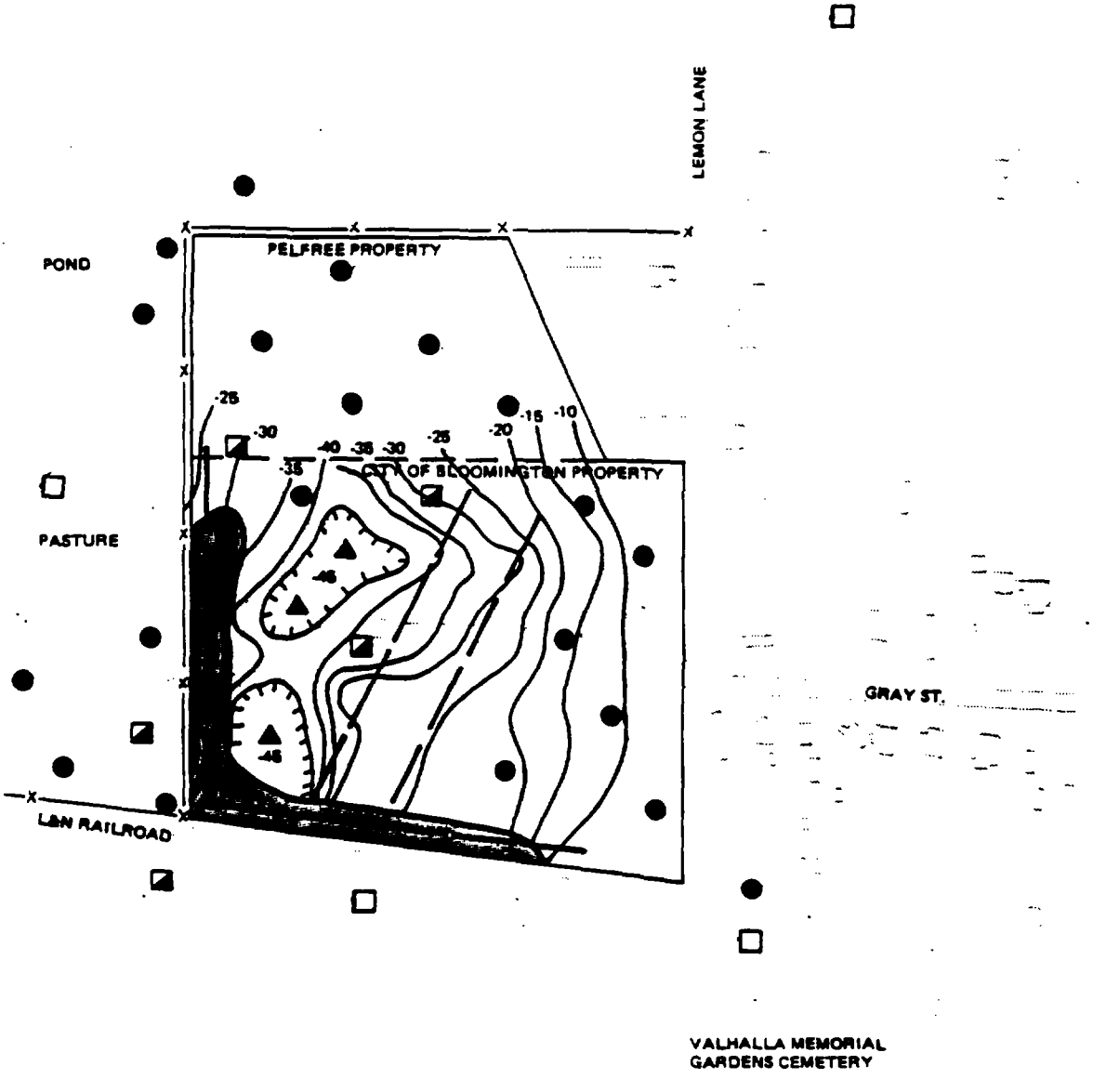
The cost estimate assumes 20 residential wells will be sampled. A total of 24 samples, including two blanks and two duplicates will be analyzed for the organic and inorganic analysis data package from the U.S. EPA Contractor Laboratory program (CLP). One sampling round is assumed for the cost estimate. Subsequent sampling should be conducted if contamination is found. Also, sampling beyond the 1/2-mile radius should be considered.

Task 3-2 - Installation of Additional Groundwater Monitoring Wells. The objective of installing additional monitoring wells is to:

- Provide hydrogeological data needed to evaluate groundwater flow conditions and to help guide potential future remedial actions.
- Provide a groundwater sampling program to detect any contaminants which may be present.

The previously completed hydrogeologic and geophysical investigations should be thoroughly reviewed for data on the geology of the site. Technical specifications and contract documents should be prepared for the drilling, casing, screen installation and development of monitoring wells. Bids should be obtained from qualified contractors before awarding a contract.

Five groundwater monitoring wells will be installed to an elevation of about 815 feet to define possible groundwater contamination just below the groundwater table. Approximate locations are shown in Figure 3-7. These locations were chosen because of their proximity to the main disposal areas on the site. The existing wells may not be close enough to the disposal areas to detect a contamination problem. The well locations were also chosen to line up with the northeast-southwest trending solution valley, which has been filled by



LEGEND

- LEMON LANE LANDFILL BOUNDARY
- PROPERTY LINES
- EXPOSED CAPACITORS
- LIVESTOCK
- BEDROCK CONTOURS
- SURFACE SOIL SAMPLE LOCATIONS
- DEEP SOIL BORING LOCATIONS
- LINE OF SOIL BORINGS DRILLED AT 80 FT. CENTERS
- SINKHOLE
- MONITORING WELL LOCATIONS
- EXISTING MONITORING WELL LOCATIONS

N

0 400

200

SCALE IN FEET

FIGURE 3-7
HYDROGEOLOGIC INVESTIGATIONS
LEMON LANE LANDFILL

the landfill operation. This solution valley possibly follows a zone of fractured rock which could be associated with faulting and which may transmit considerably more water than at the existing monitoring well locations.

Monitoring wells installed as part of the court suit are known to exist on and around the site. Information from these wells was not available at the time this RAMP was prepared. If this information is available prior to the preparation of the final work plan, the number of additional monitoring wells could possibly be reduced.

All drilling will be logged and inspected by a qualified hydrogeologist. Split spoon samples will be taken continuously down to the top of the rock. Rock core samples will be taken thereafter.

Monitoring wells may also be necessary at the wooded depressions southeast of the site, if buried capacitors are discovered during Tasks 2-4 or 3-4.

A report describing the well design and installation should be prepared to provide documentation of data obtained during the well installation program. These data include all boring logs, formation sample analyses, water level and top of casing elevations, and cross sections of the site.

The cost estimate for groundwater monitoring well installation at the site is based on:

- Five additional monitoring wells will be installed at about the 815-foot elevation.
- Two hundred-fifty (250) feet of drilling, casing and well installation will be performed.

- Twenty-five (25) samples will be analyzed for soil classification.

- All water used in the drilling process can be disposed of onsite. If this is impossible, all drilling water would have to be contained and disposed of in an acceptable manner at additional cost.

Task 3-3 - Groundwater Sampling and Analysis. Following installation, development, and stabilization of the groundwater monitoring wells, a groundwater sampling and analysis program should be conducted. The objective of the program will be to determine if any contamination exists near the disposal areas.

In addition to the five monitoring wells installed, the four existing monitoring wells will be sampled. Prior to collecting groundwater samples, the groundwater surface elevation will be measured at each well. All samples will be analyzed for the organic and inorganic analysis data package from the U.S. EPA CLP. One sampling round is assumed for the cost estimate. Subsequent sampling should be conducted if contamination is found.

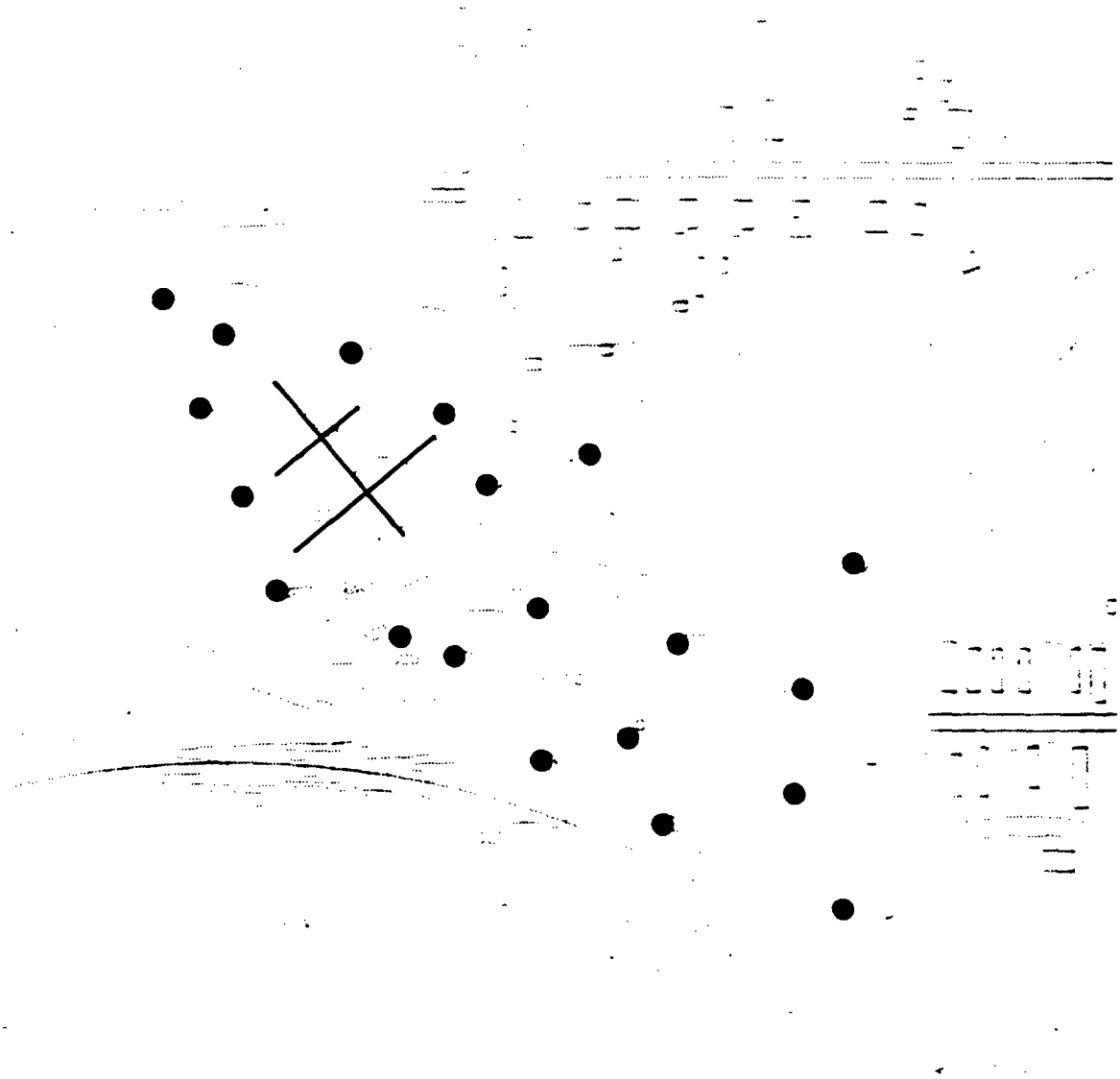
A report describing the groundwater sampling and analysis program should be prepared. The report should be updated as required to include the test results from each sampling event and to document the extent of contamination.

The cost estimate for groundwater sampling and analysis at the LLL site assumes nine monitoring wells will be sampled. A total of 13 samples including two blanks and two duplicates will be analyzed.

Task 3-4 - Soil Sampling and Analysis. The objective of sampling and analyzing soil is to collect data on the depth, areal extent and concentration of hazardous constituents. These hazardous constituents may be capacitors and capacitor parts, PCB contaminated soil or other hazardous substances identified from soil analysis. An extensive soil sampling and analysis program is proposed for the LLL site and the wooded depressions one-half mile southeast of the site. High PCB concentrations have been reported to exist at both locations.

Three deep soil borings are proposed to define the depth of rock at the old sinkhole locations at LLL (see Figure 3-7). These borings will also help define the degree of contamination and the thickness of landfill materials and native soil between the bottom of the landfill and top of rock. In addition to the three deep borings, a series of borings are to be drilled at 80-foot centers along the lines shown in Figure 3-7. These borings will be drilled to top of rock to define the degree of contamination and the thickness of landfill material and native soil throughout the rest of the site. In addition to samples obtained from the soil borings, surface soil samples will be collected (see Figure 3-7) onsite and immediately offsite.

A soil boring program is also recommended at the wooded depressions. Here, borings will be drilled at 20-foot centers along lines shown in Figure 3-8, to a depth of about 10 feet. These borings will be used to determine the depth of man-placed fill and to investigate the presence and location of buried capacitors. The exact number and location of borings should be determined after all information from the magnetometer survey has been analyzed. If no human transported fill is detected in several initial test borings, subsequent borings may not be necessary. Surface soil samples will



LEGEND

LINE OF SOIL BORINGS DRILLED AT 20 FT. CENTERS

SURFACE SOIL SAMPLE LOCATIONS

N

0 400

200

SCALE IN FEET

FIGURE 3-8
SOIL INVESTIGATIONS AT
THE WOODED DEPRESSIONS
LEMON LANE LANDFILL

also be collected at the wooded depressions (see Figure 3-8).

For each boring, samples will be composited for analysis at 6-inch intervals to the 1-foot depth and 1-foot intervals thereafter. The uppermost samples from each location will be analyzed for PCB's. Test results from analysis of the uppermost samples at each boring should be used to determine the need for further analysis. Should contamination be found in significant concentrations, the next interval should be analyzed. Analysis should continue with subsequent samples until no significant contamination is encountered. Levels of "significance" will be set by an appropriate regulatory agency. In borings with very high contamination, samples should be selected for analysis at greater intervals to reduce analytical costs.

Analysis for the full organic and inorganic data package from the EPA CLP will be performed on selected samples from the three deep borings and selected borings in the exposed capacitor areas. If EP toxicity constituents are found, EP toxicity tests will be run on selected samples to evaluate offsite disposal of contaminated soil at a landfill.

Surface soil samples will be analyzed for PCB's. Selected samples will be analyzed for the full organic and inorganic data package from the EPA CLP.

Selected native soil samples will also be index tested for physical characteristics. The results from index testing will be used to determine the site soil's ability to prevent offsite migration of contaminants.

A report describing the soil sampling program will be written to present the test results and to delineate the aerial extent and depth of soil contamination.

The cost estimate for soil sampling and analysis is based on:

- Three (3) deep borings for a total of 135 feet.
- Twenty (20) borings drilled at 80-foot centers for a total of 500 feet.
- Thirty (30) shallow borings drilled at the wooded depressions for a total of 300 feet.
- Thirty (30) selected samples will be tested for index properties.
- Two hundred fifteen (215) samples will require PCB analysis.
- Thirty (30) samples will be tested for the full organic and inorganic priority pollutant data package.
- Level D safety protection will be applicable to all sampling locations.
- A hydrogeologist will be present during all drilling activities to log soil samples.

Task 3-5 - Surface Water and Sediment Sampling and Analysis. The objective of this task is to determine the extent of contamination in the surrounding springs and creeks. Previous sampling efforts have reported contamination of the water and sediments offsite. Data obtained in this task will be used in determining if offsite remedial measures are required.

Eight sampling locations are indicated in Figure 3-9. At each location, surface water and sediments will be sampled. Surface water samples will be grab samples. Sediment samples will be taken with a hand coring device. Each core will be composted in 6-inch intervals. Test results from the uppermost samples at each location should be used to determine the need for further analysis. EP toxicity tests will be

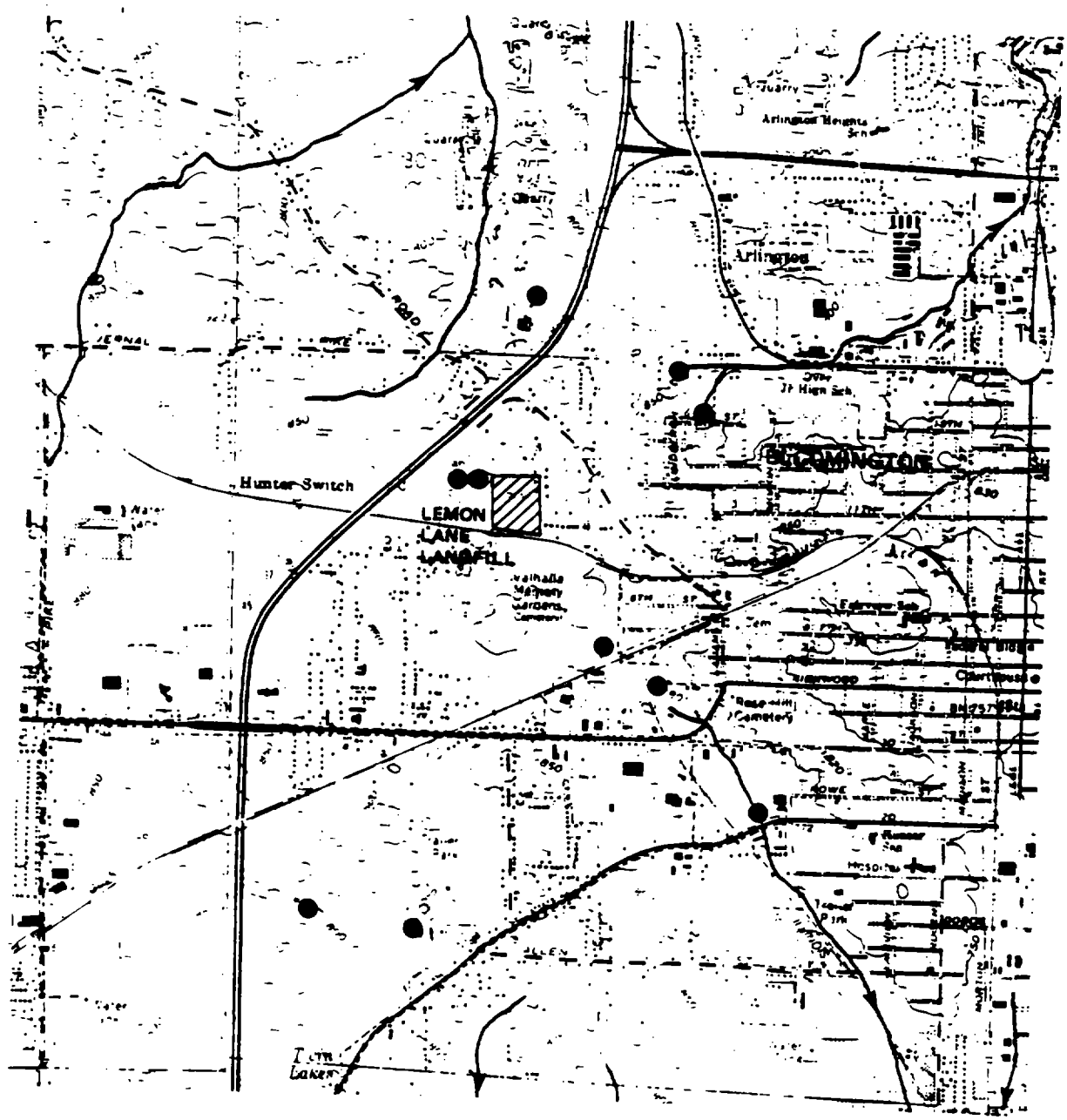


FIGURE 3-9
SURFACE WATER AND
SEDIMENT SAMPLING LOCATIONS
LEMON LANE LANDFILL

run on selected samples if the EP toxicity constituents are found in the organic and inorganic analysis.

The number of samples and the sample locations will be re-evaluated as part of Task 2-5, Work Plan Update and Report. Data generated as part of the court case and any additional sampling results from the FIT investigations will be considered.

All samples will be analyzed for the organic and inorganic analysis data package from the EPA CLP.

If significant contamination exists, additional sampling may be necessary. Cost estimates do not include any additional sampling.

A report discussing surface water contamination will be prepared that includes an evaluation of the extent and possible impact of surface water contamination.

The Order-of-Magnitude cost estimate assumes one surface water sample and one sediment sample per location will be analyzed. A total of 20 samples, including two blank and two duplicates, will be analyzed. Travel expenses to and from the site are not included in the cost estimates since this task can be undertaken during a site visit for other tasks.

Task 3-6 - PCB Bioaccumulation Study

The objective of this task is to determine if livestock or wildlife that may be hunted for consumption in the area surrounding the site or the wooded depressions are accumulating PCB's at levels that may be hazardous to consumers.

Interviews with local residents should be conducted to determine the wild game that are hunted in the area. Reports have indicated rabbits are hunted onsite. It is possible other game such as pheasant or quail are also hunted.

Once the appropriate species are identified, the animals should be trapped and tissue samples obtained. Tissues samples from representative livestock grazing in the pastures west of the site and those grazing near the wooded depressions southeast of the site should also be taken.

A report will be written describing the results of the PCB bioaccumulation study. The cost estimate assumes 16 tissue samples, including 3 duplicate samples and 1 blank, are analyzed for PCB's.

Activity 4 - Remedial Investigation Report

Task 4-1 - Assess Site Hazards. Data collected during the remedial investigation phase will be evaluated to determine the materials at the site which present a hazard to human health or welfare, or to the environment.

Existing standards will be reviewed to formulate conclusions and recommendations regarding the hazard potential at the site.

A report will be prepared summarizing the hazard evaluation process and presenting the results of the hazard assessment. A copy will be provided to appropriate EPA and State project personnel.

Task 4-2 - Conduct Review Meeting. Following a review of the report, a review meeting will be held with EPA and other appropriate agency personnel to determine remedial action

objectives, identify alternative level operable units and associated remedial actions to be addressed in the feasibility study and to discuss the contents of the remedial investigation report. A list of potential operable units and remedial actions will be prepared by the project team before the meeting to provide a basis for the discussion. A list of current potential operable units for the Lemon Lane Landfill site follows:

Remedial Action Category	Operable Unit Category
Initial Remedial Measures	Contaminated soil
Source Control Remedial Actions	Contaminated soil Contaminated surface runoff Contaminated groundwater
Offsite Remedial Actions	Contaminated groundwater Contaminated surface water Contaminated soil/sediment Domestic water supplies

To determine the viability of the various alternatives, the following factors will be qualitatively evaluated as they relate to the project objectives:

- The ability to control onsite release or to mitigate offsite impacts (high, medium, low).
- The adverse environmental impacts of each alternative (high, medium, low).
- The feasibility, applicability, and reliability of remedial action methods for location and conditions of release (yes, no, potential).
- A preliminary cost estimate indicator (high, low, medium) for both capital and operation and maintenance costs.

On the basis of the review meeting, an agreement will be reached on the remedial action alternatives to be used in the feasibility study.

Task 4-3 - Prepare Remedial Investigation Report. A draft remedial investigation report will be prepared to consolidate and summarize the data collected during the remedial investigation. The report will include a discussion of the operable units and remedial actions considered, recommendations regarding whether or not to proceed with the feasibility study, and the recommended remedial action alternatives that should be included in the feasibility study. The draft report will be submitted to EPA for review.

EPA's written review comments will be incorporated into the final report, which will be submitted to EPA for approval.

3.3.2 Remedial Investigation/Feasibility Study Estimated Costs/Schedule/Deliverables

Table 3-1 shows the estimated costs for the Lemon Lane Landfill RI/FS activities. A preliminary time schedule is shown in Figure 3-10. The following deliverables will be provided for the activities outlined in the RI/FS scope of work.

ACTIVITIES	DELIVERABLES
Activity 1	1. Quality assurance project plan 2. Preliminary goals and objectives* 3. Draft work plan* 4. Final work plan
Activity 2	1. Site health and safety assessment

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Table 3-1 (Page 1 of 2)
ESTIMATED COSTS FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEMON LANE LANDFILL
W65129.00

Activity	Minimum Cost $ Engineering	Minimum Cost $ Expense	Minimum Cost $ Subcontract	Minimum Cost $ Lab Analysis	Maximum Cost $ Engineering	Maximum Cost $ Expense	Maximum Cost $ Subcontract	Maximum Cost $ Lab Analysis	Estimated Cost Range $ Minimum	Estimated Cost Range $ Maximum
1.0 WORK PLAN PREPARATION										
1-1 Assemble Project Team	900	100	0	0	1,300	200	0	0	1,000	1,500
1-2 Gather & Review Background Data	3,300	900	0	0	5,000	1,300	0	0	4,200	6,300
1-3 Prepare Quality Assurance Plan	2,300	100	0	0	3,500	200	0	0	2,400	3,700
1-4 Identify Preliminary Goals & Objectives	1,200	0	0	0	1,800	0	0	0	1,200	1,800
1-5 Prepare Work Plan	2,500	200	0	0	3,700	300	0	0	2,700	4,000
Subtotal	10,200	1,300	0	0	15,300	2,000	0	0	11,500	17,300
2.0 SITE DEFINITION										
2-1 Prepare Site Health & Safety Assessment	0	0	1,400	0	0	0	2,100	0	1,400	2,100
2-2 Site Safety Facilities	1,600	4,900	0	0	2,400	7,400	0	0	6,500	9,800
2-3 Site Mapping	2,300	100	14,000	0	3,400	200	21,000	0	16,400	24,600
2-4 Survey for Buried Capacitors	6,700	1,800	0	0	10,000	2,700	0	0	8,500	12,700
2-5 Work Plan Update & Report	2,400	100	0	0	3,600	200	0	0	2,400	3,800
Subtotal	13,000	6,900	15,400	0	19,400	10,500	23,100	0	35,200	53,000

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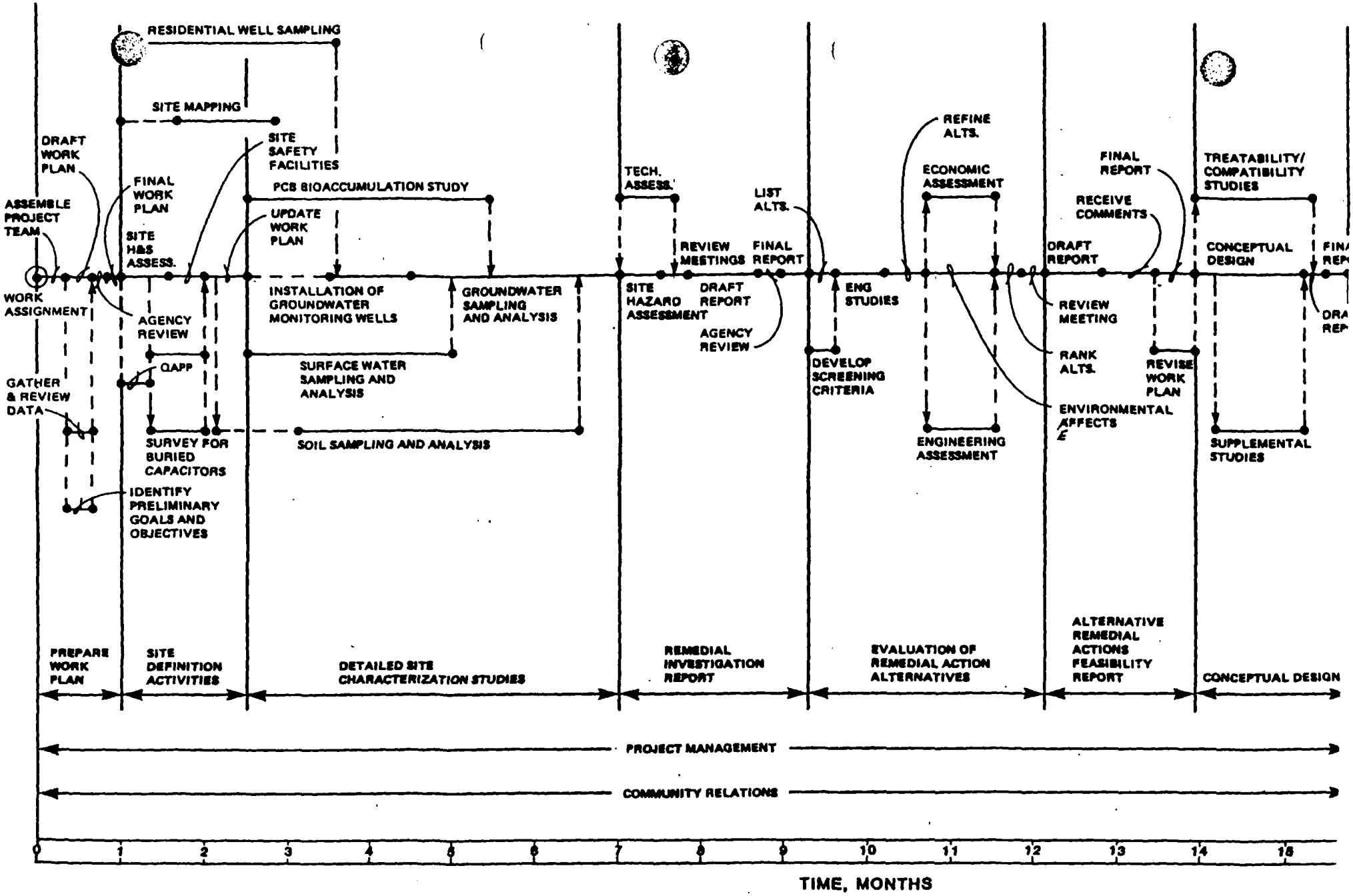
Table 3-1 (Page 2 of 2)
ESTIMATED COSTS FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
LEMON LAKE LANDFILL
W65129.00

Activity	Minimum Cost				Maximum Cost				Estimated Cost Range	
	$ Engineering	$ Expense	$ Subcontract	$ Lab Analysis	$ Engineering	$ Expense	$ Subcontract	$ Lab Analysis	$ Minimum	$ Maximum
3.0 DETAILED SITE CHARACTERIZATION										
3-1 Residential Well Sampling	4,200	2,700	0	18,100	6,300	4,000	0	27,200	25,000	37,500
3-2 Installation of Additional Monitoring Wells	4,300	800	11,500	1,300	6,500	1,200	17,200	2,000	17,900	26,900
3-3 Groundwater Sampling & Analysis	5,800	2,700	0	9,800	8,700	4,000	0	14,700	18,300	27,400
3-4 Soil Sampling & Analysis	9,400	7,500	26,400	40,000	14,100	11,200	39,600	60,000	83,300	124,900
3-5 Surface Water and Sediment Sampling & Analysis	1,500	1,200	0	13,700	2,200	1,800	0	20,600	16,400	24,600
3-6 PCB Bioaccumulation Study	3,600	1,600	500	1,600	5,400	2,400	700	2,400	7,300	10,900
Subtotal	28,800	16,500	38,400	84,500	43,200	24,600	57,500	126,900	168,200	252,200
4.0 REMEDIAL INVESTIGATION REPORT	11,100	1,300	0	0	16,600	1,900	0	0	12,400	18,500
5.0 EVALUATION OF REMEDIAL ACTIONS ALTERNATIVES	26,200	800	0	0	39,300	1,200	0	0	27,000	40,500
6.0 ALTERNATIVE REMEDIAL ACTIVE FEASIBILITY REPORT	8,500	800	0	0	12,700	1,200	0	0	9,300	13,900
7.0 CONCEPTUAL DESIGN	27,500	1,200	0	0	43,200	1,800	0	0	28,700	43,000
8.0 PROJECT MANAGEMENT	23,200	800	0	0	34,800	1,200	0	0	24,000	36,000
TOTAL	148,500	29,600	53,800	84,500	222,500	44,400	80,600	126,900	316,300	474,400


RESIDENTIAL WELL SAMPLING
SITE MAPPING
DRAFT WORK PLAN
SITE SAFETY FACILITIES
FINAL WORK PLAN
PCB BIOACCUMULATION STUDY
ASSEMBLE PROJECT TEAM
UPDATE WORK PLAN
SITE H&S ASSESS.
TECH. ASSESS.
LIST ALTS.
REFINE ALTS.
ECONOMIC ASSESSMENT
FINAL REPORT
RECEIVE COMMENTS
TREATABILITY/ COMPATIBILITY STUDIES
REVIEW MEETINGS
FINAL REPORT
DRAFT REPORT
CONCEPTUAL DESIGN
WORK ASSIGNMENT
INSTALLATION OF GROUNDWATER MONITORING WELLS
GROUNDWATER SAMPLING AND ANALYSIS
SITE HAZARD ASSESSMENT
DRAFT REPORT
ENG STUDIES
AGENCY REVIEW
AGENCY REVIEW
REVIEW MEETING
QAPP
SURFACE WATER SAMPLING AND ANALYSIS
RANK ALTS.
REVISE WORK PLAN
GATHER & REVIEW DATA
DEVELOP SCREENING CRITERIA
ENVIRONMENTAL AFFECTS
SURVEY FOR BURIED CAPACITORS
SOIL SAMPLING AND ANALYSIS
ENGINEERING ASSESSMENT
SUPPLEMENTAL STUDIES
IDENTIFY PRELIMINARY GOALS AND OBJECTIVES
PREPARE WORK PLAN
SITE DEFINITION ACTIVITIES
DETAILED SITE CHARACTERIZATION STUDIES
REMEDIAL INVESTIGATION REPORT
EVALUATION OF REMEDIAL ACTION ALTERNATIVES
ALTERNATIVE REMEDIAL ACTIONS FEASIBILITY REPORT
CONCEPTUAL DESIGN
PROJECT MANAGEMENT
COMMUNITY RELATIONS
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
TIME, MONTHS
PREPARATION OF CONTRACT DOCUMENTS AND SUBCONTRACTOR SELECTION

2. Site safety plan
3. Topographic map
4. Magnetometer survey results
5. Updated work plan*

Activity 3

1. Residential well sampling report
2. Installation of additional groundwater monitoring wells report
3. Groundwater sampling and analysis report
4. Soil sampling and analysis report
5. Surface water and sediment sampling and analysis report
6. PCB bioaccumulation study

Activity 4

1. Site hazard assessment report
2. List of potential operable units and remedial actions
3. Draft remedial investigation report for EPA review and comment*
4. Final remedial investigation report

Activity 5

1. Listing of potential alternatives
2. Screening process report
3. Technology assessment report
4. Report on refining alternatives
5. Report on economic assessment
6. Environmental assessment report
7. Engineering assessment report
8. Report on comparative ranking of

	alternatives 9. Report on comparative ranking review process
Activity 6	1. Draft feasibility report for EPA review and comment* 2. Final feasibility report
Activity 7	1. Draft conceptual design report for EPA review and comment* 2. Final conceptual design report

* Requires EPA review or input.

3.4 SOURCE CONTROL REMEDIAL ACTIONS

3.4.1 Objective

Source control remedial actions include measures to prevent, reduce, or eliminate contamination by either containing the hazardous wastes in place or removing them from the site.

Potential hazards anticipated to be addressed in the source control remedial actions, will include:

- o Capacitors and capacitor parts
- o Contaminated soil
- o Contaminated groundwater
- o Contaminated surface waters

3.4.2 Remedial Action Alternatives

Alternative source control remedial actions that may be appropriate for the Lemon Lane Landfill site or the wooded depressions include:

- No action (may apply to all or part of the actions).
- Extensive monitoring of the site with no further removal or containment activities.
- Excavation and removal of capacitors and capacitor parts offsite or containment onsite.
- Excavation and removal of contaminated soil offsite or containment onsite.
- Containing contaminated subsurface areas and groundwater using a cutoff wall, cap and bottom sealing, or a well field with pumping, treatment, and reinjection.
- Collecting contaminated groundwater with onsite treatment and disposal or offsite disposal.
- Treatment of contaminated groundwater in permeable treatment beds.
- Surface water drainage control measures to prevent run-on or runoff. Collection for treatment or offsite disposal.
- Diversion of spring waters at the wooded depressions by construction of culverts.

3.5 OFFSITE REMEDIAL ACTIONS

3.5.1 Objective

Offsite remedial actions include measures to mitigate the effects of hazardous waste contamination that may have migrated beyond the site.

3.5.2 Remedial Action Alternatives

Alternative offsite remedial measures that may be appropriate for the Lemon Lane Landfill or the wooded depressions site include:

- No action (may apply to all or part of the actions).
- Offsite monitoring with no other mitigative measures.
- Limited access to contaminated offsite areas (with or without monitoring).
- Containment onsite or removal of capacitors and capacitor parts to an approved disposal area.
- Containment onsite or removal of contaminated soil or sediment to an approved disposal area.
- Abandonment and plugging of downgradient, residential wells and providing an alternative water supply.
- Containing contaminated groundwater by using a cutoff wall, cap and bottom sealing, or a well field with treatment and reinjection.
- Collecting contaminated groundwater for treatment or offsite disposal.

- Treatment of contaminated groundwater in permeable treatment beds.

GLT418/17

4.0 COMMUNITY RELATIONS

The purpose of this assessment is to describe the past and current community and agency activities associated with the Lemon Lane site. It will provide U.S. EPA with an understanding of the existing and potential interest in the site by the general public and the local and State agencies. The major actors and issues to consider in developing a Community Relations Plan are identified in the following discussion. U.S. EPA, Region V, will be responsible for developing and implementing the final Community Relations Plan.

This assessment is based on: 1) a review of U.S. EPA, ISBH and Monroe County Health Department files on the Lemon Lane site, including newspaper articles, and 2) personal interviews with the following individuals:

- o U.S. EPA, Region V: Jack Braun, RSPO, for the Lemon Lane Site.
- o Indiana State Board of Health: Jackie Strecker, Division of Land Pollution Control.
- o Monroe County Health Department: Steve Creech, Deputy Health Officer and Dennis Williamson, Public Health Sanitarian.
- o City of Bloomington, Scott Fore, Attorney.

4.1 COMMUNITY RELATIONS BACKGROUND

4.1.1. History of Community Relations Activities

The first occurrence or notification of a health threat posed by PCB's in the Bloomington area occurred in 1976. Since

that time, local citizens have become very knowledgeable about PCB's and have expressed concern over several dumps where capacitors containing PCB's have been discarded. The Lemon Lane Landfill, as well as others in the County, are being addressed by the local health department, the City of Bloomington, the Environmental Quality Conservation Commission (EQCC) and the League of Women Voters.

The current city administration was informed by Mr. Mullis and Mr. Hendrickson on June 22, 1981, that capacitors and other related material containing PCB's were contained in the Lemon Lane Landfill. Subsequent investigations reported PCB contaminated soil onsite. In September 1981, a letter was sent to Mr. Dexter Sargent whose cattle graze in a pasture adjacent to the Lemon Lane Landfill. He was warned about the danger of bioaccumulation of PCB's and the potential health risks involved with the use of his cattle for human consumption.

In October 1981, the City of Bloomington amended a suit against Westinghouse Corporation to include the Lemon Lane Landfill. The original suit was filed in April 1981 for polluting the publicly owned Winston-Thomas Treatment Works (WTTW) and 8 miles of interceptor. Also in October 1981, the City offered to provide free water testing for area residents using well water. Those tests indicated that no contamination was present.

An article which appeared in the Bloomington Harold Telegraph in June 1981, quoted James Carmichael, former operator of the Lemon Lane Landfill, stating that he routinely set fire to many capacitors brought to the dump by the Westinghouse Corporation in the 1960's. Area residents were quoted in the article as not being surprised at the discovery of capacitors at the dump.

In June 1982, the Illinois Central Gulf Railroad was warned by the Monroe County Health Department that a potentially hazardous situation was present on their property 1/2-mile southeast of the landfill. PCB levels in two of five soil samples exceeded 50 ppm. They were requested to restrict those areas. On June 10,1982, the railroad wrote to the Board of Health indicating that they had constructed a fence, and erected warning signs around the suspect area.

In July 1982, the Indiana Star reported that the Westinghouse Corporation wanted to talk out of court with city officials about the city's PCB suit.

In December 1982, U.S. EPA filed a lawsuit in Federal Court in Indianapolis against Westinghouse seeking a preliminary injunction requiring the company to begin cleaning up hazardous PCB's at Lemon Lane Landfill.

In May 1983, Wendell K. Hendrickson of Bloomington filed suit against Westinghouse seeking compensatory damages for PCB related health problems. He claims as a young boy and with Westinghouse's knowledge, he salvaged copper from capacitors dumped by Westinghouse at Lemon Lane. Mr Hendrickson claims he opened approximately 500 capacitors, drained the PCB's, and sold the copper for money.

Media coverage has been provided by the Bloomington Harold Telegraph, the Indianapolis Indiana Star, and the Louisville Carrier Journal which has a southern Indiana edition. Radio stations, WTTS and WGTC, have also covered the site. Local television station 4 has provided coverage of the site.

4.1.2 Community Relations Issues

Based on a review of agency files and interviews with local officials, the following concerns and issues were identified:

Children Playing on the Site

The Monroe County Health Department received the greatest number of complaints relating to the site regarding children playing with the capacitors and refuse at the site. At the present time, there is no fence or other means of controlling access to the site. Signs have been posted informing people that PCB's have been found on the site. In addition, the cattle that graze in a pasture adjacent to the site are of concern to citizens who fear that PCB's may be entering the food chain.

Site Visibility

Areas along the south and west site boundaries contain capacitors and interior capacitor parts are scattered on the surface. It has been reported that little vegetation grows in these areas and occasional standing water in these areas is very black.

Lack of Knowledge

Local officials and citizens have expressed concern that they do not know what exactly is contained on the site. They are aware that capacitors have been found but there is no information on how many, or what else is buried in the dump. The extent of the contamination is also unknown.

Duplication of Effort

The City of Bloomington and its lawyers have entered into negotiations with the Westinghouse Corporation regarding the

collection of information on the site, development of alternatives and selection of a recommended course of action to clean up the site. The City and Westinghouse have hired separate engineering firms to work together to provide this information. A stipulation has been signed by both parties to the lawsuit, placing the lawsuit on hold, while these negotiations and data gathering occur. Extensive work has been done at the site and the attorney for the City believes they are making progress toward a resolution. The concern is that much of the information that they developed can be utilized by EPA, and, therefore, EPA should not duplicate these efforts. Both the City and Westinghouse recognize that their recommended plan for site reclamation will need the approval of the U.S. EPA and the Indiana State Board of Health.

Availability of Information

Local officials are concerned with receiving timely information from a single source. They should be informed prior to activities at the site taking place. This will allow the local health department and the City of Bloomington to respond to citizen inquiries with informed answers. Secondly, activities should be coordinated among the Indiana State Board of Health, U.S. EPA and the subcontractor so that a single viewpoint and source of information is presented to the local community.

Because the community has been involved with the PCB issues for seven years, and in consideration of the ongoing lawsuit, detailed technical information should be provided to the community in a timely matter. In addition, this information should be located at a central location, which is easily accessible by Monroe County citizens.

4.1.3 Community Relations Participants

Major participants at the Lemon Lane Landfill site have been the City of Bloomington, Monroe County Health Department, Westinghouse Corporation, the Environmental Quality Conservation Commission and the League of Women Voters. The citizens who live near the landfill site have expressed their concerns to the city government and County Health Department but have not formed an advisory group to push for site cleanup. This is probably due to the fact that a lawsuit has been underway since 1981 and negotiations are proceeding to resolve the problem.

The City of Bloomington has been involved since 1981 when it was informed of the existence of capacitors containing PCB's at the Lemon Lane Landfill site. They amended their lawsuit on the WTTW to include cleanup at the Lemon Lane Landfill. Currently, negotiations are underway between Westinghouse and the City of Bloomington regarding how to cleanup the site, and the lawsuit is on hold while these discussions continue.

Complaints regarding the landfill operations are received on a regular basis by the Monroe County Health Department. They average approximately two complaints each week regarding the site. Primarily these complaints concern the uncontrolled access to the site which permits children to play with the exposed capacitors.

The EQCC is an organization of citizens appointed by the mayor of Bloomington. They have monitored the PCB issue in Monroe County and are currently pursuing posting signs on streams and rivers which were effected by the effluent from the local treatment plant when the plant was processing wastewater containing PCB's.

The League of Women Voters has been involved in the Lemon Lane Landfill due to their concern about PCB's in the Monroe County area. They held an informational meeting in fall 1982, to discuss PCB contamination in Monroe County. Members of EPA and the ISBH were in attendance at the meeting.

4.2 COMMUNITY RELATIONS OBJECTIVES AND TECHNIQUES

4.2.1 Community Relations Objectives

- Maintain contact with the City of Bloomington, Monroe County Health Department, EQCC and League of Women Voters and provide continual updating throughout the site work and the remedial action period.

- Inform the general public, elected officials and media of the dates, activities, and purpose of any major field work and particularly any work that will directly affect individuals or their property.

- Identify a central contact who is available to provide a quick, reliable response to any questions or concerns by individuals or groups about the Lemon Lane site and developments.

- Handle all media and public inquires through a single central contact. The U.S. EPA, Region V, should supervise the release of all information to the media.

- Provide all information, especially technical aspects, in a manner understandable to all interested parties. In addition, because of the ongoing

lawsuit and high visibility of the PCB issue, detailed information should be provided to the City of Bloomington lawyers, Monroe County Health Department, EQCC, and the League of Women Voters.

6. Provide the public and agencies an opportunity to comment on the alternatives identified by the feasibility study before selection of the final corrective actions.

7. Remain sensitive to changes in community or public concerns throughout the site work.

4.2.2 Community Relations Techniques

At this time, EPA is expected to be the lead agency for the Lemon Lane Landfill site. Thus, the Community Relations Plan will be implemented by the EPA, Region V, office in Chicago. Specific staff responsibilities will be identified in the Community Relations Plan. The techniques listed below are suggested methods to meet the community relations objectives outlined in the previous section. Project staff must remain sensitive to community attitudes and must revise the plan as conditions require.

1. Initial Briefing of Local Officials

   An initial briefing of the Monroe County Health Department, City of Bloomington, EQCC, and League of Women Voters should occur before any action is taken on the site work. This briefing may take place in person or over the telephone. The briefing should describe the steps and purposes of the planned site investigation and activities.

2. City of Bloomington Consultation

The City of Bloomington should be consulted continually throughout the site work due to the ongoing lawsuit. They should be given the opportunity to provide input during the planning, analysis, and decisionmaking activities since the City and Westinghouse both have employed engineering consultants to analyze the site and recommend cleanup procedures. They should also review all findings and information to be made available to the public.

3. Property Owner Notification

All individuals owning property near the site boundaries should be formally notified by letter of any onsite work before it is started. Also, all property owners should be formally notified of any information that is about to be issued in press releases. Thus, owners will be aware of findings or activities affecting their property before hearing about them through the news media.

4. Agency Contacts

Periodically throughout the site work, the local agencies and groups listed above under Item 1 should be contacted about ongoing activities. This contact can be an informal telephone call to keep local officials up to date and to determine if any public concerns or interests have emerged. Several other public officials may be added to this list as they indicate interest. In addition, these agencies should be notified of the planned community

relations activities and any information about to be made available to the public.

5. Press Releases

Press releases and media coverage are expected to be the major avenue for informing the general public. The releases should be issued at major progress points. At a minimum, press releases should be issued at the beginning of the onsite investigations; at the completion of the remedial investigation, draft feasibility study, and final feasibility study; and prior to any remedial measures being taken.

6. Agency Reviews

The Monroe County Health Department, City of Bloomington, EQCC, and League of Women Voters should be given preliminary drafts of the remedial investigation and feasibility study reports for their review and comments. The reports should then be revised as needed to reflect this local review before they are issued for general public review.

7. Public Review

Prior to selection of final remedial actions, the draft feasibility study should be made available for a 3-week public review period. This review will allow input from all interested parties, including public interest and environmental groups, public agencies and officials, and individuals. It does not appear that a public meeting is merited until the lawsuit regarding Lemon Lane is resolved. The

final remedial investigation and feasibility study reports should also be made available for public review at the local government offices or public libraries.

GLT418/28

Appendix A
SITE VISIT MEMORANDUM

MEMORANDUM

TO: File

FROM: Phil Smith
Project Manager

DATE: April 29, 1983

RE: Site Visit to Lemon Lane Landfill, Bloomington, Indiana

JOB NO: W65129.00

On April 25, 1983, Phil Smith (CH2M HILL) and the following persons participated in a site visit at the Lemon Lane Landfill site in Bloomington, Indiana.

- Jack Braun - U.S. EPA
- Jackie Stecker - Indiana State Board of Health
- Tom Gilgenbach - CH2M HILL

Two vehicles were driven to the site and parked outside the east entrance gate at approximately 10:00 a.m. Protective clothing and monitoring equipment were utilized as called for in the Site Safety Plan. In addition, an HNU organic vapor analyzer was utilized. The site was classified as a Level D site.

The following comments reflect the observations of the CH2M HILL members of the visitation team:

- The weather during the site visit was sunny, approximately 65°F with a light wind out of the west.
- An unlocked gate is located at the entrance to the site. The site is unfenced with the exception of the west boundary where a 4-foot barbed wire fence was erected to prevent cattle from wandering onsite.
- Exposed capacitors and interior capacitor parts were found along the south boundary and in the southwest corner of the site.
- Several footpaths were found immediately east of the exposed capacitors leading up a slope from the railroad tracks to the site. Footpaths were also found in the northern half of the landfill.

- Bicycle tire marks were found onsite approximately 50 feet north of the south boundary.

- Exposed refuse, mainly large metallic items, were found in the northern area of the site. No capacitors were seen in this area.

- HNU monitoring of organic vapors throughout the site did not show levels above background. "Sweet" odors were detected by Jack Braum and Jackie Strecker.

- Mr. Pelfree, a landowner adjacent to the site, inquired as to our purpose. Following explanation as to the team's identities and purpose, Mr. Pelfree offered information regarding the landfill from his experiences living next to the site for approximately 20 years. The following are some of his comments:

  - The area where most of the capacitors were dumped was in the large pit near the center of the site.

  - Local children routinely play in the landfill. Also, children used to scavenge copper from the capacitors. He also scavenged cooper from the capacitors.

  - Some residents in the area hunt and eat rabbits inhabiting the landfill.

GLT418/1

Appendix B
SITE CHRONOLOGY

CHRONOLOGICAL FILE

Date: 00/00/50
Document No.: 00001
Key Word: Site Data
Description: Lemon Lane Landfill was known to be operating in 1950. The landfill operation was deactivated in 1964, but some use for landscaping wastes continued until 1982.

Date: 06/22/81
Document No.: 00011
Key Word: Sampling/Testing
Description: ISBH received a report that the landfill contained capacitors. A site visit was performed by the Bloomington City Mayor, city attorney, city chemist, and a staff member of ISBH. ISHB collected two soil and debris samples in the vicinity of the capacitors onsite. The City also collected two soil samples. All samples were later reported to contain high levels of PCB's.

Date: 06/25/81
Document No.: 00067
Key Word: Sampling/Testing
Description: The City of Bloomington tested 16 residential wells, three offsite surface water samples, and one offsite soil sample for PCB contamination. All samples were reported free of PCB's.

Date: 06/30/81
Document No.: 00018
Key Word: Sampling
Description: U.S. EPA personnel conduted a site visit on June 30 and July 1, 1981. Four soil sampling locations (9 samples), three residential wells, and one pond water with sediment were sampled and analysed for priority pollutants. Results were made available on 9/9/81. PCB analysis of pond water showed 0.8 ppb PCB's. PCB levels in soil samples were reported from 0.1 to 57,000 ppm as Aroclor 1248.

Date: 07/16/81
Document No.: 00014
Key Word: Miscellaneous
Description: IDNR letter to U.S. EPA reports the possible seepage of drainage underground

through the sinkholes in the area. Underground drainage was reported to reappear at Twin Lakes, located a mile south and 50 feet lower than the site. The possibility that underground drainage migrated northwest to the headwaters of Stouts Creek was also presented.

Date: 07/23/81
Document No.: 00012
Key Word: Sampling/Testing
Description: The City of Bloomington's chief chemist collected two samples at the Leon Mullis residence. Collection points were a wooded junk disposal site and the yard north of the house. A blood sample from Leon Mullis also was taken. No PCB's were detected in the yard soil or blood sample. The junk disposal area sample contained 3500 mg/kg PCB.

Date: 07/27/81
Document No.: 00016
Key Word: FIT Activities
Description: A plan for cleanup of Lemon Lane Landfill is completed as part of Ecology and Environment's FIT activities. The plan included removal of soil and capacitors to the center of the landfill and placement on an impervious liner.

Date: 07/28/81
Document No.: 00017
Key Word: Miscellaneous
Description: The mayor of Bloomington is asked by the IDNR for cooperation regarding erection of a fence around the site, posting of warning signs, and capping of the area with clay to prevent infiltration of rainwater.

Date: 08/04/81
Document No.: 00021
Key Word: Miscellaneous
Description: Indiana Stream Pollution Control Board notifies the mayor of Bloomington of concern over unrestricted access to the site. It is suggested that Bloomington initiate measures including collection of PCB materials to the site center and isolation in impermeable sheeting, fencing of site, and regrading or lining

of certain areas of the site.

Date: 08/17/81
Document No.: 00022
Key Word: Sampling/Testing
Description: ISBH collects three offsite surface water samples and one sediment sample. One sample is reported to contain PCB's at 5.7 ppb.

Date: 08/24/81
Document No.: 00023
Key Word: TAT Activities
Description: TAT team conducts inspection of landfill and schedules meeting with city officials to discuss containment activities.

Date: 09/16/81
Document No.: 00027
Key Word: Miscellaneous
Description: A local resident is notified by DNR that his cattle may have grazed on the dumpsite and was informed of the possibility of bioaccumulation of PCB's in the animals. The Monroe County Health Department, State Board of Veterinary Health, ISBH Meat and Poultry Division and U.S. EPA were also notified.

Date: 09/18/81
Document No.: 00028
Key Word: FIT Activity
Description: The site is inspected for hazardous waste site ranking.

Date: 10/07/81
Document No.: 00034
Key Word: Sampling/Testing
Description: U.S. EPA, ISBH, and ISGS personnel collect environmental samples offsite. Four surface and spring samples with corresponding sediments and two residential well samples were taken. Chlordane (0.06 ppm) was found in springbed sediments 1/2 mile northeast of Upper Twin Lake. Bis (2-ethylhexl) pthalate (23 ppb) was found in a residential well water sample, PCB (6.8 ppb) was found in a spring water sample, and PCB (0.5 ppm) was found in the corresponding springbed sediment.

Date: 10/22/81
Document No.: 00029
Key Word: Legal Action
Description: EPA members of the Superfund site section, Region V, Enforcement Division, Central District office, headquarters enforcement staff and Department of Justice assemble to discuss the preparation of the case against Westinghouse, the PCB generator.

Date: 10/23/81
Document No.: 00030
Key Word: FIT Activities
Description: Technical Development Document regarding Mitre Model scoring is completed for Lemon Lane Landfill by Ecology and Environment.

Date: 10/29/81
Document No.: 00031
Key Word: Miscellaneous
Description: ISBH conducts site visit to acquaint EPA and FIT teams with the site.

Date: 02/19/82
Document No.: 00035
Key Word: Sampling/Testing
Description: The City of Bloomington collected environmental samples in the depressed wooded area approximately 1/2 mile southeast of the site between February 19 and 26, 1982. PCB analysis was run on eight soil and water samples. Soil contamination ranged from 0.2 ppm to 360 ppm of PCB. Water contamination ranged from 1 ppb to 18 ppb of PCB.

Date: 04/13/82
Document No.: 00038
Key Word: Miscellaneous
Description: The City of Bloomington requests fund matching by EPA for erection of a secure fence around the landfill. An official request is submitted to EPA on 7/19/82 for reimbursement of 50 percent of the cost.

Date: 05/00/82
Document No.: 00039
Key Word: Site Data
Description: The site was investigated for location

of sinkhole features and bedrock depth as part of FIT activities. Seismic refraction, radar and EM methods were utilized.

Date: 06/04/82
Document No.: 00040
Key Word: Miscellaneous
Description: The Monroe County Health Department recommends that Illinois Central Gulf Railroad Co. restrict access to their property located approximately 1/2 mile southeast of the site due to PCB contamination of soil and water in the area.

Date: 06/10/82
Document No.: 00044
Key Word:
Description: Illinois Central Gulf Railroad notifies EPA of completion of a fence around their contaminated right-of-way.

Date: 07/00/82
Document No.: 00068
Key Word: Miscellaneous
Description: The Bloomington City Council conducted appropriation procedures for fencing and warning signs.

Date: 07/16/82
Document No.: 00047
Key Word: Miscellaneous
Description: Indianapolis Star reports that Westinghouse requested an out-of-court discussion of the $329 million suit against it by the City of Bloomington for improper disposal of PCB's in several county dumps and the city sewers.

Date: 07/28/82
Document No.: 00054
Key Word: Sampling/Testing
Description: Nine springs are sampled by EPA and analyzed for organics and inorganics on July 28 and 29, 1982. No PCB's are reported found in any sample.

Date: 10/19/82
Document No.: 00054
Key Word: Sampling/Testing
Description: Four monitoring wells and Sargent's pond

are sampled by EPA and tested for organics and inorganics. No PCB's are reported found in any sample.

Date: 11/00/82
Document No.: 00057
Key Word: FIT Activity
Description: Ecology & Environment submitted an interim report on field investigations. Four monitoring wells were installed on 7/16/82 and nine springs were sampled on 7/28 and 29, 1982. Spring water analysis revealed some organic compounds, but no PCB's.

Date: 11/22/82
Document No.: 00070
Key Word: Miscellaneous
Description: A local physician reports a recurrent bony growth on the hand of a resident who had scavenged copper from capacitors in his youth.

Date: 12/08/82
Document No.: 00059
Key Word: Site Data
Description: Dr. Powell of Geosciences Research Associates, Inc. completes draft of geology and hydrology of Lemon Lane Landfill, Monroe County, Indiana.

Date: 12/09/82
Document No.: 00054
Key Word: Sampling/Testing
Description: Eleven springs are sampled by EPA on December 9 and 15, 1982, and tested for organic contents. PCB's (Aroclor 1248) are reported found in three springs as follows: Stoney Spring East, 1.85 ppb; Quarry Spring, 2.7 ppb; and Illinois Central Spring, 12.2 ppb.

Date: 03/30/83
Document No.: 00064
Key Word: Legal Action
Description: Local newspapers report two independent suits filed by residents against Westinghouse Corp. and Monsanto Corp. for negligence in proper disposal and adequate warning regarding PCB's.

Date: 04/25/83
Document No.: 00000

Key Word: Site Visit
Description: RAMP site visit conducted by personnel from CH2M HILL, ISHB, and EPA.

Appendix C
FEASIBILITY STUDY
ACTIVITIES 5-8

Activity 5 - Evaluation of Remedial Action Alternatives

Task 5-1 - Development of Potential Remedial Alternatives. Based on the work completed in the remedial investigations, a list of potential remedial actions will be developed. The no action alternative will be included in the evaluation as a baseline alternative. It may be a viable alternative if potential remedial actions present a greater danger than the identified hazard itself, if an appropriate engineering solution is not available, or if cost-effectiveness dictates.

Task 5-2 - Develop Screening Criteria. Screening criteria will be prepared to assess the remedial action alternatives. The factors addressed in developing the screening criteria include:

- Economic. The capital and long-term operational and maintenance (O&M) costs are estimated and a present worth value determined for cost comparison of alternatives.

- Environmental Effects. The adverse impacts of the alternatives, the adequacy of source control, and the acceptable mitigation of danger to public health and welfare and the environment will be identified. Included in the criteria will be permit requirements, institutional issues (e.g., implementability).

- Engineering. The alternative must be technically feasible regarding site location and conditions. It must be applicable to the project needs, and must be a reliable method of solving the problem.

The identified remedial action alternatives will be screened according to these criteria, and a report will be prepared summarizing the screening process.

Task 5-3 - Additional Engineering Studies. After screening the remedial action alternatives for further evaluation, the project team will evaluate the field investigation studies completed during the remedial investigation. They will identify any additional engineering studies that are required to fully evaluate the cost, the constructibility, applicability, or reliability of any alternative. It has been assumed no additional engineering studies will be required.

Task 5-4 - Technology Assessment. Since treatment or disposal of soils, sediments, groundwater, or surface water is a potential remedial action alternative at the site, a technical assessment of treatment options will be conducted.

A report will be prepared documenting the results of a literature search and technology assessment, and present the conclusions regarding the applicability of various technologies. One or more technologies may be identified for further evaluation.

Task 5-5 - Refine Alternatives. Based on all the available data, the remaining alternative remedial actions will be refined and more fully developed. A detailed written description of each alternative, basic component diagrams for each alternative to be considered, major equipment needs and utility requirements, conceptual site layout drawings, and preliminary implementation schedule will be made. A report will be prepared presenting this information.

Task 5-6 - Economic Assessment. Construction and O&M costs will be estimated for each remedial action alternative. The

comparative cost impacts of health and safety requirements on construction and continuing O&M will be included in the cost estimates. The cost estimates prepared for this task will be Order-of-Magnitude.

After completion of the cost estimate, a present worth analysis will be conducted. A report will then be prepared summarizing the findings and presenting the results of the cost estimates.

Task 5-7 - Environmental Effects. The alternatives will be evaluated based on the environmental screening criteria developed. The comparative assessment will determine:

- o The adverse environmental impacts of the alternatives.
- o The effectiveness of adverse impact mitigation measures.
- o The adequacy of source control measures.
- o The effectiveness of offsite control measures.
- o The institutional and legal (environmental permits) constraints.

A report will be prepared summarizing the findings and presenting the results of this assessment.

Task 5-8 - Engineering Assessment. The engineering aspects of the alternatives will be assessed on the basis of acceptable engineering practices. The specific factors to be evaluated include:

- o Reliability
- o Established technology
- o Suitability to control the problem

- o Risks to construction and operational personnel health and safety
- o Constructibility and operability regarding site conditions
- o Maintainability and sensitivity to offsite upset
- o Offsite transportation and disposal capacity requirements

A report will be prepared summarizing the results.

Task 5-9 - Comparative Ranking of Alternatives. During this task, the assessments will be compiled, the alternatives ranked within each assessment category, and overall rankings prepared. This ranking will be based on professional judgment and will reflect EPA, State, local and public input. A report will be prepared summarizing the comparative rankings.

Task 5-10 - Comparative Ranking Review Meetings. Review meetings will be held to solicit input into the comparative ranking of the remedial action alternatives. The review meetings should include both U.S. EPA and State personnel.

A report will be prepared summarizing the review process and the comments received.

Activity 6 - Alternative Remedial Actions Feasibility Report.

A draft report will be prepared summarizing data developed during the evaluation of alternatives and documenting the alternative remedial actions assessment process. On the basis of the entire evaluation process, one alternative or a combination of alternatives may be recommended for

consideration in the conceptual design. This draft report will be submitted for agency review.

Following receipt of review comments and approval of the recommended remedial actions, the Alternative Remedial Actions Feasibility Study Final Report will be submitted. The final report incorporates the review comments and documents the State and EPA decision process.

Activity 7 - Conceptual Design

The conceptual design activity will be the mechanism by which the selected remedial alternative(s) are defined. The following scope of work addresses the conceptual design requirements, and provides additional data that will be needed to prepare a design consistent with the objectives of the proposed remedial actions. It is intended to be sufficient to allow preparation of an Order-of-Magnitude level cost estimate. It is recommended that the appropriate lead agency be included in the review of work plans and work products during conceptual design activities.

Task 7-1 - Preparation of Conceptual Design Elements. The following conceptual design elements will be developed as required for the remedial actions selected.

- o A conceptual plan view drawing of the overall site, showing general locations for project actions and facilities.

- o Conceptual layouts (plan and cross sectional views where required) for the individual facilities, other items to be installed, or actions to be implemented.

- Conceptual design criteria and rationale.
- A description of types of equipment required, including approximate capacity, size and materials of construction.
- Process flow sheets and a description of the process.
- A description of structural concepts for facilities.
- Utility requirements and rationale.
- An evaluation of potential construction problems, associated risks, and the proposed solutions.
- Right-of-way requirements.
- A description of technical requirements for environmental mitigation measures.
- Additional engineering data required to proceed with design.
- Construction permit requirements.
- Closure and long-term monitoring requirements and rationale.
- Performance standards to define the levels of clean-up required to complete the remedial action.
- Order-of-Magnitude implementation cost estimate
- Order-of-Magnitude annual O&M cost estimates and duration of operating expenses

- o Preliminary project schedule

Task 7-2 - Supplementary Activities. To supplement the conceptual design and to assist in the design and implementation of the recommended remedial action, additional work may be required. Examples of some additional activities are:

- o Review the community relations and environmental impacts of the remedial actions.
- o Prepare a project schedule.
- o Refine environmental permit and institutional requirements.

Task 7-3 - Preparation of Draft Report. A draft report summarizing conceptual design data and information will be prepared and submitted for agency review.

Task 7-4 - Draft Report Review. A draft report review meeting will be scheduled and review comments will be discussed.

Task 7-5 - Preparation of Final Conceptual Design Report. After receipt of written review comments, the draft report will be finalized and submitted.

Activity 8 - Project Management

This activity occurs throughout the remedial investigation/feasibility study. General tasks of this activity include establishment of project records; review meetings with U.S. EPA and State Agency; preparation of monthly reports; ongoing monitoring of staffing, budgets, contractor performance, and maintaining quality assurance programs.

GLT418/15

E P A PROJECT

ECOLOGY AND ENVIRONMENT, INC

MEMORANDUM: REGION V

COST CENTER EP 151-15

TO: Gregory Vanderlaan

FROM: Region V TAT

VIA: Scott McCone

SUBJECT: Lemon Lane Landfill Inspection on August 25, 1981

DATE: August 26, 1981

COMMENTS:

TAT members were requested by Gregory Vanderlaan to meet Pete Razer, Indiana Board of Health, and inspect the Lemon Lane Landfill in Bloomington, Indiana. TAT members observed damaged and leaking capacitors along the south and west property line at the landfill. Pete Razor indicated that soil in this area contained 300,000ppm or 30% PCB. The TAT made inspections of several sink holes in the immediate area. No capacitors were observed.

Tuesday August 25, 1981

At 0830am TAT members Tom DeFouw and Scott McCone met with Pete Razor, Indiana Board of Health to discuss PCB capacitor problem at the Lemon Lane Landfill in Bloomington, Indiana. Mr Razor indicated that the landfill was owned by the City of Bloomington and operated during the fifties and early sixties. Mr Razor also stated that residents in the area have been stealing capacitors, opening them, salvaging the copper wire then dumping the remains on the ground. Mr Razor indicated that capacitors may have been removed from the landfill area and felt that the capacitors may be located in several sink holes surrounding the site.

At 0900, we arrived at Lemon Lane Landfill. The site is composed of approximately seven acres , covered with dense vegetation. Mr Razor indicated that the west and south property lines had exposed capacitors. Soil samples in this area had PCB concentrations in excess of 330,000ppm or 30%.

Ay 0915, we entered the site in Level C protection and proceeded to the south property line. The south property line is located along a railroad rite of way. The fill edge forms a sharp dropoff of approximately 15 feet and has exposed capacitors and insulation along the bank. It is difficult to estimate the amount of capacitors in this area. Many capacitors protrude from the bank and fill material.

The west property line has exposed capacitors protruding from a more gradual slope. We found broken glass throughout the site. There was evidence of cows grazing and children playing in the landfill.

At 1000am, we departed the site.

At 1005am, we proceed to survey the surrounding area for sink holes.

At 1010am, we examined a sink hole east of the site at W 17th St. and Monroe. No capacitors were found. A small unnamed creek was identified leaving the sink hole. The water appeared clear with some algae growth.

At 1100am, we met with John Freeman and John Fanyo, engineers from the City of Bloomington, to discuss the PCB problem at the Lemon Lane Landfill and the immediate area. The following recommendations were made at this meeting.

1) All streams in the immediate area of Lemon Lane Landfill should be sampled and analyzed for PCB's. Both water and sediment samples should be obtained.

2) A groundwater survey should be made of the area. The survey should be conducted by the Indiana Geological survey located in Bloomington.

3) A fence should be erected around the entire site to prevent access by livestock and public. Post signs indicating the presence of PCB's

4) PCB Capacitors and contaminated debris should be removed from the south and west property lines to the center of the landfill. City personnel and equipment could be used to reduce cleanup costs.

5) The contaminated debris should be placed on plastic liners and covered with imprevious material (plastic liner) in the center of landfill. A cyclone fence should be constructed around this material.

6) The city should set up a notification system allowing the public to identify areas where PCB capacitors have been dumped.

7) The city should contact Indiana University for technical support in the areas of groundwater movement, migration of contaminated material, chemical analysis and general site surveys.

8) The city should require that all houses being sold have their wells tested for fecal chloroforms and PCB's.

Conclusion

In conclusion, the sink hole located at 17th Street and Monroe did not appear to be a substantial threat to the public since no capacitors were found. It is recommended that the city monitor all wells in the area for PCB's.

Tom DeFouw

Scott McCone

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE. July 15, 1981

SUBJECT Inspection at Lemon Lane Landfill in Bloomington, Indiana
June 30 and July 1, 1981

DRAFT

FROM Ron Lillich, Environmental Scientist
IL/IN Field Investigation Section

TO. William Miner, Chief
Engineering Section

THRU: John Connell, Chief
IL/IN Field Investigation Section

THRU: David Wagner, Chief
Central District Office

On June 30 and July 1, 1981, Ron Lillich of the Central District Office, along with Steve Poe of the Indiana State Board of Health conducted a sampling investigation at Lemon Lane Landfill in Bloomington, Indiana per Enforcement Division's request. The site is located on the western edge of the City of Bloomington off of Lemon Lane Road. It is in the northeast quarter of section 31 of Bloomington Township (see attached maps).

The site is composed of approximately seven acres and is owned by the City of Bloomington. It was used by the City in the fifties and early sixties for disposal of both municipal and industrial waste. According to a local resident, extensive burning of waste occurred at the site. No records were kept of the quantity or composition of waste which was disposed of at the site.

There appears to be two areas in the site which have the highest concentration of exposed capacitors. Many of these capacitors are visibly leaking oil and have contaminated the soil around them. These two areas are on the south and west sides. The south side concentration is located on the extreme edge of the site near the railroad tracks. This edge forms a sharp dropoff of approximately twelve feet with exposed capacitors scattered all along this bank. The west side concentration is located near the pasture fence. The exposed capacitors in this area are located on a more gradual slope. While surveying these two heavily concentrated areas, the investigator noted a distinct swell smell.

Capacitor insides and insulation are also scattered around these two areas. An informant stated that they use to go to this site to recover the copper bands inside the capacitors. He also stated that the capacitors were placed along the edges of the site so that the people recovering copper bands would not get in the way of the dumping operations. However, it is difficult to ascertain if the capacitors were placed just in the edges of the site or are located throughout the site. According to informant, there may yet be other sites around Bloomington where capacitor remnants may be found due to people's copper recovery operations.

No Leachate was observed coming out of the site. No springs or seeps were observed in the proximity of the site. Cattle were grazing in the pasture directly west of the site. The only surface water nearby appears to be a pond directly west of the northwest corner of the site which is used for drinking water by the cattle. There is no fence along the railroad tracks (south side) or on the southeast side of the site. Access is easily gained through these areas. Children have been reported playing in the areas of exposed capacitors. It was also observed that the City was continuing to dump tree limbs on one part of the site.

There are residences nearby which do use wells for their drinking water supply. The City of Bloomington has sampled may of the wells in the area and analyzed these sample for polychlorinated biphenyl's (PCB's) at the City laboratory. All sample results so far have shown no detection of PCB's. A copy of a map was obtained from the City showing their sampling locations and sample results.

Surveying older topographic maps, it appears that the site was located on a series of sinkholes. Surface water runoff appears to drain to the south and southwest. According to Henry Gray of the Indiana Geological Survey, groundwater flow from the site is most likely to flow to the southwest. However, since this area is characterized by karst topography, it is difficult to ascertain the direction of groundwater flow. Mr. Gray will be forwarding relevant hydrogeological information on the Lemon Lane site and also on Neal's Dump and Neal's Landfill. He will also send a detailed soil map of the area and review a 1937 aerial photograph he has of the Lemon Lane site.

The following is a description of the samples which were collected at Lemon Lane Landfill:

81CL06S01 -- This was a surface soil sample taken near the southwest corner of the site directly across the fence in a pasture where cattle were grazing. There appeared to be a depression in this area where surface water runoff would drain from the site. The sample was taken directly underneath the grass with a shovel. The sample appeared to be a dark, loamy soil. It was mixed in a stainless steel bucket and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 11 am.

81CL06S02 -- This was a one foot subsurface soil sample taken with a hand auger in the same location as S01. The sample appeared as a lighter, loamy soil. It was mixed in a stainless steel bucket and placed in a 16 oz. glas jar with an aluminium foil cap liner. 7/1/81 7:30 am.

81CL06S03 -- This was a three foot subsurface soil sample taken in the same location as S01 and S02. The sample appeared as a lighter red clay. It was taken with a hand auger, mixed in a stainless steel bucket, and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 8 am.

81CL06S04 -- This was a five foot subsurface soil sample taken in the same location as S01, S02 and S03. The sample appeared as a darker, heavier red clay. The water table was not encountered. It was taken with a hand auger,

mixed in a stainless steel bucket and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 8:15 am.

81CL06S05 -- This was a one foot subsurface soil sample taken on the south side of the site in a ditch near the railroad tracks approximately fifty yards east of where the previous samples were collected. A bank of exposed capacitors approximately twelve feet high were directly north of this area. The sample appeared as a lighter, loamy soil. It was collected with a hand auger, mixed in a stainless steel bucket, and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 8:45 am.

81CL06S06 -- This was ~~three~~ three foot subsurface soil sample collected in the same location as S05. The sample appeared as a lighter red clay. It was taken with a hand auger, mixed in a stainless steel bucket, and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 9 am.

81CL06S07 -- This was a five foot subsurface soil sample collected in the same location as S05 and S06. The sample appeared as a heavier, darker red clay. It was collected with a hand auger, mixed in a stainless steel bucket and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 9:15 am.

81CL06S08 -- This was a surface soil sample taken around leaking, exposed capacitors on the south side of the site in the middle of the bank. The soil appeared to be contaminated with oil from the leaking capacitors. It was taken with a stainless steel scoop and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 9:45 am.

81CL06S09 -- This was a surface soil sample on the west side of the site where there was another bank of exposed capacitors. It was collected directly next to the pasture fence. The soil appeared to be contaminated with oil from the leaking capacitors. It was taken with a stainless steel scoop and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 10 am.

81CL06S10 -- This was a water sample taken from a pond located approximately 25 yards west of the northwest corner of the site. This is located in a pasture which the cattle use as a source of drinking water. This was collected in a stainless steel bucket and split among an one gallon amber glass container with a teflon liner and two VOA bottles. 7/1/81 10:30 am.

81CL06S11 -- This was a sediment sample taken from the same pond as S10. It was taken with a hand auger and placed in a 16 oz. widemouth glass jar with an aluminum foil cap liner. 7/1/81 10:45 am.

81CL06S12 -- This was a well water sample from the David Foster residence at 800 Lemon Lane. The depth of the well was unknown. After a five minute purge of the well, the sample was collected in an one gallon amber glass container with a teflon cap liner and two VOA bottles. 7/2/81 10:10 am.

81CL06S13 -- This was a well water sample from the Louise Pelfree residence located at 825 Lemon Lane. The depth of the well is 85 feet. After a five minute purge of the well, the sample was collected in an one gallon amber glass container and two VOA bottles. 7/2/81 10:30 am.

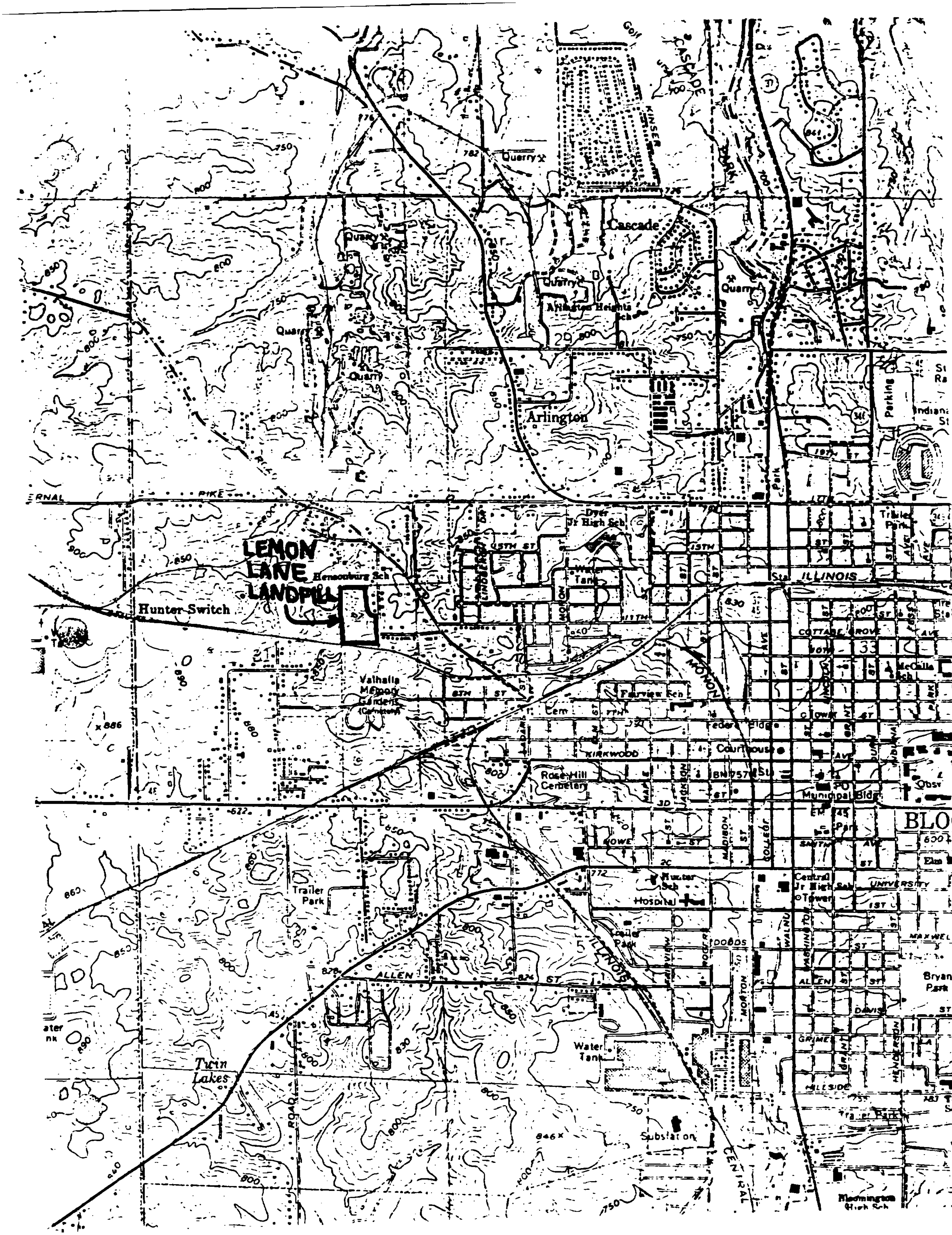
81CL06S14 -- This was a well water sample from the Reynold's residence located at 835 Lemon Lane. The depth of the well was unknown. After a five minute purge of the well, the sample was collected in an one gallon amber glass container with a teflon cap liner and two VOA bottles. 7/2/81 10:50 am.

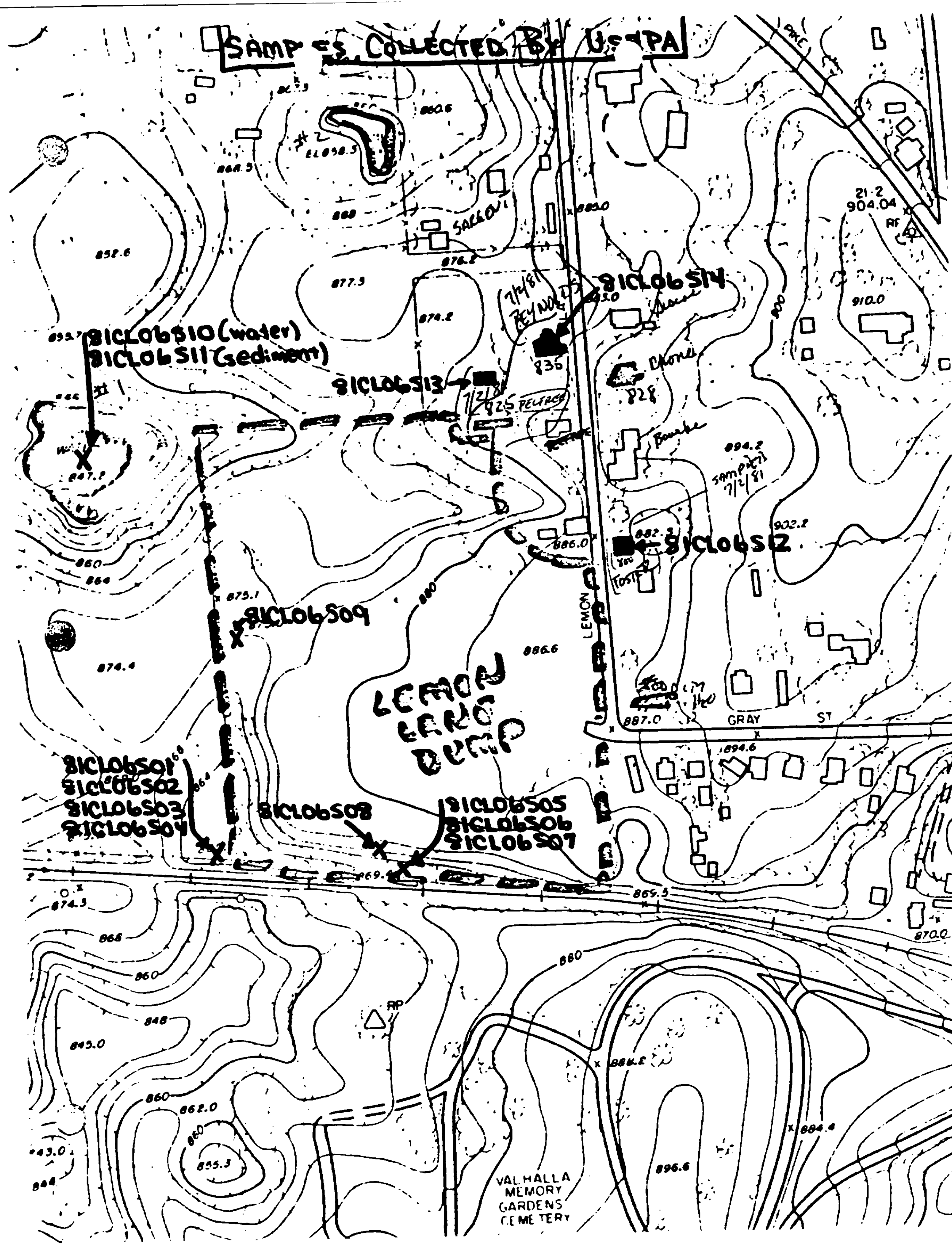
81CL06R15 -- Blank water sample collected from the CRL still. The sample was collected in an one gallon amber glass container with a teflon cap liner and two VOA bottles.

81CL06R16 -- Blank soil sample. Empty 16 oz. widemouth glass jar with an aluminum foil cap liner.

All sixteen sample are being run for a GC/MS priority pollutant organic scan. These samples are being contracted out with a projected thirty day turnabout time. Sample results should be available by the middle of August.

cc: T. Olsen, Enforcement Division
B. Magel, Enforcement Division
D. Davoli, Enforcement Division
S. Poe, ISBH


LEMON
LANE
LANDFILL
Hensonburg Sch
Hunter Switch
Cascade
CASCADE
KINSER
Arlington Heights
Arlington
Quarry
PIKE
Dyer Jr High Sch
Water Tank
ILLINOIS
MONON
Valhalla Memory Gardens (Cemetery)
Fairview Sch
Federal Bldg
Courthouse
KIRKWOOD
Rose Hill Cemetery
Municipal Bldg
COTTAGE GROVE
Central Jr High Sch
Hospital
Trailer Park
UNIVERSITY
ALLEN
ST
Bryan Park
Twin Lakes
Water Tank
Substation
CENTRAL
Bloomington High Sch
Parking
HILLSIDE


SAMPLES COLLECTED BY US EPA
81CL06S10 (water)
81CL06S11 (sediment)
81CL06S13
81CL06S14
81CL06S12
81CL06S09
81CL06S01
81CL06S02
81CL06S03
81CL06S04
81CL06S08
81CL06S05
81CL06S06
81CL06S07
LEMON LANE DUMP
LEMON
GRAY ST
VALHALLA MEMORY GARDENS CEMETERY
852.6
877.3
874.2
874.4
886.6
887.0
894.6
869.5
874.3
870.0
880
848
860
862.0
855.3
896.6
884.4
910.0
904.04
894.2
902.2
886.0
875.1
864
843.0
836
828
825

N.I. = Nore Detected

LANDFILL TESTING
CITY OF BLOOMINGTON UTILITIES LAB
JUNE, 1981

#	Date	Address/Site	PCB Conc.	Comments
1	6-26-81	2535 Vernal Pike	N.D.	
2	6-25-81	121 S. Johnson St.	N.D.	
3	6-25-81	835 Lemon Lane	N.D.	
4	6-26-81	2520 Evergreen	N.D.	
5	6-25-81	Hensenberg Creek	N.D.	
6	6-26-81	800 Lemon Lane	N.D.	
7	6-26-81	2416 Evergreen	N.D.	
8	6-26-81	Stoutes Creek soil	N.D.	
9	6-26-81	220 N. Johnson	N.D.	
10	6-28-81	825 Lemon Lane	N.D.	
11	6-28-81	215 N. Kimble	N.D.	Some Halogenated HC
12	6-29-81	211 N. Kimble	N.D.	Some Halogenated HC
13	6-29-81	3730 Stoutes Creek Rd.	N.D.	
14	6-26-81	Sargent Pond #1	N.D.	
15	6-28-81	2424 Evergreen	N.D.	
16	6-28-81	Sargent Pond #2	N.D.	
17	6-29-81	2411 Curry Pike	N.D.	
18	6-29-81	3500 Woodyard Rd.	N.D.	
19	6-29-81	828 Lemon Lane	N.D.	
20	6-29-81	315 N. Johnson	N.D.	
21	6-29-81	3701 Stoutes Creek Rd.	N.D.	

Samples are from Limon Lane Landfill - analyses done by Bloomington Utilities lab.

Samples #14 and 16 are from ponds on the N + NW side of the site. The rest of the analyses are from wells on the area.

DRAFT

MEMORANDUM

TO: File

FROM: Phil Smith
Project Manager

DATE: April 29, 1983

RE: Site Visit to Lemon Lane Landfill, Bloomington, Indiana

JOB NO: W65129.00

On April 25, 1983, Phil Smith and the following persons participated in a site visit at the Lemon Lane Landfill site in Bloomington, Indiana.

- Jack Braun - U.S. EPA
- Jackie Stecker - Indiana State Board of Health
- Tom Gilgenbach - CH2M HILL

Two vehicles were driven to the site and parked outside the east entrance gate at approximately 10:00 a.m. Protective clothing and monitoring equipment were utilized as called for in the Site Safety Plan. In addition, an HNU organic vapor analyzer was utilized. The site was classified as a level D site.

The following comments reflect the observations of the CH2M HILL members of the visitation team:

- The weather during the site visit was sunny, approximately 65°F with a light wind out of the west.
- An unlocked gate is located at the entrance to the site. The site is unfenced with the exception of the west boundary where a 4-foot barbed wire fence was erected to prevent cattle from wandering onsite.
- Exposed capacitors and interior capacitor parts were found along the south boundary and in the southwest corner of the site.
- Several foot paths were found immediately east of the exposed capacitors leading up a slope from the

railroad tracks to the site. Foot paths were also found in the northern half of the landfill.

- o Bicycle tire marks were found onsite approximately 50 feet north of the south boundary.
- o Exposed refuse, mainly large metallic items were found in the northern area of the site. No capacitors were seen in this area.
- o HNU monitoring of organic vapors throughout the site did not show levels above background.
- o Mr. Pelfree, a landowner adjacent to the site, inquired as to our purpose. Following explanation as to the team's identities and purpose, Mr. Pelfree offered information regarding the landfill from his experiences living next to the site for approximately 20 years. The following are some of his comments:
  - The area where most of the capacitors were dumped was in the large pit near the center of the site.
  - Local children routinely play in the landfill. Also, children used to scavenge copper from the capacitors. He also scavenged cooper from the capcitors.
  - Some residents in the area hunt and eat rabbits inhabiting the landfill.

o There is a definite sweet, organic odor in the south west corner.

o Pet Dogs were seen on the site

o Upon leaving, two individuals, who have law suits pending against Westinghouse, were ~~first~~ met outside the gate. They indicated that the capacitors were dumped in the center of the landfill & it was well known that people scavanged the copper & oil. Then they were building off to the side & the daily garbage was set afire.

GLT418/1

One of the guys said he mixed the capacitor oil